

Knowledge, Attitudes and Behaviours towards the Environmental Issues: Case of Northern Cyprus

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ABSTRACT

The study aims to investigate the knowledge of students as well as the relationship between attitudes and behaviour also based on gender towards the environmental issues. For this purpose, a survey study was conducted using a group of students who are the eighth grade students at a secondary school in the North Cyprus. This study was performed in the second half term in the 2016-2017 academic year. In the study, the research data was gathered with "Environmental Knowledge Test", "Environmental Attitude Scale" and "Environmental Behaviour Scale" developed by Cömert (2011). Furthermore, in the analysis of data, the descriptive statistics, independent t-test and correlation analysis were used. According to the results, the majority of the eighth grade students have misconceptions and a lack of knowledge about the environmental issues. Additionally, we concluded that environmental knowledge, attitudes and behaviours of participants have not a significant difference based on the gender. The results revealed that the environmental knowledge of students and environmental attitudes have a moderately positive relationship.

Keywords: environmental attitudes, environmental behaviours, environmental education, environmental knowledge

INTRODUCTION

Environment is the platform where humans and other living things interactively carry on their all biological, chemical, social, economic and cultural activities (Yıldız et al., 2008). Also, environment is comprised of all of the physical, biological, chemical and social elements that can be directly or indirectly influenced the organisms (Yücel, 1999). Unfortunately, the environment is destroyed in parallel with the rapid development of the industry by consumption of natural resources for raw materials and there is an increase in production waste and unconscious human activities (Seçgin et al., 2010).

With the improvement of living standards, many conditions are changing in our environment because of the substantive development of science and technology. If the environmental problems that arise in this way are not prevented, it will be the end of life on earth (Yılmaz et al., 2002). The most important threat on environment is the environmental problems such as; the decrease in energy resources, agricultural issues, desertification, aridity, reduction of forest areas, disappearance of living species, air pollution, water pollution, land pollution, global warming, greenhouse effect, ozone layer depletion, acid rain, nuclear pollution (Görmez, 2003; Hayta, 2006; Yardımcı & Kılıç, 2010). Both state and individuals have the responsibility in the formation and prevention of environmental problems (Ünal et al., 2001).

The main purpose of environmental education is to raise environmental awareness by increasing environmental conscience and to create pro-environmental behaviour (Başal, 2003; Mangas et al., 1997). It has an important role to educate students consciously and sensitively about the environment to find a permanent solution to the environmental problems (Uzun & Sağlam, 2006). Teachers and students as the basic elements of the education system are needed to be informed for the purpose of the protection of environment with favourable developments

Contribution of this paper to the literature

- The purpose of the present study was to investigate the knowledge of students and the relationship between attitudes and behaviour towards the environmental issues based on the gender for eighth grade students in the North Cyprus.
- In this study, we have shown that the environmental knowledge, attitude and behaviour of eighth grade students in secondary education were not sufficient in the North Cyprus. Environmental knowledge has moderate relation with the environmental attitude.
- The findings reveal that the environmental attitude has moderate relationship with the environmental knowledge and behaviour. Besides of this, it's found that gender neither effective variable on the environmental knowledge attitude nor behaviour.

in the attitudes and the behaviours of individuals towards to the environment (Ünal et al., 2001). Awareness about their responsibilities of individuals are particularly important because individuals have influential to the emergence of environmental problems. The level of education which most efficiently for individuals belong the environmental education is the secondary education (Sama, 2003). So the purpose of the present study was to investigate the knowledge of students and the relationship between attitudes and behaviour towards the environmental issues based on the gender for eighth grade students in the North Cyprus.

Researchers show that students have conceptual misconceptions about important environmental issues such as global warming, ozone depletion and acid rain. For instance, Boyes et al. (1993) had found that from fifth grade to tenth grade, students had misconceptions about the greenhouse effect, ozone depletion, reduction of biological diversity, air and water pollution, nuclear power. It was also stated by Boyes and colleagues that students also had difficulty in establishing relationships between these environmental issues. In another study conducted by Groves and Pugh (1999) extended the study of Boyes et al. and worked with students from different departments such as education, pharmacy, science and fine arts. It has been reported that the results support the work of Boyes et al. and also found that the primary education is the effective factor on the misconceptions through the environmental issues. In a research conducted by Andersson and Wallin (2000) which is about to determinate the knowledge and the conceptual misconceptions of grade ninth and twelfth students regarding environmental and natural resources performed with open-ended questions. According to the results despite students could not completely explain the greenhouse effect and related concepts; they were aware of the ozon layer depletion was a result of human activities. In order to determine the conceptual misconceptions about global warming and climate change issues Shepardson and his colleagues (2009), performed open-ended questions, drawings and assessment tools for seventh grade students. Similar to previous studies, it has been determined that students have conceptual misconceptions about global warming, climate change, especially greenhouse effect and it's relationship with global warming. Boyes and Stanisstreet (1997) reported that the most of the 13 and 14 years old students think that holes in the ozone layer cause the greenhouse effect rather than thinking that the greenhouse effect causes ozone layer damage. Similarly, pursuant to the literature review, students believe that the ozone layer depletion was the main cause of global warming (Meadows & Wiesenmayer, 1999; Rye et al., 1997). According to the study results of Çelikler and Aksans (2014) which aimed to analyse pre-service science teachers' knowledge and misconceptions about greenhouse effect by using drawing and writing; they reported that pre-service teachers had inadequate knowledge and misconceptions about the greenhouse effect. However, Cömert (2011) reported that some of the students from seventh grade had misconceptions about acid rains, ozone layer and greenhouse effect at low levels. Jeffreis et al. (2001) investigated consequences, causes and cures of the greenhouse effect with biology students and compare the results with their studies from 10 years ago. They found that many of students were unaware of the potential effect of global warming on the distribution of crop pests, or that ground level ozone acts as a greenhouse gas. Also, results reveal that students had misconceptions such as global warming was caused because of the increased penetration of solar radiation which was connected with holes in the ozone layer; as a result of this the risk of skin cancer increased and can be reduced by using unleaded petrol. They stated that despite of media publicity and inclusion of the issue of global warming in the formal curriculum, the results were not better than the study which had done before. Sargın et al. (2016), reveals that participants could answer the questions about the environment which were general and not detailed correctly but at exhaustive questions could not.

Most educational interventions depend on the knowledge transfer because knowledge has an essential effect on the behaviour of persons (Frick et al., 2004). Improving of environmental knowledge which is necessary as a requirement to ecological behaviour, viewed as basic component of the environmental education (Otto & Pensini, 2017). Bradley et al. (1999), found significant correlation between the environmental knowledge and attitudes of high school students.

Vicente-Molina et al. (2013) reported that while knowledge influences pro-environmental behaviour, attitude and informal education were not relevant variables among the university students from countries with different

levels of economic development such as; USA, Spain, Mexico and Brazil. Kose (2010), concluded that in contrast with the attitudes of secondary school students, the knowledge, environmental protection behaviour of their family, settlement area where they lived for the longest time; gender and level of education of their family was not influential. Akış (2011), reported a survey model study about environmental knowledge in the North Cyprus. According to the results, there were no statistically significant relationship between environmental knowledge and the variables such as age, level of education, area of residency, nationality and gender. However, Şafaklı (2012) studied about environmental attitudes in the North Cyprus and results reveal that respondents had pro-environmental attitude although environmental education and the participation in environmental groups are not efficient. Gunduz et al. (2017), performed a study to determinate the level of environmental citizenship of primary school students in the North Cyprus. Besides of these studies, there is not any study about environmental knowledge, attitudes and behaviours for the primary, secondary school or university students in North Cyprus.

Taking all these into consideration, almost no studies are analysing the environmental knowledge, behaviours or attitudes of students in the North Cyprus. Moreover, the determination of the knowledge of students and the relationship between attitudes and behaviour towards the environmental issues makes significant contributions to the literature in relation with the environmental education.

Purpose

The research aims to investigate the knowledge of students, the relationship between attitudes and behaviour based on gender towards the environmental issues. We focused on the research questions as follows:

- What is the level of knowledge about the environmental issues for eighth grade students who were educated in the North Cyprus?
- Is there any significant difference between attitudes, behaviour and knowledge about environmental issues for eighth grade students?
- Is there any significant difference between the environmental knowledge, attitude and behaviour of eighth grade students based on gender?

METHOD

The correlational survey method was used in this research. The sample of the study consisted of 145 eighth grade students from a public school in the North Cyprus during the second half term of 2016-2017 semester. In the present study, the school was selected conveniently. All students have nearly same curricula and have taken the Science and Technology courses.

In North Cyprus, environmental education has started with fourth grade students at primary education level. The Science and Technology curriculum aims to develop students with prerequisite skills for their future learning (MEB, 2016). At secondary education; sixth, seventh and eighth grades students have Science and Technology Course which include several topics about the environmental issues. For the Science and Technology Course for the eighth grade students, the education manual has been written by Ünver (2014) and contain topics which through the environmental issues, such as renewable and unrenovable energy resources, acid rains, the chemicals which contaminating the land, water and air, water pollution, air pollution and land pollution.

Instruments

Environmental knowledge test

The knowledge test developed by Cömert (2011), was used to determinate the level of knowledge about environmental problems and their effects on students. The knowledge test consisted 23 multiple choice questions and reliability coefficient was found as 0.75. Distribution of the questions based on the environmental topics shows that a question for each was about air pollution and nuclear contamination, eight questions about the global warming and greenhouse effect, three each question about the acid rain, ozone layer and water pollution and four questions about land pollution.

The environmental test questions aim to determinate the knowledge level students under their Science and Technology curriculum. Two example of the questions have shown below:

- 1) Which of the following gases given below effects global warming more?
 - a) The gases emitted from garbage heaps to the atmosphere
 - b) The gases formed by burning of fossil fuels such as coal and petroleum *
 - c) The gases which released during the respiration of living things

Table 1. Descriptive statistics for environmental knowledge of eighth grade students

Environmental knowledge range of scores	Number of students	Percentage of students
0-7	66	45.5
8-15	71	49.0
16-23	8	5.5

Table 2. Correlation analysis results related to the relationship between environmental knowledge, environmental attitude and environmental behavior scores

		Correlation Coefficient		
		Environmental knowledge	Environmental attitude	Environmental behaviour
Environmental knowledge	Pearson Correlation Sig. (2-tailed)	1.00	0.46*	0.21**
Environmental attitude	Pearson Correlation Sig. (2-tailed)	0.46	1.00	0.40
Environmental behaviour	Pearson Correlation Sig. (2-tailed)	0.21	0.40	1.00

*Correlation is significant between knowledge and attitude at the 0.01 level (2-tailed).

** Correlation is significant between knowledge and behaviour at the 0.05 level (2-tailed).

- d) The gases which used as a cooler in refrigerators and air conditions
- 2) “Did you know that it must take millions of years for a certain amount of soil to form in our school garden?”
Which of the following below is not one of the precaution to reduce soil pollution?
- Popularize the organic agriculture
 - Be conscious in fertiliser use
 - Prevention irrigation without treatment of waste water
 - Dissemination of agricultural pesticides *
- The correct answers stated with *

Environmental attitude scale

The environmental attitudes measured through the questionnaire which was prepared by Cömert (2011), consisted of four-point Likert type 32 items. 18 items were in positive and 14 items were in negative meaning. Negatively worded items were scored in the reverse order. The reliability of the scale was high and Cronbach alpha coefficients calculated as a 0.85. The scale contains 3 sub-factors. First sub-factor consist of 9 items which explain the requests of students to be informed about the environment; second sub-factor consist of 16 items which explain the environmental awareness; and third one consist of 7 items which declaratory the desire to participate in environmental activities.

Environmental behavior scale

The Environmental Behavior Scale which prepared by Cömert (2011), used for data collection. The Environmental Behaviour Scale represents a popular format for a four-point Likert-type scale that consists in respondents can be asked to write down X in one the box between four possible responses: Strongly agree, Agree, Disagree, and Strongly disagree. The scale consisted of 22 items were in positive and 3 items were in negative meaning. Totaly there were 25 items and 3 sub-factors covering the Environmental Behaviour Scale: 10 items (1, 5, 6, 9, 12, 13, 14, 16, 18, 19, 22) to determinate the knowledge of students in explaining the level of behaviours; 9 items (2, 3, 4, 7, 8, 20, 21, 24, 25) to describe the level of informing of entourage; 6 items (10, 11, 15, 16, 17, 23) to explain their support to recycling.

Findings

Descriptive statistics related to the first research question of the study have shown in **Table 1**.

We classified the students in three groups belong the possible range scores for the environmental knowledge test. Distribution of scores for the Environmental Knowledge Test (**Table 1**) shown that only 5% of students get high score from the environmental knowledge test. Almost half of the students, approximately 49%, had an average score from the test.

In terms of the second research question, the correlation analysis was used to determinate the relationships between environmental knowledge, attitude and behaviour (**Table 2**).

Table 3. Classification of students based on gender

Gender	Frequency	Percent
Female	66	45.5
Male	79	54.5

Table 4. Independent t-test results related to comparison of the scores based on gender

Environmental Knowledge						
Gender	N	Mean	S	Sd	T	P
Female	66	8.80	3.72	143	0.39	0.69
Male	79	8.56	3.75			
Environmental attitude						
Female	66	94.89	14.51	143	1.53	0.13
Male	79	91.47	12.29			
Environmental behavior						
Female	66	63.65	10.57	143	0.34	0.74
Male	79	63.03	11.69			

We found statistically positive correlations between the environmental knowledge, attitude and behaviour of students. If the correlation coefficient is 1, the relationship between that variables is perfect; if the correlation coefficient is 0; there is no relationship. Explication of the correlation coefficient depends on its magnitude; if the absolute value of the correlation coefficient is between 0.70-1.00, the relationship is high; 0.70-0.30 is moderate; 0.30-0.00 is weak (Büyüköztürk, 2017). The environmental knowledge did not have a higher correlation with environmental behaviour ($r=0.21$) than with environmental attitudes ($r=0.46$). However, environmental behaviour which responsible with the environmental behaviour, had a significantly stronger correlation with environmental attitude ($r=0.46$) than environmental knowledge ($r=0.21$). Therefore, the environmental attitude has a moderate relationship with the environmental knowledge and behaviour. However, the relation between the environmental knowledge and behaviour is weak.

According to the third research question, we firstly classified students based on gender (Table 3).

According to Table 3, total of 145 students; 45.5 % were females and 54.5% were males, completed the data collection tools. Independent t-test results related to comparison of the knowledge test, attitude scale and behaviour scale scores based on gender has shown in Table 4.

Comparison of the scores on the knowledge test, attitude scale and behaviour scale with gender showed that there was no significant difference ($p>0.05$).

CONCLUSION AND DISCUSSION

In this study, we have shown that the environmental knowledge, attitude and behaviour of eighth grade students in secondary education were not sufficient in the North Cyprus. Environmental knowledge has moderate relation with the environmental attitude. Thus improving of curriculum at secondary education in countenance to environment will enhance enviromentally attitudes and also behaviours.

There are several studies about the influence of gender on the environmental knowledge, attitude and behavior. Similar with our result, gender neither effective variable on the environmental knowledge, attitude nor behaviour, Kose (2010), reported that gender do not influence the environmental attitudes. In contrast of us, Uzun (2007) relieved that the environmental behaviour and knowledge of students were not found be statistically significant and also depends on the gender environmental behaviour and knowledge of female students were found to be higher than male students. Asunta (2004) reported that media and science teachers were the most important environmental sources and besides that the environmental behaviour and knowledge of girls were more positive than the boys. Besides of this, Akçay and Pekel (2017) had research with prospective teachers who were from different branches such as; biology, chemistry, physics, sociology, geography, history and primary science and established that gender in the branches and genders was not efficient factor through the environmental awareness and the environmental sensitivities.

Similar with our study, Kuhlemeier et al. (1999), reported that all relations between environmental behaviour, attitude and knowledge were substantial. Although the relations between environmental attitude and knowledge found were quite higher than other studies (Hines, 1987). According to the results of the study which performed by Sönmez and Yerlikaya (2017), there was a relation between the environmental behaviour and knowledge of eighth grade students, In contrast with us, they reported that female students had better knowledge through the environmental issues than males. On the other hand, Evans et al. (2007) proved no correlation between environmental attitudes and behaviours.

The knowledge, awareness and attitudes of the students towards the environment can be determined and improved to educate environmentally sensitive individuals at the level of secondary education (Uğulu & Erkol, 2013) since the level of education is one of the most important factor influencing environmental awareness and environmental behavior (Wright, 2007; Zilahy & Huisinigh, 2009; Zsoka et al., 2013). Michalos et al. (2009), reported that students and adults had attitudes favourable to sustainable development was relatively more effective than age, levels of education and knowledge. At the same study, Michalos et al. determined gender was most influential factor through the environmental behaviour while the attitudes were for adults. Atasoy and Ertürk (2008) studied sixth, seventh and eighth grade of students to detect knowledge and attitudes about environment and found that students environmental knowledge and attitudes were not adequate level. Review of literature demonstrates that education creates a positive impression on the environmental behaviours (Blomquist & Whitehead, 1998; BreCARD et al., 2009; de Silva & Pownall, 2014; Meyer, 2015).

Our finding suggests that environmental knowledge has relation with environmental attitude and behaviour. Even so, the environmental problems keep increasing from day to day, that makes important to in relation with more environmental issues to curriculums. Future research is needed to investigate teaching approaches and help to improve curricula on environmental issues.

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