

PRESERVICE TEACHERS' ANTHROPOCENTRIC, BIOCENTRIC, AND ECOCENTRIC ENVIRONMENTAL ETHICS APPROACHES

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DOI: 10.7813/2075-4124.2013/5-5/B.23

ABSTRACT

Environmental ethics have become more important as environmental problems have become more serious. It is believed that environmental problems can be ameliorated by the application of environmental ethics. With this kind of ethics, individuals obtain some important responsibility such as understanding environmental consequences of their consumption and conserving natural resources and also protecting the world for future generations. There are three basic approaches to environmental ethics: anthropocentrism, ecocentrism, and biocentrism. The purpose of this study is to investigate preservice teachers environmental ethics approaches. A total of 311 preservice teachers from different departments in the Education Faculty of a university participated in the study during the 2012-2013 academic year. An Environmental Ethics Scale developed by the researchers was used to gather the data, which were analysed quantitatively by parametric and non-parametric methods. Results of the study show that the preservice teachers' had strong biocentric and ecocentric approaches, and their approaches did not depend on gender or department in the university.

Key words: Environmental Ethics, Environmental Ethics Approaches, Preservice Teachers

1. INTRODUCTION

Environmental ethics is a branch of bioethics (18) and both are branches of philosophy (16). In the realm of environmental ethics, scholars investigate the relationship between human beings and nature from a moral perspective (2- 7- 10- 14- 16), raising such issues as living in harmony with nature and respect for all life forms. Evoking moral principles and norms such as ecological holism, justice, reasonable consumption, population control, management of resources, and controlled development, environmental ethics helps people to think rationally about developing a sustainable environment (10).

Researchers identify three major approaches to environmental ethics depending on how people think about and interact with their environment: anthropocentrism, biocentrism, and ecocentrism (2- 6). The anthropocentric approach is a combination of egoistic and socialistic values, held by those who emphasize the consequences of environmental deterioration for oneself and for human beings in general (1). It is human-centered, meaning that human beings are the most important life forms (4- 6- 10- 14). People who favor this approach think that nature has instrumental value; they consume natural resources to fulfil their own needs, hoping to develop the environment they most desire (6- 5- 10- 14- 15). Nature is valued for its convenience, and therefore it should be protected for the purpose of maintaining an appropriate quality of life for human beings (4). Needless to say, people who hold such opinions can cause damage to the earth in ways that are hard to heal (10).

According to the biocentric approach, also called life-centred environmental ethics, all forms of life have inherent value and therefore have rights requiring moral consideration. Thus, human beings have the responsibility of protecting the environment (7- 14). Some biocentrists believe organisms have relative importance, that protecting animals is more important than protecting plant species and that protecting mammals is more important than protecting invertebrates. On the other hand, some 'biocentric egalitarians' believe that all living organisms have an equal right to exist (6).

The ecocentric approach is parallel to the biospheric approach (4). Since a whole ecosystem, including inanimate rocks and soil (2), has intrinsic value, it deserves protection (4- 6- 7- 15). Those who favour this approach are the most likely to support the environment through concerned behaviour (27).

Environmental ethics have developed since it was first realized that the earth was losing its balance. Some people understood that human beings were causing the degradation of natural resources, global warming, climatic changes, land destruction, acid rain, and depletion of the ozone layer by our mistreatment nature. Researchers agreed that anthropocentrism lay behind these crises (10). Kassiola (13) argued that environmental problems can be solved if the nature of the problems are fully understood. To understand the issues, education is important, and the necessary education must include not only environmental science but also bioethics and social ethics (Gifford, 2002, cited in 19).

Environmental ethics must be one of the major components if environmental education is to develop positive environmental behaviour (9). Students can learn the importance of responsibility and learn the consequences of

reckless consumption of natural resources. By engaging with environmental ethics individuals can forgo their anthropocentric values. In the process, understanding their own environmental approach is an important step.

In the literature, there have been various studies conducted to determine an individual's approach to environmental ethics (28). Scales, moral dilemmas (20), and interviews have been used for diagnostic purposes (5). Tuna (28) investigated public environmental values in terms of anthropocentric and ecocentric world views by using interviews and close-ended questions. Thompson and Barton (27) investigated the same world views by using a two-dimensional instrument. Some researchers evaluated individuals' environmental ethics considering only two values, either anthropocentric and ecocentric or anthropocentric and non-anthropocentric (3- 12- 27- 28), whereas others considered three or more values, anthropocentric, ecocentric, biocentric, theocentric, individualistic, and/or deep ecological (1, 21). The purpose of this study is to investigate preservice teachers' approaches to environmental ethics, including anthropocentric, biocentric, and ecocentric approaches. Based on this aim, it was decided to address the questions:

- What are the environmental ethics approaches of preservice teachers?
- Is there any difference between males and females in terms of environmental ethics approaches?
- Is there any difference among preservice teachers' environmental ethics approaches in terms of their departments?

2. METHOD AND SAMPLING

In this study, conducted during the 2012-2013 academic year, a survey was used to investigate preservice teachers' approaches to environmental ethics. A total of 311 preservice teachers from various departments participated in the study. Distribution of the sample is shown in the following table:

Table 1. Distribution of the sample

Department	Gender	
	Female	Male
Pre-school education	71	11
Primary school education	81	72
Mathematics education	29	9
Science education	20	18

2.1. Research Instrument

The Environmental Ethics Scale was developed by the researchers (23). It comprises 25 5-point Likert-type items concerning environmental ethics. It has three subdimensions: anthropocentric (8 items), ecocentric (6 items), and biocentric (11 items). The Cronbach alpha reliability values of the scale and subdimensions were found to be .75 for the scale and .78, .85, and .86 for the subdimensions. The highest score the preservice teachers could get in the anthropocentric dimension was 40, 55 in the biocentric dimension, and 30 in the ecocentric dimension.

To obtain demographic data, the preservice teachers' gender and department were also recorded.

2.2. Data Analysis

Quantitative analysis methods with a significance level of $p < .05$ were used to analyse the data. To check the distribution of the sample, the Kolmogorov-Smirnov test was used. The results of this test indicated a deviation from normality ($p < .05$), which means that the distribution is significantly different from a normal distribution (8). Considering this result, non-parametric analysis including a t-Test and ANOVA were selected for data analysis.

3. FINDINGS

Table 2. Results of one-sample K-S test

	General	Anthropocentric	Biocentric	Ecocentric
N	311	311	311	311
Mean	93.099	19.128	48.218	25.752
Std. Deviation	8.756	5.815	5.660	3.484
Z	1.161	1.526	2.074	2.021
P	.13	.01	.00	.00

As can be seen in Table 2, the results of the Kolmogorov-Smirnov test indicated that the scores obtained from the scale showed a normal distribution ($Z: 1.16$; $p > .05$). Subsequently, the results of parametric analysis (t-test) for each dimension of the scale showed a deviation from normality, ($Z_A: 1.52$; $Z_B: 2.07$; $Z_E: 2.02$; $p < .05$), which means that the distribution was significantly different from a normal distribution (Field, 2000, pp. 46-47). Consequently, non-parametric analysis was used for data analysis.

Table 3. Results of ANOVA test

N, \bar{X} , Sd				Results of ANOVA Testing					
Departments	N	\bar{X}	S.D	Source of variance	Sum of squares	Df	Mean square	F	p
Preschool education	82	93.19	9.29	Between groups	388.02	3	129.3		
Primary school education	153	93.69	7.91	Within groups	23381.8	307	76.1		
Mathematics education	38	93.44	8.58	Total	23769.9	310		1.69	.16
Science education	38	90.15	10.57						
Total	311	93.09	8.75						

ANOVA was used to reveal the preservice teachers' environmental approaches according to department in the university. In order to decide which technique should be used, the differences between the groups' homogeneity of the variances was checked by using the Levene test. Since variances were found to be homogeneous (Levene: $p > .05$), the Scheffe test was selected as a comparison test (25). The results revealed that there were no statistically significant differences among departments ($F: 1.69; p > .05$).

Table 4. Results of Scheffe test

Department (I)	Department (J)	(I-J) Mean Difference	Std. Error	p
Preschool education	Primary school education	-.497	1.194	0.98
	Mathematics education	-.252	1.712	0.99
	Science education	3.037	1.712	0.37
Primary school education	Preschool education	.497	1.194	0.98
	Mathematics education	.245	1.581	0.99
	Science education	3.534	1.581	0.17
Mathematics education	Preschool education	.252	1.712	0.99
	Primary school education	-.245	1.581	0.99
	Science education	3.289	2.002	0.44
Science education	Preschool education	-3.037	1.712	0.37
	Primary school education	-3.534	1.581	0.17
	Mathematics education	-3.289	2.002	0.44

Table 4 shows that the Scheffe test revealed no statistically significant differences among preservice teachers in terms of their environmental approaches ($p > .05$).

Table 5. Results of t-test

Gender	N	\bar{X}	S.D	S.E	t	t-test df	p
Female	215	93.26	8.572	0.584	0.512	309	0.60
Male	96	92.71	9.190	0.937			

To consider gender, a t-test was applied to find the differences between males and females in terms of environmental approach. As seen in Table 5, variances were found to be homogeneous ($F: 0.07; p > .05$); no statistically significant differences were found between genders.

Table 6. Results of Kruskal Wallis test

	Department	N	\bar{X}	MR	X^2	df	p
Anthropocentric	Preschool education	82	19.42	161.16			
	Primary school education	153	18.69	147.47	4.414	3	0.22
	Mathematics education	38	20.63	180.18			
	Science education	38	18.73	155.03			
Biocentric	Preschool education	82	48.36	163.76			
	Primary school education	153	48.71	161.04	4.548	3	0.20
	Mathematics education	38	47.42	142.25			
	Science education	38	46.68	132.72			
Ecocentric	Preschool education	82	25.40	151.73			
	Primary school education	153	26.28	165.75	4.521	3	0.21
	Mathematics education	38	25.39	147.07			
	Science education	38	24.73	134.92			

The Kruskal Wallis test was used for detecting differences among preservice teachers' anthropocentric, biocentric, and ecocentric environmental ethics approaches in terms of department in the university. According to the results, as shown in Table 6, no statistically significant differences were found.

Table 7. Results of Mann Whitney U test

	Gender	N	\bar{X}	MR	SR	U	Z	p
Anthropocentric	Female	215	18.91	153.39	32978.5	9758.5	-.768	.44
	Male	96	19.61	161.85	15537.5			
Biocentric	Female	215	48.46	159.52	34296.5	9563.5	-1.03	.30
	Male	96	47.66	148.12	14219.5			
Ecocentric	Female	215	25.89	159.14	34216.0	9644.0	-.931	.35
	Male	96	25.43	148.96	14300.0			

The Mann Whitney U test was used to find any differences between females' and males' anthropocentric, biocentric, and ecocentric environmental ethics approaches. According to these results, as shown in Table 7, no statistically significant differences were found.

4. DISCUSSION AND CONCLUSION

This study describes approaches to environmental ethics taken by preservice teachers. The results show that their approaches do not differ in terms of their departments; in other words, their field of study was not a determining influence on their environmental ethics. In research conducted by Tuna (28) a Turkish population over 18 years of age indicated that independent variables such as gender and education did not affect their environmental world view. On the other hand, highly educated respondents demonstrated more environmental commitment as compared to that of less educated respondents.

The results of this study also show that gender was not a determining influence on preservice teachers' environmental ethics approaches. However, other researchers obtained different results in studies of environmental concern. Some found that males were slightly more likely than females to express their environmental concern and more optimistic about finding solutions for environmental problems (17- 30). On the other hand, the findings of yet another study show that females scored higher than males in terms of ethical and emotional viewpoints about nature (26).

The findings of this study indicated that preservice teachers have strong biocentric and ecocentric environmental ethics approaches and that these values did not differ according to their field of study. Some previous researchers obtained similar results from the ecocentric scale (2- 12). However, it seems that preschool preservice teachers tend to have a more ecocentric viewpoint than other preservice teachers (12).

In this study participants who scored lower in the anthropocentric dimension scored higher in the ecocentric and biocentric dimensions. It can be inferred that participants who have these values most likely engage in ecological behaviours and carry out ecological actions (1). On the other hand, some previous studies suggest that university students with an anthropocentric approach do value living species (5).

Studies in the literature about gender differences regarding the environment (attitude, behaviour, concern, world view) revealed that girls tend to concern environment more than men (11- 12- 16- 31). In this study no differences between females and males were found in terms of their anthropocentric, ecocentric, and biocentric approaches. This result is consistent with results obtained from another study (22). However, females and males were specified their approaches as undecided in their study. Thus it can be inferred that the females and males were not be able to make decisions about items in the anthropocentric dimension. For example, when considering the items 'The best use of coastal sites for leisure activitie', 'The worst consequences of destruction of wilderness areas is that people can't see them in the future', 'The most important reason for lakes and rivers clean is that people can engage in water sports', 'The best use of coastal areas is marinas for harbouring boats', 'Best part of filling the coastal sites for fun activities', 'Worst part of destruction of wilderness areas is that people can not be able to see them', 'The most important purpose of keeping lakes and rivers clean is that people can do water sports' or 'The best part of filling coastal areas is that marina could be done' most of the preservice teachers chose the 'Undecided' response. Perhaps their uncertainty occurs in situations that put human interests into conflict. As claimed by Thompson and Barton (27), anthropocentric individuals value nature for its contribution to the quality of human life. Thus people's interests can have a negative effect on nature. Since most of the preservice teachers were uncertain about the items cited above, it seems that they could not suppress their interests. Notwithstanding, most theoreticians agree that students must abandon their anthropocentric approaches in order to exist in an environmental friendly world (Kato, 1991, cited in 2).

One of the results of this study is that most of the preservice teachers displayed ecocentric and biocentric approaches to environmental ethics, but some of them displayed an anthropocentric tendency. This tendency might have an effect on their future students. Values in relation to nature start at an early age (24), and young children tend to be self-centred. Hence it is important to know the disposition of preservice teachers in regard to the environment. Another result is that gender and field of study does not affect preservice teachers' environmental ethics approaches. It seems that preservice teachers have generally held ideas about nature and what is best for the environment.

In the light of these results and this review of related research, it can be suggested that preservice teachers need to leave their anthropocentric approach to environmental ethics and move to a more biocentric approach, particularly to an ecocentric approach, if they and their students are to understand and participate in solutions to environmental crises.

In future, perhaps primary school teachers' environmental ethics approaches should be determined and compared with preservice teachers' approaches and in addition, environmental ethics courses should be prepared and should be included in teacher training programmes.

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