Investigation of Eight Grade Students' Knowledge Level about Global Environmental Problems

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Abstract

This study aims to identify the knowledge level of eight grade students about global problems like greenhouse effect, the deformation of the ozone layer, acid rains and the destruction of biological diversity to analyze the gender and location factor of the students' knowledge level about global environmental problems. 201 randomly selected eight grade students from central schools of Ankara and Burdur attended to this study. 20 item-scale is used as data collection tool in the research. The percentage and frequency values of the students' answers are analyzed. The sum of points is tested for analyzing the variation of gender and location of education factor of students. The conclusive data obtained from this research points out that students have very low knowledge level about reasons and the negative effects of some global environmental problems. In the conclusion of this research; the total points which students get from the global environmental problems survey noticeably vary by the location where they are educated but not changed by the gender factor.

Key words: Global environmental problems, knowledge level, location, gender, student.

Introduction

Environment can be identified as an external shelf that all the creatures exist (Basal, 2003). Environmental problems are negative effects results) that formed on nature's fundamental elements: air, water and soil which also affect negatively basic activities of all living things (Topbaş et all., 1998). While examining the space photography, the earth isn't only a spherical planet but it covers only size of a water drop in the universe. As quoted famously by an astronaut and replace in environmental literature "if you observe the earth from the space, there are no borders that separate the countries". With this perspective we can understand that environmental problems also have no boundaries and they affect the whole world in the same way. Through this reality, the necessity of more sensible, more conscious and international protection progress against environmental problems become obvious. The environmental problems which affect the whole humanity at same time and at the same level are called "global environmental problems". For reaching permanent solutions to those common problems, the international sensibility should be supported by local commonsense. At this point important global environmental problems can be listed as: the deformation of ozone layer, greenhouse effect, climate change, thread of destruction of biological diversity, erosion, desertification, drought, radioactive-nuclear threads.

The environmental problems like consumption of natural sources, the air and water-pollution, global warming, the deformation of ozone layer, acid rains and radioactive

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pollution are increased due to the technological progression (developments) Because of this people should consider protecting the nature, the environment and ecological balance as the technological progression continues (Darçın et all, 2006). The most important step for creating commonsense for environment is education. The basic aims for the environmental education are supplying correct and coherent information to the individuals and make them comprehend the basic concepts and their own relationship with the ecosystem (Andersson & Wallin, 2000). With the education of environment, it's possible that the individuals may gain effective, cognitive, metacognitive and behavioral positive approach for the environment (Senera, 1998). The students are confused about environmental problems such as global warming, the deformation of ozone layer, acid rains and radioactive pollution (Boyes, Chambers & Stanisstreet, 1995). The reason for this interference is acquiring wrong information from their parents, teachers, friends and the media (Pekel & Özay, 2005). For removing conception errors that belongs to the environmental subjects, more scientific and extended researches for education should be designed. These studies may be useful for the reconstruction of students' knowledge capacity (Cordero, 2001). However, teachers can also supply guidance for improving students' thoughts and potentials (Mahakki, Khalick & Boujade, 2003).

The most important property of today's environmental problems is that they aren't local anymore but global. The problems, which are under consideration, influence everyone equally; there is no race, religion, age, gender, social-cultural level differentiation. Therefore, not only the environmentalists are responsible for environmental protection and not only ecologists are responsible for environmental education; the protection of environment is all of ours duty. In this study it is aimed to determine the knowledge level of eight grade students' about global environmental problems like greenhouse effect, the deformation of ozone layer, acid rains and the destruction of biological diversity.

Materials and Method

In this research statistical scanning modelisation is used for studying eight grade students knowledge level about global environmental problems. The survey is held in 2007-2008 Spring semester of academic years.

Sample

This study is carried out on 201 randomly selected eight grade students from central elementary schools of Ankara and Burdur.

Data Collection Tool

The scale that is formed by 20 items is used as data collection tool. Some of the articles the survey is adopted from identical studies (Boyes & Stranisstreet, 1992) and the rest is produced by the researchers.

The answers that students can choose in the survey are designed as multiple-choice with options goes as "True", "False", "I don't know". The scale is applied to 100 eight-grade students for the pilot study. Expert's views are consulted for the content of the survey.

Analysis of Data

Frequency and percentage values calculated by the students' answers to the survey. Students' knowledge level about the environmental problems is tried to be analyzed by the results. For examining the influence of students' gender and location factor on total points t-test is held on independent groups.

Findings

The results of the survey is presented in two parts as "the distribution of frequency and percentage values of students' answers to the survey" and "the differentiation of students' points by the location and gender factors".

The Distribution Of Frequency and Percentage Values Of Students' Answers To The Survey

The classifications of eight-grade students' answers are presented in Table 1.

Table 1. The Distribution of Frequency and Percentage Values of Students' Answers

Expressions	True		False		I don't know	
	f	**%**	**f**	**%**	**f**	**%**
1. If the biological diversity extends more, the other environmental problems will be less.	65	32.3	57	**28.4**	79	39.3
2. The usage of charcoal as an energy source is a reason for the increase of acid rains.	115	**57.2**	25	12.4	61	30.3
3. Global warming isn't one of the reasons of the biological diversity.	50	24.9	121	**60.2**	30	14,9
4. If the global warming increases, the ozone layer will be more damaged.	150	74.6	23	**11.4**	28	13.9
5. The protection of the species program which is under the threat of extinction will decrease the global warming rate.	46	**22.9**	98	48.8	57	28.4
6. The gasses which are released from factory chimneys and car exhausts will cause acid rains.	142	**70.6**	29	14.4	30	14.9
7. If the pollution in the atmosphere increases the deformation of ozone layer will increase too.	162	**80.6**	13	6,5	26	12.9
8. Radioactive substances are motives for the deformation of ozone layer.	129	64.2	25	**12.4**	47	23.4
9. As the ozonosphere gets more damaged, the global warming will extend.	131	65.2	25	**12.4**	45	22.4
10. Acid rains cause pollution of subterranean waters.	132	**65.7**	22	10.9	47	23.4
11. Acid rains don't cause any damage to the biological diversity.	25	12.4	141	**70.1**	35	17.4
12. Global warming doesn't have negative effects on ecosystem.	32	15.9	116	**57.7**	53	26.4
13. Radioactive substances have a great role in formation of acid rains.	116	57.7	24	**11.9**	60	29.9
14. The deformation of ozone layer affects negatively the terrestrial ecosystem.	113	**56.2**	26	12.9	62	30.8
15. Acid rains don't affect the biological diversity in lakes.	24	11.9	128	**63.7**	49	24.4
16. The increase of acid percentage in the rains will also expand global warming.	101	50.2	31	**15.4**	69	34.3
17. The radioactive pollution caused by nuclear power plants also augments the greenhouse effect rate.	78	38.8	41	**20.4**	82	40.8
18. Radioactive pollution is the cause of destruction of biological diversity.	127	**63.2**	18	9.0	56	27.9
19. The gasses released from deodorants and sprays don't cause any radioactive pollution.	52	**25.9**	114	56.7	35	17.4
20. The protection of biological diversity will reduce the deformation in the ozone layer.	94	46.8	55	**27.4**	52	25.9

As seen in table 1, only 28.4 % of eight grade students are aware of the expansion of biological diversity won't reduce all of the environmental problems. Greater biological diversity is only a factor for reducing the global warming. 57% of the students chosen correct

answer to the question "the usage of charcoal as an energy source is a reason for augmentation of acid rains"

The students aware of that the global warming is one of the reasons for the destruction of biological diversity are 60.2%. 74.6% of the students have the wrong idea that the augmentation of global warming causes the deformation of ozone. "The protection of species that under the threat of extinction will decrease the rate of global warming" question has only 22.9% correct answer.

Great majority of the students like 70.6% know that the factory chimneys and car exhausts cause acid rains. For the question "if the pollution in the atmosphere increases, the deformation of the ozone layer will increase too" 80.6% of the students gave correct answer. "Radioactive substances are motives for the deformation of ozone layer" question is answered incorrect with 64.2 %.65.2% of the students are wrong with answer of "As the ozonosphere gets more damaged, the global warming will extend". 65.7% of the students are aware of the fact that acid rains cause the pollution of subterranean water sources.

It is obvious that 70.1% of the students know that acid rains destroy the biological diversity. "Global warming doesn't have negative effects on ecosystem." question is answered correctly by choosing that it's wrong. 57.7% of the students have the wrong idea that radioactive substances have a great role in formation of acid rains. 56.2% of the students are aware of the fact that the deformation of ozone layer affects negatively the terrestrial ecosystem. 63.7% of the students gave correct answer by not agreeing the expression of "Acid rains don't affect the biological diversity in lakes"

50.2% of the students made an incorrect correlation for the expression the increase of acid percentage in the rains will also expand global warming.

For the question "The radioactive pollution caused by nuclear power plants also augments the greenhouse effect rate" 20.4% of the students refused the answer proofed that they are right. 63.2% of the students are aware of the radioactive pollution is the motive for destruction of biological diversity. 56.7% of the students have the wrong idea for the question the gasses that are released from deodorants and sprays cause radioactive pollution. 46.8% of the students agree the protection of biological diversity will reduce the deformation in the ozone layer and they are wrong about it.

The Differentiation of Students' Points By the Location and Gender Factors

For examining the influence of students' gender and location factors on their total points t-tests are held for independent groups, the results are exposed in Table 2.

Table 2. The Differentiation of Students' Points By the Location and Gender

Gender	N	$\bar{x}$	S	sd	t	p
Girl	97	8.45	2.67	198	0.549	0.584
Boy	104	8.24	2.92			
Location						
Ankara	100	8.89	2.87	199	-2.832	0.005
Burdur	101	7.79	2.60			
Total	201					

As seen in Table 2, it can be understood that students' points aren't statistically difference according to the gender. On the other hand, there is a significant difference ($p<0.05$) between students' points according to the locations in favor of Ankara.

Conclusion and Recommendations

It can be said that eight grade students have low average points (8.35) from the survey about global environmental problems. If the results are analyzed it is obvious that students have inadequate information about environmental subject and concepts. Also, the students are confused about the subjects because they assemble incorrect cause and effect relation between the deformation of ozone layer, global warming, acid rains and radioactive pollution. For instance; the majority of students consider that the deformation of ozone layer is related parallel to the global warming. On the other hand, they are aware of those environmental problems have negative effects on biological diversity. Most of the students assembled correct relationship between acid rains and biological diversity but almost half of them made incorrect correlation between the acid rate of rains and global warming. It is also observed that most of the students are aware of the fact that radioactive pollution would be a reason for the destruction of biological diversity. Nevertheless, almost half of the students have the wrong idea about deodorants and sprays that cause radioactive pollution.

In conclusion of the study, these suggestions below can be made:

- For eliminating students' incorrect point of view about environmental subjects, the environmental subjects, the environmental education should be supplied which is based on scientific understanding and including correct and coherent information.
- The environment is a sensitive subject, which should be analyzed and evaluated carefully with other fields like politics, economy and sociology.
- For environmental education which is very complicated and contains many subjects, not only mental activities but also visual (computers etc.) and experimental materials should be used in necessary cases.
- During the education process, not only the schools but also the parents, social communities and the media should support the students with the same sensivity.
- By using researches, correct education strategies could be planned as the zero point knowledge level of participants is well analyzed.
- Teachers and teacher candidates must have correct and coherent information about environmental problems so that the future generations' ideas will be affected positively.

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