

Importance of Ecological Awareness in Sustainability: Example of Siirt University Faculties of Agriculture and Education

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Abstract— *The change of lifestyles and the increase of environmental / ecological problems from day by day are the important issues on a global scale. Developing the ecological awareness of the individuals who are commonwealth is an important step in solving these problems. For this reason, today, almost every stage of education of the new generation (from kindergarten to university) is given importance to ecological knowledge and it is tried to transfer this knowledge to life styles. The aim of this study is to determine and compare ecological awareness levels in undergraduate departments with ecology education and to evaluate the change of this awareness according to socio demographic characteristics. For this purpose, an ecological awareness survey was applied to 209 students who received undergraduate education at the Faculties of Agriculture and Education at Siirt University. The survey results were analyzed with SPSS (Statistical Package for Social Sciences) 20.0 package program using t-test and ANOVA test. According to the results of the analysis, there was no significant difference between the two faculty students in terms of ecological awareness. . In other words, according to the survey results, there is an ecological awareness in both groups. . But this awareness does not make a difference between each other. The results obtained from the research reveal the importance of ecological awareness and living with ecological consciousness for the solution of problems such as environmental problems, damage to nature and limited natural resources.*

Keywords— *sustainability, environment, ecological awareness, faculty of agriculture, faculty of education, Siirt University*

I. INTRODUCTION

Since the existence, human provided everything from the nature and has lived as part of the nature. Over time, reasons such as the advancement of technology and population growth have pushed people to tend to dominate nature and shape it in line with their wishes and needs. This situation has caused nature to change by human hands over time. Nature has been rapidly destroyed and problems have begun to arise.

With the realization of this situation, human tried to compensate for the destruction he gave to nature and the environment by using the technology he produced. But most of time this has not been possible. Environmental problems such as pollution of air and water, decreasing water resources, gradual disappearance of plant and animal species, and degradation of nature have caused people to pay more attention to this issue. As a result, a number of national and international organizations were established,

agreements were signed and new policies started to be produced. In addition, environmental education has been started for children and young people, - from pre-school education to the end of university education- , in order to increase ecological knowledge

and awareness. How much natural resources are used by humans has gained an even more measurable quality with the concept of ecological footprint. In this context, creating ecological awareness has become an important environmental education tool in raising individuals with conscious consumer identity. There are national [1, 2, 3, 4, 5, 6, 7, 8] and international [9, 10, 11, 12, 13, 14, 15, 16, 17] studies on this subject.

The aim of this study is to determine the ecological awareness levels of the students who have ecology education in the example of the Faculty of Agriculture and

Education of Siirt University, to determine the levels of ecological awareness and to evaluate them comparatively.

II. MATERIALS AND METHODS

2.1. Material

The main material of the study consists of survey answers of 127 students who have undergraduate education at Faculty of Agriculture and 82 students who have undergraduate education at the Faculty of Education of Siirt University. The common feature of all these students

is that they have taken or are taking ecology lessons during their undergraduate education. The survey consists of two parts. In the first part, there are questions about demographic features. In the second part, there are questions about ecological awareness (Table 1). In addition, relevant articles, theses, reports and other written / visual sources were used as materials.

Table 1. Survey questions [18]

	Absolutely I agree	I agree	Undecided	I do not agree	I strongly disagree
1					
2					
3					
4					
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22	I do not leave technological tools such as television and computers unnecessarily open.
23	I do not operate appliances such as dishwashers and washing machines before they are full.
24	When I am not at home for a long time, I turn off the boilers and heaters etc.
25	I do not leave electrical appliances such as phones and computers on charge for a long time.
26	It is beneficial for the environment to make public buildings and houses where the solar energy (light and heat) is used.
27	When I do not use electrical devices such as computers, televisions, music players, I do not keep it in sleep mode, I turn it off completely.
28	If possible, I recycle old / scrap electronic devices (electronic waste), batteries, batteries, etc.
29	I prefer to pay my bills on the internet, as it will save paper.
30	I can recycle recyclable domestic wastes from waste, and recycle them if possible.
31	I don't throw the leftover food in the trash.
32	I prefer a reusable cloth bag, net or basket instead of plastic bags that are used once in shopping.
33	I think that it is more beneficial for the environment to evaluate plastic coated and decorated goods in different ways by not disposing the packaging.
34	I prefer rechargeable ones when buying batteries.
35	I separate packaging wastes (glass, tin, plastic, paper) and I try to recycle them.
36	If house cleaning is not necessary, I prefer wiping instead of washing.
37	I do not use cleaning materials more than necessary.
38	In terms of water saving, I think that the toilet flushes with dual structure should be used according to the small ablution-large ablution separation.
39	To avoid wasting water, I do not operate the dishwasher and washing machine before it is full.
40	Methods such as limiting the shower time, turning off the water while brushing teeth, shaving, not washing the car with a hose, and reducing carpet washing in homes save water.

2.2. Method

The ecological awareness scale developed by Coskun [18] was used in the research method. In the second part of the survey, the ecological awareness part, the scale consists of five factors. Variance explanation rates of the factors: energy is 10.9%; waste is 9.41%; food is 9.17%; water consumption is 7.65% and transportation and shelter is 6.28%. The total variance rate is 43.42% [18]. The internal reliability alpha coefficients of the factors are: Energy 0.90, Waste 0.90, Food 0.89, water consumption 0.79, transportation and accommodation 0.89. The 5-point likert rating (1 = strongly disagree, 5 = strongly agree) consists of 40 expressions. 8 of the statements are "Food", 6 are

"Transportation and shelter", 13 are "Energy", 8 are "Waste" and 5 are "Water consumption" sub-dimensions. The minimum score that can be obtained from the whole scale is 40 (40 x 1) and the maximum score is 200 (40x5). A high score indicates a high level of awareness. The data obtained from the questionnaires were analyzed in SPSS 20.0 package program. In this context, firstly, Cronbach Alpha reliability test and Skewness - Kurtosis tests were performed to the questions. Then, t-test and one-way ANOVA test were applied to the data obtained, and the Tukey test was chosen as the post-hoc test.

III. RESULTS

3.1. Demographic Features of Participants

The demographic characteristics of the participants studying at Siirt University Faculty of Agriculture and participating in the research are given in Table 2. Accordingly, 43.3% of the participants are women and 56.7% are men. 15.0% of them spent most of their lives in villages and towns, 20.5% in districts, 43.3% in cities and 21.3% in metropolitan cities. The monthly expenditure of 15.7% of the participants is 0-500 TL, the monthly expenditure of 41.7% is 500-1000 TL, and the monthly

expenditure of 32.2% is 1500 TL and above. The mother of 62.2% of the participants graduated from primary and secondary schools, 10.2% from high schools, 3% from undergraduate and graduate degrees. The rate of illiterate mothers is 24.4%. The father of 53.5% of the participants graduated from primary and secondary schools, 23.6% from high schools and 13.4% from undergraduate and graduate degrees. The rate of illiterate fathers is 9.4%.

Table 2. Demographic characteristics of the participants studying at Siirt University Faculty of Agriculture

Demographic characteristics	Parameters	Frequency	Percentage
Gender	Female	55	43,3
	Male	72	56,7
The longest lived place	Village	19	15,0
	District	26	20,5
	City	55	43,3
	Metropolis	27	21,3
Monthly average expenditure	0-500 TL	20	15,7
	500-1000 TL	53	41,7
	1000-1500 TL	13	10,2
	1500 TL and above	41	32,2
Mother's educational status	Primary school	60	47,2
	Secondary school	19	15,0
	High school	13	10,2
	Undergraduate / graduate	4	3,1
	Illiterate	31	24,4
Father's educational status	Primary school	37	29,1
	Secondary school	31	24,4
	High school	30	23,6
	Undergraduate / graduate	17	13,4
	Illiterate	12	9,4

The demographic characteristics of the participants studying in the Siirt University Faculty of Education and participating in the research are given in Table 3. Accordingly, 64.7% of the participants are women and 35% are men. 35.3% of them spent most of their lives in villages and towns, 19.5% in districts, 29.3% in cities and 1.9% in metropolitan cities. The monthly expenditure of 39.0% of the participants is 0-500 TL, the monthly expenditure of 42.7% is 500-1000 TL, and the monthly

expenditure of 13.4% is 1000-1500 TL. The mother of 48.8% of the participants graduated from primary and secondary schools, 6.1% from high schools and 6.1% from undergraduate and graduate degrees. The rate of illiterate mothers is 39.0%. The father of 54.9% of the participants graduated from primary and secondary schools, 18% from high schools, and 15.9% from undergraduate and graduate degrees. The rate of illiterate fathers is 11.0%.

Table 3. Demographic characteristics of the participants studying at the Faculty of Education at Siirt University

Demographic characteristics	Parameters	Frequency	Percentage
Gender	Female	53	64,7
	Male	29	35,3
The longest lived place	Village	29	35,3
	District	16	19,5
	City	24	29,3
	Metropolis	13	15,9
Monthly average expenditure	0-500 TL	32	39,0
	500-1000 TL	35	42,7
	1000-1500 TL	1	13,4
	1500 TL and above	4	4,9
Mother's educational status	Primary school	36	43,9
	Secondary school	4	4,9
	High school	5	6,1
	Undergraduate / graduate	5	6,1
	Illiterate	32	39,0
Father's educational status	Primary school	26	31,7
	Secondary school	19	23,2
	High school	15	18,3
	Undergraduate / graduate	13	15,9
	Illiterate	9	11,0

3.2. Question analysis, reliability and normality

Reliability among the five sub-dimensions of the ecological awareness scale and questions were analyzed with Cronbach Alpha values. Cronbach Alpha analysis values are interpreted as in Table 4. In this study, Cronbach

Alpha reliability values of the questions are between 0.79 and 0.90 and it is seen that the consistency is high enough (Table 5).

Table 4. Reliability analysis values [19]

Cronbach Alpha reliability coefficient	Comment
≥ 0.9	Excellent
$0.7 \leq \alpha < 0.9$	Good
$0.6 \leq \alpha < 0.7$	Acceptable
$0.5 \leq \alpha < 0.6$	Weak
$\alpha < 0.5$	Unacceptable

Table 5. Ecological awareness scale α reliability table

Sub dimensions	Number of questions	α
Food	8	.89
Transport and shelter	6	.89
Energy	13	.90
Wastes	8	.90
Water consumption	5	.79
TOTAL	40	.90

Within the scope of normality analyzes, Skewness - kurtosis analysis is based on +1 and -1 as limit values [20]. Skewness - kurtosis values of ecological awareness dimensions are given in Table 6. As can be seen from the

table, the dimensions have a normal distribution. This shows that the analyzes to be performed are suitable for the t test.

Table 6. Ecological awareness dimensions Skewness - kurtosis values

Sub dimensions	Skewness	Kurtosis
Food	-.248	-.240
Transport and shelter	-.313	-.071
Energy	0.979	1.115
Wastes	.550	-.006
Water consumption	.868	.397
TOTAL	.372	.127

3.3. Ecological awareness dimensions descriptive statistics

3.3.1. Descriptive statistics of the Faculty of Agriculture participants

The ranges and averages of the dimensions of the ecological awareness scale calculated for the participants of the Faculty of Agriculture are presented in Table 7.

As seen in Table 7, food average ($X = 19.83$), transportation and shelter average ($X = 12.31$), energy

average ($X = 22.96$), average of wastes ($X = 15.64$) and water consumption ($X = 9.05$). The ecological awareness average of the individuals is ($X = 72.58$). This situation can be explained by the fact that the level of participation of individuals in expressions on the scale has a value between "I am indecisive" and "I agree", but it is relatively closer to "I am indecisive".

Table 7. Descriptive statistics of the ecological awareness dimensions regarding the participants of the Faculty of Agriculture

Sub dimensions	N	Min.	Max.	X	Std. Dev.
Food	127	11,13	27,38	19,8353	3,47479
Transport and shelter	127	5,17	22,83	12,3122	3,51701
Energy	127	12,08	55,23	22,9600	8,40895
Wastes	127	7,13	33,38	15,6417	6,01592
Water consumption	127	4,20	21,00	9,0520	4,06746
TOTAL	127	38,33	122,63	72,5816	16,54884

Whether there is a relationship between gender variable and awareness dimensions was analyzed by t test. According to the results of the analysis, the answers between gender and dimensions have a homogeneous distribution. However, there was no significant relationship between them based on the 95% confidence interval ($p > 0.05$).

The participants were divided into four groups according to where they live most, namely village-town, district, city

and metropolis. Although the groups were homogeneously distributed, no significant relationship was found between the longest lived place and awareness dimensions ($p > 0.05$). In the analysis of all dimensions, post-hoc test (Tukey test) was not performed since the P value was greater than 0.05.

Likewise, the participants were divided into four groups as "0-500 TL, 500-1000 TL, 1000-1500 TL, 1500 TL and

above” according to their average monthly expenditures. The groups were distributed homogeneously, but since the P values obtained as a result of the ANOVA test analysis were greater than 0.05, there was no significant relationship between average monthly expenditure and ecological awareness ($p > 0.05$). This situation is the same in terms of mother education level, father education level

and ecological awareness relation, and no significant relationship was found ($p > 0.05$).

3.3.2. Descriptive statistics of the Faculty of Education participants

The ranges and averages of the dimensions of the ecological awareness scale calculated for the participants of the Faculty of Education are given in Table 8.

Table 8. Ecological awareness dimensions descriptive statistics regarding the Faculty of Education participants

Sub dimensions	N	Min.	Max.	X	Std. Dev.
Food	82	10,13	29,63	20,2088	3,75247
Transport and shelter	82	5,17	25,83	13,0346	3,36281
Energy	82	12,08	47,23	24,9315	8,18786
Wastes	82	7,13	29,63	16,5442	4,96995
Water consumption	82	4,20	20,00	9,3390	3,54160
TOTAL	82	35,33	115,36	76,5869	15,43559

As seen in Table 8, food average ($X = 20.20$), transportation and shelter average ($X = 13.03$), energy average ($X = 24.93$), average of wastes ($X = 16.54$) and water consumption ($X = 9.33$). The ecological awareness average of the individuals is ($X = 76.58$). This situation can be explained by the fact that the level of participation of individuals in expressions on the scale has a value between "I am indecisive" and "I agree", but it is relatively closer to "I am indecisive".

Whether there is a relationship between gender variable and awareness dimensions was analyzed by t test. According to the results of the analysis, the answers between gender and dimensions have a homogeneous distribution. However, there was no significant relationship between them based on the 95% confidence interval ($p > 0.05$).

The participants were divided into four groups according to where they live most, namely village-town, district, city and metropolis. Although the groups were homogeneously distributed, no significant relationship was found between the longest lived place and awareness dimensions ($p > 0.05$). In the analysis of all dimensions, post-hoc test (Tukey test) was not performed since the P value was greater than 0.05.

Likewise, the participants were divided into four groups as “0-500 TL, 500-1000 TL, 1000-1500 TL, 1500 TL and above” according to their average monthly expenditures. The groups were distributed homogeneously, but since the

P values obtained as a result of the ANOVA test analysis were greater than 0.05, there was no significant relationship between average monthly expenditure and ecological awareness ($p > 0.05$). This situation is the same in terms of mother education level, father education level and ecological awareness relation, and no significant relationship was found ($p > 0.05$).

3.4. Comparison of ecological awareness of students studying in Siirt University Faculty of Agriculture and Education

Whether there is a relationship between faculty variable and awareness dimensions in determining the ecological awareness of the two groups was analyzed by t test. According to the results of the analysis, the answers between faculties and awareness dimensions have a homogeneous distribution. However, there was no significant relationship between them based on the 95% confidence interval ($p > 0.05$).

IV. CONCLUSION

As can be seen from the literature reviews, there are many studies conducted on different scales on ecology and ecological awareness issues. However, researches where the subject is used as an educational tool in environmental education are not sufficient. With this study, ecological awareness levels of individuals who have received or are

studying ecology and the integration of ecology issues into their lives were investigated.

According to the results of the research, there was no significant relationship between the students studying in two different faculties. It is very important for individuals to receive ecology education in order to create ecological awareness in their lives, but it is even more important that they incorporate this training into their lives.

Ecological awareness is great importance in the world where nature and natural resources are exhausted, living spaces become more and more restricted over time and life becomes increasingly difficult. In order to leave a livable world and a better living space for future generations, it is necessary to live in a nature-oriented way [21]. This is an inevitable fact of sustainability and living in a sustainable world.

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