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Environmental Literacy: An Assessment and Evaluation on the Students of Landscape Architecture in Turkey

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Abstract

Environmental literacy approach, in recent years, become one of the fundamental requirements proposed for a sustainable future in higher education. Environmental literacy is the total of individual comprehension, ability, attitude and habits which are constantly in progress and it is based on that short and long term attitudes and behaviors are developed by his sustainable communication with other people and biosphere. This study aims to evaluate the environmental consciousness, knowledge and skills of the students of landscape architecture in terms of environmental literacy. As data collection tool was used Environmental Literacy Scale where the knowledge of students about environmental legislation, knowledge and behaviors is questioned. The findings reveal that students have a very limited environmental knowledge and fulfill their environmental responsibilities on an individual basis in a very restricted area. In this regard, the study, based on the research results, makes suggestions for training environmentally literate candidates in professional training of environmental by emphasizing that students of Landscape Architecture would be of low efficiency in finding creative solutions for environmental, societal and spatial problems and producing sustainable landscape since their participation is very limited in societal and mass activities.

Keywords: Environmental literacy, ecological literacy, landscape architecture education, Turkey.

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Çevre Okuryazarlığı: Türkiye'deki Peyzaj Mimarlığı Öğrencileri ile İlgili Bir Değerlendirme

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Öz

Çevre okuryazarlığı yaklaşımı, son yıllarda, sürdürülebilir bir gelecek için yüksek öğretimde önerilen temel gereksinimlerden biri haline gelmiştir. Çevre okuryazarlığı, insanların birbiriyle ve biyosferle olan iletişimlerinin tutum ve davranışlarının kısa ve uzun vadedeki geliştirilmesine dayanan bireysel anlama, yetenek, tutum ve alışkanlıkların sürekliliğinin toplamıdır. Bu çalışma peyzaj mimarlığı öğrencilerinin çevre bilinci, bilgi ve becerilerini "çevre okuryazarlığı açısından değerlendirmeyi amaçlamaktadır. Veri toplama aracı olarak, öğrencilerin çevre mevzuatı, bilgi ve davranışları hakkındaki bilgilerinin sorgulandığı Çevresel Okuryazarlık Ölçeği kullanılmıştır. Veri toplama aracı olarak, öğrencilerin çevresel mevzuat, çevresel bilgi ve çevresel davranışlar konusundaki bilgilerinin sorgulandığı Çevre Okuryazarlığı Ölçeği kullanılmıştır. Elde edilen sonuçlar, öğrencilerin çevresel bilgilerinin düşük, çevresel sorumluluklarını gerçekleştirme biçimlerinin bireysel düzeyde ve çok sınırlı bir alanda gerçekleşmekte olduğunu ortaya koymaktadır. Bu bağlamda çalışma, araştırma sonuçlarına dayanarak, Peyzaj Mimarlığı öğrencilerinin toplumsal ve kitlesel aktivitelere katılımlarının zayıf olması nedeniyle çevresel, toplumsal ve mekânsal sorunlara yaratıcı çözümler bulma ve sürdürülebilir peyzajlar üretme konularında etkin olmalarının zayıf olacağına dikkat çekerek, mesleki çevre eğitiminde çevre okur-yazar adaylar yetiştirme konusunda öneriler getirmektedir.

Anahtar Sözcükler: Çevre okuryazarlık, ekolojik okuryazarlık, peyzaj mimarlığı eğitimi, Türkiye.

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Introduction

The term 'Environmental Literacy' was first put forth by Charles Roth in 1968 (Roth 1968). Roth redefined this term many times by dealing with its various sides. Roth, stating that it is comprised of the individual's knowledge about environment, attitudes and behaviors against it in 1992, defined it later in 2002 as the combination of understanding, knowledge, skills and attitudes that enable individuals to develop very positive connection with their own environments and to do daily and long-term actions with other people and nature by having a sustainable communication in a sustainable environment (Roth 2002). Environmental literacy is basically the capacity to perceive and interpret the health of environmental systems and constitutes the important components of individual's environmental knowledge and consciousness and environmental literacy.

Environmental literacy aiming at raising productive and responsible citizens for protecting the earth and society was brought into agenda in global scale due to environmental problems reaching to global extent in 1960s. In the following years, in Stockholm Conference (1972) as the first international meeting based on environment as a result of environmental consciousness transforming into the environmental movement, environmental literacy was evaluated and the concept of environmental education was defined in the framework of environmental literacy in "Intergovernmental Conference on Environmental Education" organized by UNESCO in cooperation with UNEP and held at ministerial level in Tbilisi in 1977. Environmental education in the Tbilisi Declaration was defined as the process of individuals' education about the subjects concerning environment in order for them to gain awareness, acquire knowledge and skills, increase their motivation and attitudes for positive behaviors against environment and bringing forward ideas for the environmental problems (The Tbilisi Declaration 1977). It is believed, through this declaration, that the environmental problems could be solved through environmental education. Also, IUCN has recently drawn attention to the relationship between environmental problems and environmental education. According to IUCN (2002), the patterns of human thinking, attitudes and their habits play a leading role in generating environmental problems. Environmental literacy should be adopted as an effective approach in transforming such thoughts, attitudes and habits in favor of environment. For that reason, it is considered as the fundamental aim of environmental education (UNESCO-UNEP1989). In addition to reading and writing skills, the term 'literacy' defined as the combination of thinking, evaluation, interaction and speaking skills is today defined as acquiring "extensive knowledge" of related area in different working areas. Literacy is reading and writing skills at a level to connect with other individuals by using written and printed symbols. Today, it is also defined as well-educated and having a certain level of knowledge at a certain area (Kışoğlu 2009). Now that environmental literacy is acquiring knowledge, habits and skills and developing attitudes that enable individuals have a positive communication with environment and make it sustainable in long term (Teksöz Tuncer and et al. 2008), it is a remarkable approach that needs to be taken into consideration in environmental education.

Environmental literacy is basically related to competence on knowing (knowledge), recording (behavior) and practicing (making efforts for sustainability) (Orr, 1992). While environmental knowledge includes the extents of knowledge in order to take environmental actions (Gayford and Dillon 1995), environmental behaviors form individual emotions and the priorities for environmental responsibilities. Therefore, it plays a crucial role in displaying environment-friendly behaviors (Pe'er, Goldman &Yavetz, 2007). In some scientific research looking into the relationship among knowledge, attitude and behavior, there is a correlation between knowledge-attitude, knowledge-behaviour, attitude-behavior whereas there is no correlation in some other research (Cheng & So, 2014).

Educational institutions are the very places for increasing environmental literacy. The main purpose of these institutions is to raise students as productive, conscious and responsible individuals for society and prepare them for citizenship. So, the education system and cycles at educational institutions should be in a position to support and develop the students' personal, professional and societal skills, actions and perceptions (Roth, 1992). High literacy rate in a society signifies that individuals understand how natural systems work out on the earth, what kind of effects human activities have on this system and their connections and that they have practical (applicable) knowledge of the related subject. The practical knowledge related to the system enables individuals to

develop their competencies of problem recognition, evaluation, knowing personal responsibilities and taking precautions, and also it will help them to develop an attitude for the use of natural sources and the decrease of environmental problems (Teksöz Tuncer and et al., 2008). Such attitudes are expected to develop especially among young people. From this point forth, one of the recent subjects at issue is environmental education at higher educational institutions (Moody et al., 2005; CELP, 2005; Kaplovitz & Levine, 2005). Those who gain expertise after their university graduation are expected to take active roles in their societal or professional lives and take their environmental knowledge, skills, attitudes and values gained during their university education to their circles (Teksöz Tuncer and et al., 2008). For example, the shared objective of the studies investigating the environmental literacy in the USA is to assess the level of environmental knowledge of the university students and to help the graduate students to grasp and develop environmental policy. In Canada, environment is an interdisciplinary subject and it is put forth that students, regardless of their majors, are supposed to be environmentally literate. In these countries, especially in the studies related to sustainable development, it is aimed to assess environmental literacy and determine the efficiency of sustainable development and environmental education (Thomas & Nicita 2000, Moody et al., Teksöz et al., 2010). These examples show that higher educational institutions adopt it as a principle to graduate students whose environmental knowledge, attitudes, behaviors and values have been developed and who can relate their professions with the environmental problems and care about the rights of future generations to live (Teksöz et al., 2010).

The pattern how natural sources are used has been one of the most significant environmental problems in Turkey in recent years. Because Landscape Architecture professional discipline is one of the planning discipline professions taking care of the planning and use format of natural sources, assessing the environmental literacy of the students majoring in Landscape Architecture and developing professional discipline considering the results obtained may contribute a lot to the position of the profession. In this regard, it will be beneficial to determine the level of environmental literacy among the students majoring in Landscape Architecture and to question the relationship between this level and learning plans.

Landscape Architecture profession is of a special feature since it requires an extensive knowledge in the areas of natural sciences and visual creativity. Landscape architecture is also of a creative attitude that helps it to define what it has understood from the world as well as solving spatial problems. Dealing with spatial problems requires knowing about societal needs and social structure. Because of this structure, it is interdisciplinary and complex (Gazvoda, 2002). The heavy increase in the world population, fast global urbanization, non-convertible and large-scale industrialization destroy environment and harm ecosystems and landscapes. The continuity and development of sustainable landscapes is one of the hardest and most important tasks of stakeholders and scientists. In fulfilling this task, landscape ecology and landscape architecture play a critical role. Landscape architecture is supposed to know societal needs to realize this critical role. Increasing environmental knowledge, developing environmental attitude, behavior and responsibility and participation in environmental activities/actions are required in order to succeed in knowing about societal needs and solving environmental problems.

This study was carried out to investigate the environmental knowledge, attitude and behaviors of Landscape Architecture students within the scope of environmental literacy scale. The level of environmental literacy of students aims to help understand the basic inadequacies of professional education. Also, it enables to discuss the attitudes to be developed for a sustainable landscape in the planning discipline in Turkey.

Method

With reference to the possibility of various approaches of Landscape Architecture departments affiliated to different faculties, the study was carried out by using the questionnaire form and technique based on environmental literacy scale at the Faculty of Architecture (Istanbul Technical University), Faculty of Agriculture (Ankara University) and Faculty of Forestry (Bartın University).

The environmental legislation, knowledge and attitudes of students were questioned by developing environmental literacy scale (Teksöz Tuncer et al., 2008; Teksöz et al. 2010). The

environmental literacy questionnaire form consists of four sections: demographic information, institutional and environmental legislation information related to environment, environmental knowledge test and environmental behavior pattern.

Research Sample

A total of 90 students were interviewed from Istanbul Technical University (ITU), Ankara University (AU) and Bartın University (BU); however, the responses of 87 students were processed in the questionnaire. 50%.6 (44 students) of them were from BU Faculty of Forestry, 26.4% were from AU Faculty of Agriculture and 23% (20 students) were from ITU Faculty of Architecture. While 67.8% of the students were female, 32.2% were male. The distribution of the students according to their grades is as follows: 1st grade: 16.1%; 2nd grade: 17.2%; 3rd grade: 34,5%; 4th grade: %26,4 and above 4th grade: 5.7%. The age of 10.3% ranges from 15 to 20, 89.9% are between 21 and 25 years old and 5.7% were aged 26-30.

Data Analysis

Data was assessed via factor analysis and frequency analysis in the software IBM SPSS Statistics 22. In accordance with the numerical values from the analyses, the environmental knowledge, attitudes and behaviors of students studying Landscape Architecture were evaluated. Likert Scale was used to assess the environmental literacy of these students. The responses under this section were made numerical in ordinal scale.

Results

Cumulative Grade Point Averages (CGPA) of 37.9% of the respondents are under 2.00; 29.9% is of 2.50-3.00 CGPA and 21.8% is of 3.00-3.50 CGPA. 73.6% of Landscape Architecture Students put forth that their professional discipline is architecture, 21.8% suggested it is natural sciences. Only 2.3% stated that it is agriculture and 2.3% said that it is closer to botany. 28.4% of them also stated that they were a member of the Student Branch at the Chamber of Landscape Architecture.

Environmental Legislation and Specialized Knowledge

65.5% of students know National Parks Law, 62.1% have the knowledge of Environmental Law and 52.9% of them know Construction Zoning Law. However, those who know about Cultural and Natural Heritage Preservation Law, Coastal Law, Forestry Law and Soil and Land Protection Law are below 50%. Although a high rate of the students knows National Parks Law, they stated that its importance is low in terms of their profession. They suggested that the most important law is Environmental Law for a Landscape Architecture. Because of the low level of their knowledge about Soil and Land Protection Law (%66.7), they did not see it is a significant law (Table 1).

Table 1

Frequency Analysis of Professional Legislation Knowledge Questions

Significant (%)	***Not significant (%)***	***Laws***	***I have knowledge (%)***	***I do not have knowledge (%)***
8	10.3	National Parks Law	65.5	34.5
66.7	8	Environmental Law	62.1	37.9
6.9	2.3	Construction Zoning Law	52.9	47.1
8.0	9.2	Cultural and Natural Heritage Preservation Law	49.4	50.6
3.4	29.4	Coastal Law	48.3	51.7
4.6	8	Forestry Law	43.7	56.3
2.3	32.1	Soil and Land Protection Law	33.3	66.7

Environmental Knowledge

The rate of correct answers for environmental knowledge questions is 57.04%. More than 90% of the students answered the biological diversity question (Q21) correctly. They stated that the most serious reasons for air pollution (Q22) are factories and work places (69%). Except for the correct answer, which power generation is provided through hydroelectric power plant (Q23), they also answered 'petrol-coal and wood burning' (20.7%) and nuclear plants (19.5%). While the rate of those who gave correct answers for the reasons of river and sea pollution was high, they alternatively stated that the municipal waste is the secondary reason. The question of renewable source (Q25) was answered correctly by 55% of them and 21.8% showed iron mine as a renewable source. The correct answers for the question about the functions of ozone layer are above 50%. Among the other responses are global warming (19.5%) and acid rains (11.5%). More than 95% of the respondents gave wrong answer to the question related to the 'waste control' (Q27). 49.4% expressed that the waste is delivered to recycling centers and 29.95 expressed it is thrown into sea. Those who responded that the official body making environmental protection decisions (Q30) is either TEMA or Turkey Environmental Protection Foundation were 19.1%. While 72.4% of them responded correctly that the most harmful domestic waste (Q29) was batteries, 21.8% indicated it as plastic package. Apart from the correct answer, 9.2% of the respondents pointed out that the most common cause for animal species extinction (Q30) was the increasing hunting rate. The rate of those who were unaware about the method of nuclear waste storage was 36.8% (Table 2).

Table 2

The Frequency Analysis of the Questions about Environmental Knowledge

	Questions	Correct Answer	The rate of correct answers marked (%)
Q21	There exists a variety of animal and plant species in different environments. Which term is used the best to define it?	Biological Diversity	90.8
Q22	Carbon monoxide is a serious air pollutant in Turkey. Which of the following is the most serious carbon monoxide source?	Motor vehicles	28.7
Q23	How is electricity power generated to a large extent in Turkey?	via hydroelectric power plants	48.3
Q24	Which one is the leading cause for river and sea pollution in Turkey?	Untreated domestic, industrial and agricultural waste	83.9
Q25	Which of the following is a renewable source?	Trees	59.8
Q26	Ozone is a protective one among the top layers of the atmosphere. Which of the following does it protect us from?	Harmful sunlight causing cancer	54.0
Q27	Where is the majority of waste collected?	Landfills	3.4
Q28	Which is the official body to make environmental protection decisions in Turkey?	Ministry of Environment and Urbanization	67.8
Q29	Which of the following can be considered as a harmful domestic waste?	Batteries	72.4
Q30	Which of the following is the most common cause for animal species extinction?	Habitats are destroyed by human beings.	78.2
Q31	The scientists have not successfully concluded the studies for nuclear waste storage. Which is the most common method of nuclear waste storage now in the world?	It is stored and kept under control	40.2

Environmental Attitude and Behavior

In this section where how well, their environmental attitudes have developed at a level of participation, it was evaluated the students' attitudes about liaising (organizational behavior) and cooperationwith the community as well as their individual attitudes.

Table 3

Developing Environmental Attitude

	Statement	Always (%)	Often (%)	Sometimes (%)	Rarely (%)	Never (%)
Q11	I attend the scientific studies such as seminars, panels or conference about environment	6.9	28.7	54	10.3	0
Q12	I follow the activities of voluntary agencies about environment (e.g. TEMA, Society for the Protection of Nature)	6.9	24.1	46	21.8	1.1
Q13	I discuss with my friends about how to protect environment and take precautions	10.3	24.1	43.7	19.5	2.3
Q14	My family and I exchange opinions about protecting environment and taking precautions for it.	18.4	24.1	35.6	16.1	5.7
Q15	I throw waste in the bin suitably at school or home, on a picnic or street.	74.7	16.1	2.3	4.6	2.3
Q16	I warn people to throw waste in the bin suitably at school or home, on a picnic or street.	44.8	34.5	9.2	10.3	1.1
Q17	I throw waste such as paper, glass, plastic, can, metal or battery in recycle bin	27.6	35.6	19.5	16.1	1.1
Q18	I prefer using recyclable products or the products from recycled materials (like buying products with recycling symbol on it)	14.9	23.0	46.0	13.8	2.3
Q19	I do not harm plants and also warn people not to do so (e.g. breaking tree or plant branches, picking flowers or grass).	52.9	29.9	13.8	2.3	1.1
Q20	I follow signs or signboards about protecting environment or nature	48.3	35.6	9.2	6.9	0.0

According to the students' responses, 30.57% of the students always participate in the collective activities and discuss about it while 27.57% participants do them often. The rate of those who sometimes take role in them and discuss about it is 27.93%. Rarely do 12.17% of them participate while only 1.7% of them never participate (Table3). About 45% and over have developed an individual attitude but it is seen that the option "sometimes" is predominantly marked for the related questions about attending scientific meetings (Q11), attending NGOs' activities (Q12) and preferring recyclable products (Q18). Such rates show that individual attitudes have not been able to become communal and they display their developing awareness in a restricted area (inner or friend circle etc.) (Table 3).

Table 4

The Frequency Analysis of the Questions about Environmental Behavior

	Statement	Strongly agree(%)	Agree (%)	Somewhat agree(%)	Disagree (%)	Strongly disagree (%)
Q1	I care about protecting environment.	73,6	21,8	3.4	0.00	1.1
Q2	I want those around me to protect environment.	44.8	39.1	14.9	0.00	1.1
Q3	I consider myself environmentally-conscious (Consciousness means having positive feelings about environment)	42.5	34.5	21.8	0.00	1.1
Q4	I frequently read documents, **books** about environment and nature.	14.9	17.2	51.7	16.1	3.4
Q5	I frequently read documents, newspapers about environment and nature.	13.8	27.6	48.3	8.0	2.3
Q6	I frequently read documents, magazines about environment and nature.	11.5	32.2	36.8	17.2	2.3
Q7	I always watch programs about environment and nature on TV.	21.8	37.9	29.9	9.2	1.1
Q8	I think that I should do something for natural habitats	43.7	36.8	17.2	1.1	1.1
Q9	I am personally responsible for preventing environmental pollution	57.5	31.0	9.2	0.0	2.3
Q10	I encourage people to take actions in order to protect environment	32.2	39.1	27.6	0.0	1.1

The students consider that they care about environmental protection, they warn people about protecting environment and encourage them to take actions for it, they feel responsibility for environmental pollution and think that they should take actions to protect habitats. However, they say that they are partly interested in the newspapers, magazines, written documents, books or documentaries about environment and nature (41.6%). The responses to the positive statements in the environmental attitude section are as follow: Strongly agree: 36.01%; Agree: 30.9%; Somewhat agree: 25.91%; Disagree: 5.73%; Strongly disagree: 1.75% (Table 4).

Table 5

Responsibility Factors and the Variance Values Related to Factors

Factor	**Questions about individual responsibility**	**Factor weight**	**Variance value**	**Factor loading**	**Cronbah 's Alpha**
Factor 1 Follow-up with visual/print media	Q6_ I frequently read documents, magazines about environment and nature.	,857	43,834	4,383	,857
	Q4_ I frequently read documents, books about environment and nature.	,850			
	Q5_ I frequently read documents, newspapers about environment and nature.	,836			
	Q7_ I always watch programmes about environment and nature on TV.	,641			
Factor 2 Individual responsibility	Q1_ I care about protecting environment.	,693	12,559	1,256	,748
	Q9_I am personally responsible for preventing environmental pollution	,680			
	Q10_I encourage people to take actions in order to protect environment	,668			
	Q2_ I want those around me to protect environment.	,638			
	Q8_ I think that I should do something for natural habitats	,514			
	Q3_ I consider myself environmentally-conscious	,510			

KMO and Bartlett's Test: ,827; Bartlett's Test of Sphericity Sig.:000

The responses in the section of environmental behavior and environmental attitude were evaluated by factor analysis. The factor accounts for 56.393% of the total variance. The follow-up with the visual/print media (factor 1) is of the highest variance and accounts for 43.834% of the total variance. While follow-up with the visual/print media is comprised of 4 components, individual responsibility (factor 2) is of 6 components and accounts for 12.559% of the total variance (Table 5). Considering the variance values of the factors, we see that the students have a weak attitude to fulfill the individual responsibility.

Participation and consciousness: In the analysis which is aimed to determine the students' participation in environment activities and consciousness about them were obtained three factors: Abiding by environmental rules (factor 1), expressing opinions and participation in the environment groups that have opinions (factor 2) and product preference and scientific follow-up (factor 3). These factors account for 60.574% of the total variance (Table 6).

Factor 1 (abiding by environmental rules) accounts for 29.904%; factor 2 (expressing opinions and participation in the environment groups that have opinions) accounts for 19.367% and factor 3 (product preference and scientific follow-up) accounts for 11.304% of the total variance. When analyzed the variance values of the factors, the students are seen to be primarily weak at following up with the scientific activities and preferring recycle products and secondarily weak at expressing personal opinions about environment. They are seen to be more active only in fulfilling individual responsibilities.

Table 6

Participation and Consciousness Factors and Variance Values Relating to the Factors

Factors	Participation Questions	Factor weight	Variance value	Factor loadings	Cronbah's Alpha
Factor 1 Abiding by environmental rules	Q15_ I throw waste in the bin suitably at school or home, on a picnic or street.	,815	29,904	2,691	,697
	Q20_ I follow signs or signboards about protecting environment or nature	,766			
	Q19_ I do not harm plants and also warn people not to do so	,758			
Factor 2 Expressing opinions and participation in the environment groups that have opinions	Q13_ I discuss with my friends about how to protect environment and take precautions	,799	19,367	1,743	,666
	Q14_ My family and I exchange opinions about protecting environment and taking precautions for it.	,759			
	Q12_ I follow the activities of voluntary agencies about environment	,673			
Factor 3 Product preference and scientific follow-up	Q18_ I prefer using recyclable products or the products from recycled materials	,789	11,304	1,017	,554
	Q17_ I throw waste such as paper, glass, plastic, can, metal or battery in recycle bin	,683			
	Q11_ I attend the scientific studies such as seminars, panels or conference about environment	,597			

KMO and Bartlett's Test: ,697; Bartlett's Test of Sphericity Sig.: ,000

Conclusion and Discussion

In this study, it was determined that the students of Landscape Architecture adopt the behavior of individual responsibility rather than the communal/organizational one about the environmental problems and they show this kind of behavior more in a relatively restricted area than in public space. Moreover, the claims that the profession of landscape architecture is interdisciplinary, creative, communal and spatial do not overlap the results that the students have a weak knowledge of environment; they do not have a good command of environmental legislation and institutions related to environment.

Ignorance of legislation brings it to a halt to claim the rights to solve environmental problems. It should be considered as a serious problem that they are unaware of the laws related to land and soil use since it is a professional discipline about "soil" itself. What is more, given that it is becoming more difficult to save soil and farm lands because construction and building trade is the main sector in Turkey, it could be thought that the problem will cause many ecological problems (e.g. disruption of biochemical cycles or a negative progress of design-process interaction). Although the unprotected soil and farm lands are on the agenda of local and national press, not only does it affect the sustainable management of landscape in a negative way that the students have a very limited knowledge of related law and they consider it unimportant according to the professional perspective, but also it leads to a weak role of landscape in the planning policy of its profession.

For a sustainable management of landscape, it is necessary to know about social problems and needs, to work collectively on a common ground and increase environmental consciousness and participation. No matter how effective their participation and consciousness about environment in their family or friend's circles, they do not attend mass or scientific meetings. The main reason for this might be a matter of self-confidence about the adequacy of knowledge in the related subject. It could be inferred that educational system of landscape architecture fails short to create informal environment (museums, protected areas, streets, NGOs etc.) due to the fact that they have lack of environmental knowledge and they are conscious about environment and participate in the related subject in a more limited circle (while with friends and family). The students could have problems knowing social, communal and ecological environments because of the fact that they spend more time with technological devices and prefer nature and recreation activities less than before due to the technological advancements and computer age. And so, they may refrain from reacting the trouble that occurs in such places. Therefore, science in landscape architecture education is not merely phenomenon to be taught in a formal setting (e.g. inside the school buildings) and it should continue in informal settings, as well, because it is known that open minded, participatory, concerned and volunteer individuals are raised in informal environments.

Simmonds (1995) identifies the components of environmental literacy under seven headings (McBride, 2011): Affect, ecological knowledge, socio-political knowledge, environmental issues, cognitive skills, environmentally responsible behaviors and additional determinants of these behaviors.

The main reason why the students do not take actions is related to the framework of landscape architecture education. Landscape architecture education has been continuing in the way it started in 1980s and has failed to adopt itself to the date.

Landscape architecture education is carried out in the framework of a program which is of intensive courses aiming to teach designing and 3D (three dimensional) skills but is short of theoretical courses. They hardly ever take theoretical courses and very few of such courses are supported with selective courses. In the first grade, the studio courses starting with design and drawing courses are succeeded by landscape design courses in the following grades and landscape planning course in the last grade. In the studio courses that are supposed to be about theoretical knowledge, no theories or policies are taught but physical planning are rather emphasized. As a result of emphasizing only physical planning, the students are unaware of why they are doing what and what they defend or protect. Moreover, they are fall short to understand the relationship between design and planning because they do not work mainly on urban scale to produce and develop major planning

decisions. It is naturally impossible that the students have a discourse or take actions in these studios without the theories and policies of design and planning.

In our age, it will only be possible to produce strategic decisions through the required analysis and synthesis about the subjects such as the protection, restoration, wise use, planning and management of natural and cultural sources as long as we train landscape architects having "operational environmental literacy".

In the education of landscape architecture professional discipline, a system planning should be taken into consideration rather than physical planning in order to train "operational" environmental literate candidates. It is crystal-clear that theory and practice should be attached importance so that a shared program could be developed in Landscape Architecture professional education, taught at different faculties in Turkey, and the program would be at international standards. Moreover, landscape design and landscape planning practices should be integrated into the curriculum, which will enable the students to develop environmental attitude, behavior and cognitive skills. Besides, it will also help the students to have attitudes and behaviors for making decisions, taking actions and sharing responsibilities that the courses which will develop their skills to set up projects and support them are incorporated in the curriculum.

Compared to the teaching plans at the universities in the Far East, the USA and European countries, it is seen that those in Turkey, which have the program of Landscape Architecture, have different approaches. The education in these parts of the world is of critical teaching and thinking methods although it is impossible to pronounce that a specific method is adopted in Turkey, moreover education in Turkey is shaped based on ideological thought.

Today, the students graduate from the university without a sufficient experience about the specific conditions and problems of practices because the infrastructure to build the continuity of education and practice in the education of landscape architecture is not developed sufficiently. Especially the knowledge of bureaucratic processes and legal infrastructures is not included sufficiently in the educational periods. Such problems are substantially based on that the educational and practical processes are determined independently of each other, teaching programs do not handle the problems and expectations of the practice periods as a direct input and the relationship between the university and occupational groups are restricted (Güzer, 2000; Demiroğlu et al., 2015). 54.88% of the students, a high rate, agreed on the following statement: "My traineeship did help me gain the ability to determine, express and solve the problems related to my profession". 17.07% of these students strongly agreed with this statement. Only 8.94 stated that they did not agree on this. The rate of the students who somewhat agree is 10.94%. More than half of the students (55.69%) said that the traineeship contributed to their perception of the global, environmental and social effects of the solutions related to their profession while 18.70% did not agree on this. The rate of those who strongly disagreed on it was 8.94% and those neither agree nor disagree on this statement were 19.67% (Demiroğlu et al., 2015).

As well as understanding the relationship between continuity and health of ecosystem and life, one should also have the scientific knowledge of and evaluate the potential risks by using this scientific knowledge. It is known that flow of information is provided though media in Turkey. Given that almost no programs are broadcast in media about ecosystem, impact-result, ecological systems and related processes, it is a natural and expected result that the rate of environmental literacy is low for students. However, it is another problem that educational system could not solve this problem. Ecology is an area that includes dynamic and complicated processes. Therefore, it is a debate that what kind of knowledge it should be based on and how the priorities should be determined. But formal and informal learning techniques should be utilized in company so as to create synergy in education. It is obligatory for Landscape Architecture professional discipline to consider a course program based on environmental and ecological literacy.

The environmental part covers more than the resource consumption. For this reason, the context that is formed by cultural reproduction is of a significant impact on supporting the human rights, the power of proving their own existence and the connection with others. It is the context that allows the link between humanity and nature (Ammar, 2003). In the analyses made, on the other hand, it is seen

that informal education, which suggests no political infiltration in terms of agency and stance against, is more effective. It is clear that formal education, as Hegel suggests, highly attests the need for educating the educators. Moreover, rote-learning based education rather than one that offers critical thinking raises only individuals with diplomas instead of those with the ability of thinking. On the other hand, no perception has grown or been developed that planning space and nature is a political area. Spatial planning is a political activity because related departments and their instruments constantly intervene with space. Thus, space is not an object that is dissociated with politics or ideology. It has always been politicized and strategic because it is the united form of historical and natural components (Lefebvre, 2009). As Harvey (1997) points out, spatial forms are not inanimate objects and it should be seen as a whole with the social process. The fact that Landscape Architecture in Turkey is offered under several faculties at universities, the failure to coordinate among the curricula and the state of "inertia" in education may hinder not only the students' motivation of learning but also developing a professional vision and mission.

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