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BIOLOGY DEPARTMENT AND SCIENCE EDUCATION STUDENTS' ENVIRONMENTAL SENSITIVITY, ATTITUDE AND BEHAVIOURS

Science and Technology Teacher Yusuf KARADEMİR
Osman Yozgatli Elementary School
Aydin, TURKEY

Prof. Dr. Murat BARLAS
Muğla Sıtkı Koçman University
Mugla, TURKEY

Res. Assist. Çiğdem Aldan KARADEMİR
Adnan Menderes University
Aydın,TURKEY

ABSTRACT

The aim of this study is, to determine the students' environmental sensitivity, attitude and behaviour levels in terms of different variables. The sample included a total of 507 students who studied at Biology department and Science Education undergraduate programme of a state university in Turkey. "Environmental Sensitivity, Attitude and Behaviour Scale" and "Personal Information Form" were used for data collection. Findings show that, there was found a meaningful difference in terms of gender, grade level, choice order, to be a member of civil society organization and reading at least one journal about environment variables. According to their undergraduate programmes and living places there was not found any meaningful difference at all sub-dimensions.

Key Words: Environmental Sensitivity, Environmental Attitude, Environmental Behaviour.

INTRODUCTION

In last three decades, concerns about the environment have increased. Initially, people were interested in discovering the main environmental problems (Fraj & Martinez, 2007). Because at present, one of the greatest problems facing Earth is the impact of humans on environment (Stern, Dietz & Kalof, 1993). Moving towards the goal of sustainability, requires fundamental changes in human attitudes and behaviour. Progress in this direction is thus critically dependent on education and public awareness (UNESCO, 1997). Subsequently, consumers became aware of the need to make more responsible purchases and looked to the institutions to behave in this way too. People are aware that environmental protection is not only the task of firms and institutions, but also their responsibility as consumers (Fraj & Martinez, 2007). So the investigation of students' environmental sensitivity, attitude and behaviours and the discussion of the results have a critical importance. Because Kaiser & Shimoda (1999)'s research results show that, environmental sensitivity is an explanatory variable for environmental behaviours and Kaiser, Wölfing & Fuhrer (1999)'s research results show that, environmental attitudes are an explanatory variable for environmental behaviours. And environmental sensitivity does not effect the environmental behaviour directly but, people who have high environmental attitudes behave environmentalist and they show a tendency to buy ecologic products (Yılmaz, Çelik & Yağızer, 2009). In this framework the aim of this study is to determine the biology department and science education students' environmental sensitivity, attitude and behaviour levels in terms of different variables. Investigation of students' environmental sensitivity, attitude and behaviours in terms of different variables and discussion of the results towards the sub dimensions will contribute to recognize the students at different faculties of a university and to find out that any environmental education programme for students is necessary or not. Also this study will remind the "environmental sensitivity", "environmental attitude" and "environmental

behaviour" concepts to the students again that are very important for environment and human being interaction. For that purpose, the sub-questions of the research are as following:

1. What are the biology department and science education undergraduate programme students' environmental sensitivity, attitude and behaviours?
2. Do the biology department and science education undergraduate programme students' environmental sensitivity, environmental attitude and environmental behaviours differ in terms of the variables such as gender, undergraduate programme, grade level, choice order, living places, to be a member of civil society organization about environment and reading at least one journal about environment variables?

METHOD

Research Model

A general screening model was used in this study.

Participants

The participants of the research includes, randomly chosen through sample method, total of 507 students studying at biology department (n=249) and science education undergraduate programme (n=258) at a state university in Turkey.

Data Collection Tools

Environmental Sensitivity, Attitude and Behaviour Scale: This five point likert scale developed by Yılmaz, Yıldız & Arslan (2011), profitted by researches of Kaiser & Wilson (2000), Fraj & Martinez (2007), Tilikidou & Delistavrou (2008) and Yılmaz, Çelik & Yağızer (2009). It is consisted of 17 items and three factors named as "environmental sensitivity", "environmental attitude" and "environmental behaviour". The coefficiencies of the internal consistency are respectively 0.75, 0.53 and 0.74. Confirmatory Factor Analysis calculated by lisrel 8.74 and the results support that the scale consisted of three subscales (df=291, X^2=487,77, X^2/ df= 1,68, RMSEA=0.047, GFI=0.89, AGFI=0.87, NFI= 0,92, NNFI= 0.97, CFI= 0.97). As a five degree scale was used, the interval coefficients were calculated for four intervals (5-1=4), (4/5=0.80) and the students' means of environmental sensitivity, attitude and behaviours have been interpreted in accordance with the criteria below.

Never = 1.00-1.80 Rarely = 1.81-2.60 Sometimes= 2.61-3.40 Often = 3.40-4.20 Always= 4.21-5.00

The Personal Information Form: In the personal information form prepared by researchers; the questions in relation with the demographical characteristics such as gender, undergraduate programmes, grade level, choice order, living places, to be a member of civil society organization about environment and reading at least one journal about environment have taken part.

Data Analysis

The data collected with the scale was inputted into the computer according the codes that were given the each question on the scale. When inputting the data process was finished, the data was processed and analyzed. In the analysis of the data, arithmetic mean and standard deviation of the students' points were calculated by SPSS 18 package programme. In addition to this, Mann Whitney U and Kruskal Wallis have been used. The significance level was accepted as 0.05.

FINDINGS

In this part findings were given according to the sub-questions as following:

The Findings of the First Sub-question: "What are the biology department and science education undergraduate programme students' environmental sensitivity, environmental attitude and environmental behaviours?" have been given in Table 1.

Table 1: Students' Evironmental Sensitivity, Attitude and Behaviours

Sub-dimensions of the scale	Score Interval	n	Mean	SD	Min	Max	The number of items	Level
Environmental Sensitivity	Totally Disagree Disagree Indecisive Agree Totally Agree	507	4,34	.59	1,17	5	6	TA
Environmental Attitude		507	3,99	.63	1,25	5	4	A
Environmental Behaviour		507	3,30	.64	1,00	5	7	I

Totally Agree: TA Agree: A Indecisive: I Disagree: DA Totally Disagree: TD

As you see in Table 1, students "totally agree" that they are sensitive to environment ($\overline{X}$ = 4,34), "agree" that their attitudes to environment are at high levels ($\overline{X}$ = 3,99), but they are "indecisive" to behave environmentalist ($\overline{X}$ = 3,30).

The Findings of the Second Sub-question: "Do the biology department and science education undergraduate programme students' environmental sensitivity, environmental attitude and environmental behaviours differ in terms of the variables such as gender, grade level, choice order, to be a member of civil society organization about environment, reading at least one journal about environment, undergraduate programme and living places variables?" have been given in Tables.

Table 2: Students' Environmental Sensitivity, Attitude, Behaviours and Gender

Sub-dimensions of the scale	Gender	n	Mean Rank	Sum of Ranks	U	p
Environmental Sensitivity	Girl	331	268,99	89034,50	24167,5	.001*
	Boy	176	225,82	39743,50		
Environmental Attitude	Girl	331	259,49	85892	27310	.243
	Boy	176	243,67	42886		
Environmental Behaviour	Girl	331	265,24	87794	25408	.018*
	Boy	176	232,86	40984		

*Statistically significant differences at p < .05.

As seen in Table 2, there is a meaningful difference (p<0.05) in terms of gender in the sub-dimensions of "Environmental Sensitivity" and "Environmental Behaviour". In other words, the girls' environmental sensitivities and environmental behaviours are higher than that of boys. On the other hand, there is no meaningful difference in terms of gender in the sub-dimension of "Environmental Attitude".

Table 3: Students' Environmental Sensitivity, Attitude, Behaviours and Undergraduate Programme

Sub-dimensions of the scale	Undergraduate Programme	n	Mean Rank	Sum of Ranks	U	p
Environmental Sensitivity	Biology Department	249	262,87	65454	29913	.178
	Science Education	258	245,44	63324		
Environmental Attitude	Biology Department	249	253,79	63193,50	32068,50	.974
	Science Education	258	254,20	65584,50		
Environmental Behaviour	Biology Department	249	243,62	60661	29536	.116
	Science Education	258	264,02	68117		

Table 3 shows that, there is no meaningful difference ($p>0.05$) in terms of undergraduate programmes, in all sub-dimensions that are "Environmental Sensitivity", "Environmental Attitude" and "Environmental Behaviour".

Table 4: Students' Environmental Sensitivity, Attitude, Behaviours and Grade Level

Sub-dimensions of the Scale	Grade level	n	Mean Rank	df	X^2	p
Environmental Sensitivity	1	114	258,15	3	12,864	.005*
	2	137	220,64			
	3	150	258,01			
	4	106	286,98			
Environmental Attitude	1	114	241,17	3	2,194	.533
	2	137	247,47			
	3	150	262,96			
	4	106	263,55			
Environmental Behaviour	1	114	257,67	3	1,958	.581
	2	137	242,43			
	3	150	265,33			
	4	106	248,97			

As seen in Table 4, there is a meaningful difference ($p<0.05$) in terms of grade level only in the sub-dimension of "Environmental Sensitivity". In other words, fourth grade students' environmental sensitivities are higher than that of first, second and third grade students. On the other hand, there is no meaningful difference in terms of grade level in the sub-dimensions of "Environmental Attitude" and "Environmental Behaviour".

Table 5: Students' Environmental Sensitivity, Attitude, Behaviours and Choice Order

Sub-dimensions of the Scale	Choice Order	n	Mean Rank	df	X^2	p
Environmental Sensitivity	First	110	265,58			
	Second-Fifth	160	258,58			
	Sixth- Tenth	89	258,42	3	2,778	.427
	Tenth and above	148	237,78			
Environmental Attitude	First	110	281,49			
	Second-Fifth	160	259,15			
	Sixth- Tenth	89	231,86	3	7,333	.062
	Tenth and above	148	241,32			
	First	110	269,31			
	Second-Fifth	160	268,39			
Environmental Behaviour	Sixth- Tenth	89	214,52	3	9,328	.025*
	Tenth and above	148	250,80			

Table 5 shows that, there is a meaningful difference ($p<0.05$) in terms of choice order only in the sub-dimension of "Environmental Behaviour". In other words, students who choose their undergraduate programmes at their first choice have higher environmental sensitivity than that of students who choose their undergraduate programmes at their second and above choices. On the other hand, there is no meaningful difference in terms of choice order in the sub-dimensions of "Environmental Sensitivity" and "Environmental Attitude".

Table 6: Students' Environmental Sensitivity, Attitude, Behaviours and Living Places

Sub-dimensions of the Scale	Living Places	n	Mean Rank	df	X^2	p
	Metropolis	191	266,15			
	City	122	251,10			
Environmental Sensitivity	District	131	253,98	3	4,275	.233
	Village	63	222,83			
	Metropolis	191	254,16			
Environmental Attitude	City	122	259,73			
	District	131	246,05	3	,655	.884
	Village	63	258,94			
	Metropolis	191	257,87			
Environmental Behaviour	City	122	242,53			
	District	131	257,42	3	,991	.803
	Village	63	257,36			

When Table 6 is examined, there is no meaningful difference ($p>0.05$) in terms of living places, in all sub-dimensions that are "Environmental Sensitivity", "Environmental Attitude" and "Environmental Behaviour".

Table 7: Students' Environmental Sensitivity, Attitude, Behaviours and To be a Member of Civil Society Organization About Environment

Sub-dimensions of the scale	To be a Member of Civil Society Organization About Environment	n	Mean Rank	Sum of Ranks	U	p
Environmental Sensitivity	Member	65	300,84	19554,50	11320,50	.005*
	Not Member	442	247,11	109223,50		
Environmental Attitude	Member	65	294,53	19144,50	11730,50	.016*
	Not Member	442	248,04	109633,50		
Environmental Behaviour	Member	65	301,29	19584,00	11291	.005*
	Not Member	442	247,05	109194		

Table 7 shows that, there is a meaningful difference ($p<0.05$) in terms of to be a member of civil society organization about environment in all sub-dimensions. In other words, students who are a member of civil society organization about environment have higher environmental sensitivity, attitude and behaviours than that of students who are not a member civil society organization about environment.

Table 8: Students' Environmental Sensitivity, Attitude, Behaviours and Reading at Least One Journal About Environment

Sub-dimensions of the scale	Reading at Least One Journal About Environment	n	Mean Rank	Sum of Ranks	U	p
Environmental Sensitivity	Read	61	276,08	16841	12256	.206
	Not Read	446	250,98	111937		
Environmental Attitude	Read	61	278,93	17014,50	12082,50	.153
	Not Read	446	250,59	111763,50		
Environmental Behaviour	Read	61	294,54	17967	11130	.021*
	Not Read	446	248,46	110811		

As seen in Table 8, there is a meaningful difference ($p<0.05$) in terms of reading at least one journal about environment only in the sub-dimension of "Environmental Behaviour". In other words, students who read at least one journal about environment have higher environmental behaviour than that of students who don't read a journal about environment. On the other hand, there is no meaningful difference in terms of this variable in the sub-dimensions of "Environmental Sensitivity" and "Environmental Attitude".

DISCUSSION AND RESULTS

The aim of this study was to determine the environmental sensitivities, attitudes, behaviours of biology department and science education students, in terms of different variables such as gender, undergraduate programme, grade level, choice order, living places, to be a member of civil society organization and reading at least one journal about environment.

As a result of the applied analysis, students' mean points from environmental sensitivity ($\overline{X}$ = 4,34) and environmental attitude ($\overline{X}$ = 3,99) are at high levels. Only from environmental behaviour, students' mean

points are a little low ($\overline{X}$ = 3,30). It shows that, students "totally agree" that they are sensitive to environment, "agree" that their attitudes to environment are at high levels, but beside these, they are "indecisive" to behave environmentalist.

While students' environmental sensitivities and behaviours differ in terms of gender in favor of girls, their environmental attitude doesn't differ. Students' environmental sensitivities (Çabuk & Karacaoğlu, 2003; Çelen, Yıldız, Atak, Tabak & Arısoy, 2002; Yurtseven, Vehid, Köksal & Erdoğan, 2010) and environmental behaviours (Akıllı & Yurtcan, 2009) are high in favor of girls in given studies too. The result of this research about students' environmental attitudes also supports other studies (Kahyaoğlu, Daban & Yangın, 2008). It is expected that, women behave empathic, sensitive, permissive, kindly, thoughtful, tidy and responsible (Kağıtçıbaşı, 1990). These expectations of society make women to use ecologic resources economical and behave them environmentalist. This result can be because of these expectations. According to the undergraduate programme, there was not found any meaningful difference between Biology department and Science Education students. As we investigate the curricula, lessons related to ecology and environmental education take part in biology department and Science Education undergraduate programmes both. And the students, who succeed these undergraduate programmes, come from science-maths department of the high schools.

According to the grade level, while students' environmental attitudes and behaviours don't change, only students' environmental sensitivities differ in favor of fourth grade students. According to the grade level, considering the correlation between environmental sensitivity, attitude and behaviour, only the changing of their environmental sensitivities is a remarkable finding. On the other hand, the difference might be due to the courses related to ecology that students took during their education at university. Engin (2003)'s study results about grade level is parallel with our study results.

In terms of choice order, there was found a meaningful difference only at environmental behaviour in favor of students who choose their undergraduate programme at their first choice. Infact, it is expected that students' environmental sensitivities, attitudes and behaviours must be change correspondingly. As is known, education, is a process to constitute changes through their own experience in the desired direction and deliberately at a person's behaviour (Ertürk, 1987). As the education occurs in the desired direction, students' choice orders are very important to achieve their undergraduate programmes.

Akıllı & Yurtcan (2009)'s research findings show that, there was a meaningful difference in terms of living places in environmental attitudes and behaviours but this research results show that there was not found any meaningful difference ($p>0.05$) in terms of living places, at all sub-dimensions.

According to the analysis, while, only sixty-five students are members of civil society organization about environment, beside this, four hundred forty-two students are not. The number of students who aren't members of civil society organization about environment is great. There was found meaningful difference ($p<0.05$) in terms of to be a member of civil society organization about environment in all sub-dimensions. In other words, students who are a member of civil society organization about environment have higher environmental sensitivity, attitude and behaviours than that of students who are not. In terms of this variable other research results (Sadık & Çakan, 2010; Uzun & Sağlam, 2006) are parallel with this research results.

The last variable was, reading at least one journal about environment. The analysis shows that, number of students who read at least one journal about environment is almost the same with the number of students who are members of civil society organization about environment. Only sixty-one students read at least one journal about environment among five hundred seven students. There was found a meaningful difference ($p<0.05$) in terms of reading at least one journal about environment only in the sub-dimension of "Environmental Behaviour". In other words, students who read at least one journal about environment have higher environmental behaviour than that of students who don't read a journal about environment. On the other hand, there was not found any meaningful difference in terms of this variable in the sub-dimensions of "Environmental Sensitivity" and "Environmental Attitude". Similar to the other results according to grade level,

considering the correlation between environmental sensitivity, attitude and behaviour, only the changing of their environmental behaviours is a remarkable finding.

Because of the term, “environment” is very important for all, so the teachers’ and the parents’ roles must be to educate children as a good environment protectors in the lessons and at their special lives. For this reason, on the other researches with different participants and age groups, environmental sensitivity, attitude and behaviours must be searched out with other variables.

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BIODATA AND CONTACT ADDRESSES OF AUTHORS

Yusuf KARADEMİR is a Science and Technology teacher in Aydin, Turkey. He is also MA student at Mugla Sitki Kocman University, Environmental Science Department. His research areas include environmental education and science education. He attended the congresses about Science and Environmental Education.

Yusuf KARADEMİR
Osman Yozgatli Elementary School
Aydin, TURKEY
E. Mail: ykarademir70@hotmail.com

Murat BARLAS is professor at Mugla Sitki Kocman University, Science Faculty, Biology Department. He worked as a dean and head of Biology Department at this university. Dr. Barlas, give lessons at undergraduate, gradute and doctoral levels. He carried out different projects supported by TUBİTAK and the others. Dr. Barlas guided many thesis at MA and Phd levels. His research interests are aquatic ecosystems, invertebrates and environment. Dr. Barlas, has authored/edited books and authored, co-authored, or presented articles and conference presentations.

Prof. Dr. Murat BARLAS
Mugla Sitki Kocman University
Biology Department
Mugla, TURKEY
E. Mail: **mbarlas@mu.edu.tr**

Cigdem ALDAN KARADEMİR is a research assistant at Adnan Menderes University Science Education Department. She is also PhD student at Curriculum and Instruction Department of Adnan Menderes University. Her research areas include science education and teacher education. She authored, co-authored, or presented articles and conference presentations.

Cigdem ALDAN KARADEMİR
Adnan Menderes University
Science Education Department
Aydin, TURKEY
E. Mail: caldan@adu.edu.tr

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