

## PRE-SERVICE TEACHERS' BELIEFS ABOUT SUSTAINABLE DEVELOPMENT: EFFECT OF GENDER AND ENROLLMENT TO AN ENVIRONMENTAL COURSE

### ÖĞRETMEN ADAYLARININ SÜRDÜRÜLEBİLİR KALKINMA İLE İLGİLİ İNANÇLARI: CİNSİYET VE ÇEVRE DERSİNE KATILIMIN ETKİSİ

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**ABSTRACT:** Given that academics know about the current ecological condition of the planet and about the sustainable use of the natural resources, there is an obligation for universities to become leaders in the movement to prevent global ecological collapse. Thus, determining opinions of university students in Turkey on the general awareness of sustainable development is thought to be the very first step to begin with in the way of introducing the concept of sustainability into the education strategies and this has been realized with the 334 students of Faculty of Education of the Middle East Technical University by administering environmental attitude questionnaire. Besides, the effects of gender and enrollment of environmental courses was examined. Two-way ANOVA showed statistically significant effects of these variables on participants' beliefs of sustainable developments. Results also revealed that, pre service teachers are conscious about that one of the most important solution to the environmental problems is through sustainable development and it is closely related with daily life and environment is one of the issues to be considered at the stages of industrialization and economical growth and they seem ready to make changes in their life styles to protect natural resources and they have an intention to take individual roles in solving environmental problems. The question was arisen at this point that, how the university will respond to their intention?

**Keywords:** sustainable development, pre service teachers, environmental education

**ÖZET:** Üniversitelerin ekolojik yok olmayı önleme hareketinde öncü olmaları, üniversite öğrencilerinin gezegenimizin ekolojik durumu ve doğal kaynakların sürdürülebilir kullanımı ile ilgili bilgi sahibi olmaları ile mümkün kılınabilir. Bu yüzden, Türkiye'deki üniversite öğrencilerinin sürdürülebilir kalkınma ile ilgili görüşlerinin alınması ve değerlendirilmesi, eğitim stratejileri kapsamında sürdürülebilirlik kavramının tanıtılması aşamasında ilk adımlardan biridir. Bu çalışma Orta Doğu Teknik Üniversitesi Eğitim Fakültesi'nin 334 öğrencisine çevre tutum anketi uygulanarak gerçekleştirilmiştir. Ayrıca, cinsiyet ve çevre derslerine katılımın sürdürülebilir kalkınma ile ilgili inançlara olan etkisi incelenmiştir. İki yönlü varyans analizi sonuçları bu iki değişkenin anlamlı bir etkisi olduğunu göstermiştir. Bununla birlikte, sonuçlar, öğretmen adaylarının, çevre sorunlarına çözüm yollarından birinin sürdürülebilir kalkınma doğrultusunda olduğunu, söz konusu kavramın günlük yaşam alışkanlıkları ile doğrudan bağlantılı olduğunu, endüstrileşme ve ekonomik büyüme aşamalarında çevrenin göz önüne alınması gereken önemli bir konu olduğunu düşündüklerini, doğal kaynakların korunması amacı ile yaşam tarzlarında değişiklik yapmaya hazır olduklarını ve çevresel problemlerin çözümünde kişisel sorumluluk alma eğiliminde olduklarını göstermiştir. Bu noktada ortaya çıkan soru ise, öğrencilerin bu eğilimlerine üniversitenin vereceği yanıtın nasıl olması gerektiği yönündedir.

**Anahtar Sözcükler:** sürdürülebilir kalkınma, öğretmen adayları, çevre eğitimi

## 1. INTRODUCTION

Universities have a powerful role in dealing with issues of environmental degradation and to extend their education for sustainability and changing life styles, because, as also stated by Moore (2005) universities have the potential to be leaders in research and technology, teaching and learning, and community engagement. Given that academics know about the current ecological condition of the planet and about the sustainable use of the natural resources there is an obligation for universities to become

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leaders in the movement to prevent global ecological collapse. Incorporating aspects of sustainability into higher education first begun with the signing of The Stockholm Declaration in 1972 and today many universities have recognized the importance of including sustainability education in their curriculum (Thomas and Nikita, 2002). Moreover, particularly well recognized is the Talloires Declaration (UNESCO, 1990), composed in 1990 at an international conference in Talloires, France, is the first official statement made by university administrators of a commitment to environmental sustainability in higher education which, according to University Leaders for a Sustainable Future ([www.ULSF.org](http://www.ULSF.org)), has been signed by over 250 institutions from 43 countries across the continents. The universities that sign this declaration commit themselves to operational activities and curriculum development that lead to sustainable development. More recently, in December 2002, the United Nations General Assembly adopted a resolution declaring a “Decade of Education for Sustainable Development” to begin on January 1, 2005. The UN Educational, Scientific, and Cultural Organization (UNESCO) is serving as the lead agency of this Decade, and nations are being encouraged to establish their own Decade-oriented initiatives.

As is emphasized as one of the most valid solution for the global environmental problems in the Agenda 21 and although the local Agenda 21 activities in have been gratified at the international level, sustainability education in school systems has not been held seriously yet in Turkey. Thus, considering both the conditions of Turkey as being a developing country and having young people of the number one third of the total population and one of the 8 Millennium Development Goals it is a very important challenge to help especially young people of Turkey to recognize the social, economic and cultural dimensions of the environment to achieving a sustainable future. Therefore, determining opinions of university students in Turkey on the general awareness of sustainable development is thought to be the very first step to begin with in the way of introducing the concept of sustainability into the education strategies. And the results of such a study are proposed to be promising as supplying background information for the sustainable university project in the long term.

### **Purpose**

This study was conducted to assess Turkish preservice teachers’ beliefs on sustainable development with respect to enrolment in environmental course and gender. The study focuses on the following questions:

1. What are Turkish preservice teachers’ beliefs on sustainable development?
2. Is there any significant mean difference between preservice teachers who enrolled in an environmental course and who did not, with respect to beliefs on sustainable development?
3. Is there any gender difference with respect to on beliefs on sustainable development?

## **2. METHOD**

### **2.1. Participants**

This study had been realized in the Department of Elementary Education, Faculty of Education of the Middle East Technical University. Participants of the study have been comprised of 334 students from three areas as, Early Childhood Education (ECE), Elementary Mathematics Education (EME) and Elementary Science Education (ESE). Detailed information about the participants is presented in the Table 1. Among the participants, 104 reported that they enrolled in environment related courses, while remaining indicated that they did not enroll in any environmental courses.

**Table 1.** Characteristics of Participants

Major Area	Number of students	%
Early Childhood Education (ECE)	93	27.8
Elementary Mathematics Education (EME)	98	29.3
Elementary Science Education (ESE)	143	42.8
Total	334	
<b>Year</b>		
1 <sup>st</sup> year	126	37.7
2 <sup>nd</sup> year	52	15.6
3 <sup>rd</sup> year	90	26.9
4 <sup>th</sup> year	66	19.8
<b>Gender</b>		
Girls	251	75.1
Boys	81	24.3

## 2.2. The instrument

Pre service teachers' beliefs on the sustainability concept were measured by the modified version of the 45-item Environmental Attitude Questionnaire (EAQ) developed by Tuncer Ertepinar, Tekkaya, and Sungur (2005). Twenty five items of this questionnaire used for this study for the purpose of evaluating pre service teachers' beliefs on sustainable development and on changing life styles. Selection of the items has been realized by the researchers, dependent upon their representative ability to investigate the university students' perception on the concept. The internal consistency of the scale was found to be .71 using Cronbach alpha.

## 2.3. Scoring the questionnaire

For statements representing positive attitudes toward the environment, 5 points were assigned to "strongly agree", 4 to "agree", 3 to "undecided", 2 to "disagree", 1 to "strongly disagree" and zero to "I don't know". For the presentation of the data the "strongly agree" and "agree" responses were combined to give the proportions of students who affirmed the data.

## 2.4. Analysis

Statistical analysis included frequency distributions and two-way analysis of variance (ANOVA). The independent variables were gender and the enrollment of the students to an environment course while scores of the survey constituted the dependent variable of the study. All analyses were conducted at the 0.01 level of significance.

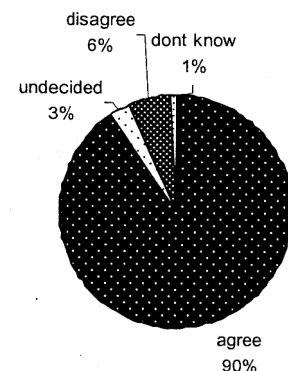
## 3. RESULTS

### 3.1. Pre-service teachers' beliefs about sustainability

Pre-service teachers beliefs on the concept of sustainable development have been realized by means of an item based evaluation and the following items were the ones that describe their beliefs in the most representative way.

*We must conserve our resources for future generations.*

More than 90 % of the pre service teachers (Figure 1) do believe in the importance of conserving resources for future generations. Since this item is one of the most pronounced definitions of the concept of



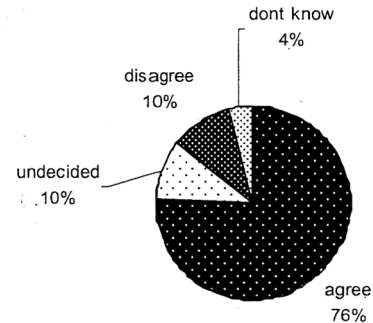
sustainability, the result obtained may be evaluated as mentioning a verbal commitment on the sustainability concept.

*We are overloading the Earth's natural ability to support life on earth.*

According to the answers they had given to this item and also according to personal communication realized by several of them, pre service teachers seem to have being confused about the meaning of the "Earth's natural ability to support life on earth".

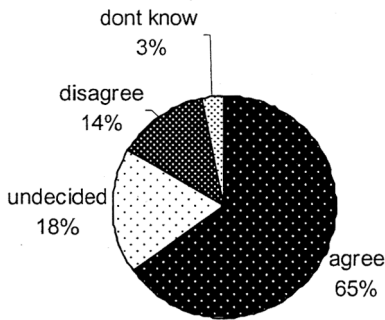
*In dealing with any kind of problem we need to first consider how it will effect the environment.*

Although 10% of them disagree and 10 % of them undecided, 76 % of the pre service teachers in the Faculty of Education - METU believe in that environment is one of the first issues to be considered in dealing with any kind of problem. Thus, teachers of the future from METU have an intention to act as taking environmental prosperities important.



*Environmental protection is more important than economic growth.*

Complementary to the above situation, although 18 % of them are undecided, 65 % of the primary and early childhood pre service teachers are in the condition to put environmental issues in front of the economic growth.

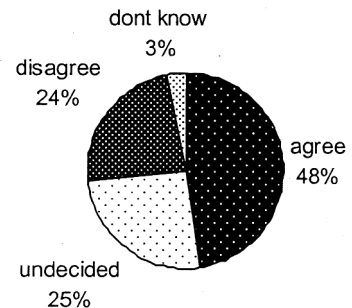


*Industrialized societies give most people who live in them a high standard of living.*

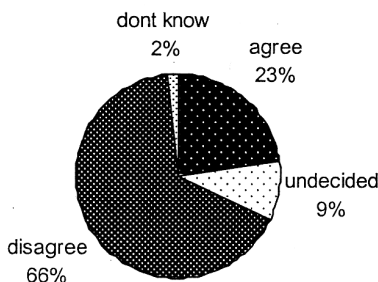
In spite of their choice for the environment over economic growth, 48 % of the pre-service teachers are agree that high standards of living come through an industrialized society, 25 % of them, on the other hand, are "undecided" about the subject.

*Environmental protection is a governmental responsibility.*

Only 23 % of the pre service teachers think that protection of the environment is a governmental responsibility. Therefore, they have an intention to take individual roles in solving environmental problems.



*Individual responsibilities are very important in protecting the environmental pollution.*

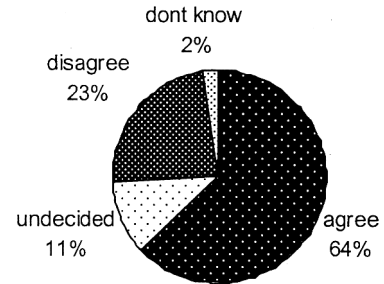
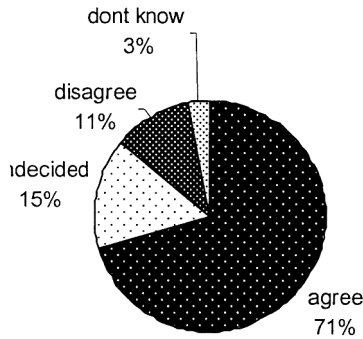


Accordingly, 91% of the pre school and primary school pre service teachers of the Faculty of Education of the METU do believe in that they have own responsibilities in protecting environmental pollution.

*The ultimate solution for environmental problems depends on drastic changes in our life-style.*

In dealing with individual responsibilities for the protection of environment, changing life styles comes as one of the most pronounced items and 64 % of the pre service teachers seem to be aware of the situation.

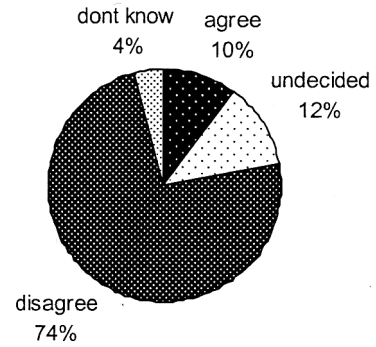
*We can accept to change our life styles to protect natural resources*



Pre service teachers do not only aware of the importance of changing life styles for the sake of protecting environment, but they (71 % ) also accept to make changes.

*Consumption patterns have nothing to do with the exploitation of natural resources*

As is stated by many of the international agencies, changes in consumption patterns and individual lifestyles for the sake of environmental protection is possible through awareness raising. The results of this study, on the other hand, revealed that 74 % of the pre service teachers of the METU think that consumption patterns are important for the exploitation of natural resources.

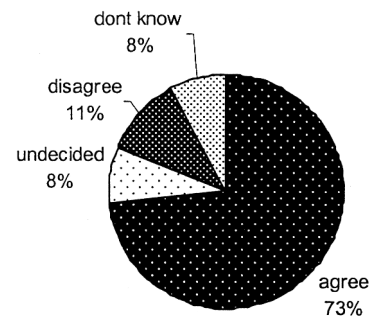
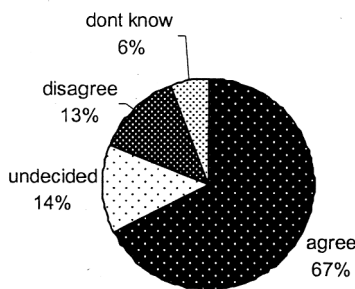


*Fast food consumption is harmful for both ours and nature's health*

As one of the patterns of consumption, fast food is defined by 67 % of the pre service teachers as harmful for both ours and nature's health.

*If we do not change the current consumption patterns, land degradation and topsoil losses will increase to the point where they can no longer support crops.*

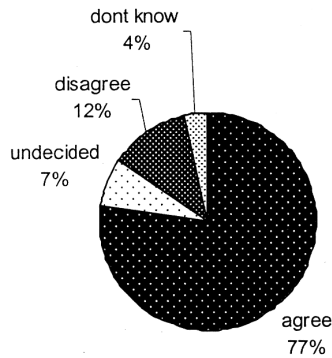
As one of the examples for the effect of consumption patterns on the exploitation of natural resources, pre-service teachers believe in that, it is possible to loose fertile top soil thus; we may have no chance to grow crops anymore.



*Turkey needs to be industrialized; therefore environmental destruction due to industrialization can be discarded.*

In spite of their belief on the high standards of living offered by the industrialized societies, 72 % of the pre service teachers prefer environmental conservation in spite of the need of Turkey to be industrialized; addressing their intention for sustainable life styles.

*The solution of the environmental problems in Turkey is closely related with raising environmental awareness.*

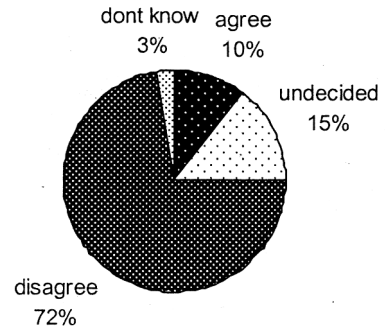


Responses to this item is very important for showing the importance given by pre-service teachers to the increase in awareness for eliminating environmental problems in Turkey; 77% of them believe in that, solution of the environmental problems in Turkey is closely related with raising environmental awareness.

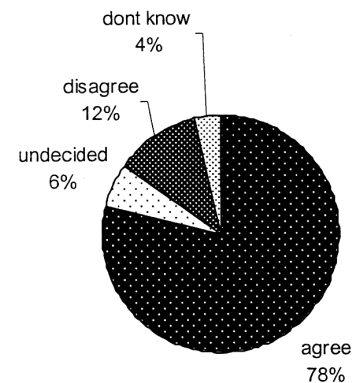
*Society should encourage the conservation of nature.*

As they believe in the importance of raising environmental awareness, pre service teachers also believe in the power of society to support the conservation activities.

Thus as the answers of 334 students of Faculty of Education of the METU revealed, pre service teachers are conscious about that one of the most important solution to the environmental problems is through sustainable development and it is closely related with daily life and environment is one of the issues to be considered at the stages of industrialization and economical growth and they have an intention to make changes in their life styles to protect natural resources.



As they believe in the importance of raising environmental awareness, pre service teachers also



### 3.2. Effect of gender and enrollment to an environmental course on pre-service teachers' beliefs on sustainable development

Preservice teachers' beliefs on the concept of sustainability have been evaluated by means of gender and enrollment to an environmental course. Two-way Analysis of Variance (ANOVA) was conducted to determine effect of these variables. A statistically significant mean difference was found between boys and girls with respect to their point of view on the concept of sustainable development ( $F(1,325)=20.63, p=0.000$ ). When the mean scores given in Table 2 were examined, it was found that girls have higher scores on the dependent variable. Therefore, they appeared to be more conscious about sustainable development. Moreover, results revealed that there was a significant mean difference between preservice teachers who enrolled in an environmental course and who did not, with respect to the awareness for sustainable development ( $F(1,325)=6.95, p=0.009$ ). Students who took environmental courses before appeared to have more conscious about sustainable development than who did not. No significant interaction was found between gender and enrolment to environmental courses ( $F(1,325)=2.67, p=0.103$ ).



**Table 2.** Descriptive statistics

	Gender				Enrollment to Environmental Courses			
	Girls (n=249)		Boys (n=80)		Students enrolled (n=104)		Students not enrolled (n=225)	
	Mean	SD	Mean	SD	Mean	SD	Mean	SD
Views on sustainable development	3.73	0.48	3.48	0.59	3.81	0.59	3.60	0.47

#### 4. DISCUSSION AND CONCLUSIONS

Pre service teachers of the METU are conscious about the concept of sustainability. they do believe in the importance of conserving resources for future generations; they are in the condition to put environmental issues in front of the economic growth; they have an intention to take individual roles in solving environmental problems; they do not only aware of the importance of changing life styles for the sake of protecting environment, but they also accept to make changes and they believe in that, solution of the environmental problems in Turkey is closely related with raising environmental awareness.

The important question at this point is that, what is offered for them by the university to realize this intention, as far as education program is considered? As the result of this study revealed, enrollment to an environment related course is a valid tool for this purpose. Considering that the mentioned environment related courses are elective ones in the METU and thus to take such courses depends on the students' area of interest, increasing number of students taking an environment related course will probably have a significant effect on increasing the university students' consciousness on the environmental problems and sustainability. There are several examples in the related literature to support this proposition.

As McMillan (2003) detected, for example, Dalhousie University's introductory environmental studies class was an effective environmental studies class that helped students' environmental values develop over the course of the year. Or, as reported by Wahlström and Kapyla (2000), an environmental education course designed for pre-service teachers in Finland affected the way environment is taught and the curricula of some training schools; they have been changed to include socially critical elements and action competence in teaching. Environmental education in the pre-service teacher education programs in the US, on the other hand, is reported by McKeown-Ice (2000) as far from preparing future teachers to effectively teach about the environment. The situation, in general, has been described very expressively by Orr (1996). As was recorded by him, despite all of the clear evidence of spreading environmental problems, the message has not made much head way in the vast majority of colleges and universities and one of the reasons for this situation is that, curriculum and research by fragments called disciplines, sub-disciplines, and departments have been organized to deal only with small pieces of the total picture. According to the author, this is fine until we need to understand patterns and whole systems, which is the business of no single discipline, department, or specialized field. Thus, larger trends and patterns tend to be ignored within a discipline-centric context. The meaning of universities to respond with "intensity and ingenuity" to the ecological challenges, on the other hand, in Orr's terms has three parts, the first one being, rethinking the foundational principles of higher education. Recognizing, for example, that all education is environmental education, meaning that students are taught in various and often unintended ways that they are part of, or apart from, natural systems. In her study realized after about 10 years later, Moore (2005) ended her study about University of British Columbia's engagement with sustainability, up with a similar result that, by creating new models of collaborative and transdisciplinary learning, the university can create structures that allow for sustainability to move from current rhetoric to reality.

In addition, when the beliefs of preservice teachers on sustainable development with respect to gender and enrolment in environmental course were examined, present study revealed that there were statistically significant effects of these variables in favour of girls and preservice teachers who previously enrolled in a course respectively. Concerning gender difference, previous research studies have shown that under certain circumstances, females express greater concern than do males (Grifford *et al.*, 1983; Worsley & Skrzypiec 1998; Eagles & Demare 1999; Tikka *et al.*, 2000; Tuncer *et al.*, 2005).

To sum up, although there are several movements to include the concept of sustainability into the university education systems and universities to become leaders in the movement to prevent global ecological collapse, Orr's (1996) comment made in 1996, is still valid for the environmental education; "As we approach the year 2000 the vital signs of the Earth are virtually everywhere in decline. The big numbers are working against us: population growth, the extinction of species, deforestation, desertification, soil loss, acid rain, toxics, and ahead, the possibilities of rapid eliminate change. But these trends need not prove fatal to the human prospect if we are able to summon the courage and the moral energy necessary to respond with foresight and wisdom. For their part, however, colleges and universities have done little to prepare their graduates to deal with the challenges ahead. The question, still unanswered, is whether they are capable of responding with "intensity and ingenuity" at all."

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**EXTENDED ABSTRACT (Uzun İngilizce Özet)**

Universities have a powerful role in dealing with issues of environmental degradation and to extend their education for sustainability and changing life styles. Because, as also stated by Moore (2005) universities have the potential to be leaders in research and technology, teaching and learning, and community engagement. There are many studies worldwide for universities to become leaders in the movement to prevent global ecological collapse. More recently, in December 2002, the United Nations General Assembly adopted a resolution declaring a “Decade of Education for Sustainable Development” to begin on January 1, 2005. The UN Educational Scientific and Cultural Organization (UNESCO) is serving as the lead agency of this Decade, and nations are being encouraged to establish their own Decade-oriented initiatives. Considering both the conditions of Turkey as being a developing country and having young people of the number one third of the total population, it is a very important challenge to help especially young people of Turkey to recognize the social, economic and cultural dimensions of the environment to achieving a sustainable future. Therefore, determining opinions of university students in Turkey on the general awareness of sustainable development is thought to be the very first step to begin with in the way of introducing the concept of sustainability into the education strategies. Accordingly, the study had been realized in the Department of Elementary Education, Faculty of Education of the Middle East Technical University. Participants of the study have been comprised of 334 students from three areas as, Early Childhood Education (ECE), Elementary Mathematics Education (EME) and Elementary Science Education (ESE). Pre service teachers’ beliefs on the sustainability concept were measured by the modified version of the 45-item Environmental Attitude Questionnaire (EAQ) developed by the authors formerly. Statistical analysis included frequency distributions and two-way analysis of variance (ANOVA). The independent variables were gender and the enrollment of the students to an environment course while scores of the survey constituted the dependent variable of the study. All analyses were conducted at the 0.01 level of significance. As a result, answers of 334 students of Faculty of Education of the METU revealed that, pre service teachers are conscious about that one of the most important solution to the environmental problems is through sustainable development and it is closely related with daily life and environment is one of the issues to be considered at the stages of industrialization and economical growth and they have an intention to make changes in their life styles to protect natural resources. Moreover, pre service teachers’ beliefs on the concept of sustainability have been evaluated by means of gender and enrollment to an environmental course. Girls appeared to be more conscious about sustainable development. Students who took environmental courses before, on the other hand, appeared to have more conscious about sustainable development than who did not. Considering these results, it is discussed that, universities should offer opportunities to their students for a sustainable future. One of the ways of realizing this might be offering environment related courses, and there are several examples in the literature on the satisfaction of such applications. But, in spite of the several examples about several movements to include the concept of sustainability into the university education systems and universities to become leaders in the movement to prevent global ecological collapse, Orr’s (1996) comment made in 1996, is still valid for the environmental education; “*As we approach the year 2000 the vital signs of the Earth are virtually everywhere in decline. The big numbers are working against us: population growth, the extinction of species, deforestation, desertification, soil loss, acid rain, toxics, and ahead, the possibilities of rapid eliminate change. But these trends need not prove fatal to the human prospect if we are able to summon the courage and the moral energy necessary to respond with foresight and wisdom. For their part, however, colleges and universities have done little to prepare their graduates to deal with the challenges ahead. The question, still unanswered, is whether they are capable of responding with “intensity and ingenuity” at all.*”