



GEOGRAPHICAL REGIONS AS A SILENT PREDICTOR OF RESPONSIBLE ENVIRONMENTAL BEHAVIOUR

ÇEVREYE SORUMLU DAVRANIŞ BELİRTECİ OLARAK COĞRAFI BÖLGELER

Gaye TEKSÖZ*, Ceren TEKKAYA**, Ayhan Kürşat ERBAŞ***

ABSTRACT: The purpose of this study was to investigate the regional differences in students' awareness, perception, optimism and responsibility development toward environment. The data used for the study was obtained from the one produced by the Programme for International Student Assessment (PISA) 2006 and comprised of the Turkish sample of 4942 fifteen year-old-students (2290 girls and 2652 boys) attending 160 schools across 78 provinces and 7 geographical regions. The data were statistically analyzed by using frequency distributions and multivariate analysis of variance (MANOVA). Results indicated that there is a significant effect of geographical regional differences, although small in magnitude, on students' responsibility towards natural resources and environment.

Key words: environmental education, environmental concern, environmental optimism, environmental sustainability, geographical region.

ÖZET: Bu çalışmanın amacı, Türkiye'nin farklı coğrafi bölgelerinde yaşayan 15 yaş grubu öğrencilerin doğal kaynaklar ve çevre ile ilgili sorunlara yönelik farkındalık, kaygı, iyimserlik ve sorumluluk gelişimlerinin bölgelere göre değişimini araştırmaktır. Araştırmanın veri kaynağını ve örneklemini 2006 Uluslararası Öğrenci Değerlendirme Programı (PISA) kapsamında Türkiye'nin 7 coğrafi bölgesinde, 78 ildeki 160 devlet ve özel okula okuluna devam etmekte olan 15 yaşındaki toplam 4942 öğrenciden (2290 kız, 2652 erkek) elde edilen veriler oluşturmaktadır. Veriler, frekans dağılımları ve çoklu varyans analizi (MANOVA) kullanılarak analiz edilmiştir. MANOVA sonucunda elde edilen sonuçlar, coğrafi bölge farklılıklarının öğrencilerinin doğal kaynak ve çevre ile ilgili sorumluluk anlayışlarında etkili olduğunu göstermiştir.

Anahtar sözcükler: çevre eğitimi, çevre sorunlarına ilgi, çevre sorunları ile ilgili pozitif düşünce, çevresel sürdürülebilirlik, coğrafi bölge.

1. INTRODUCTION

A considerable body of literature, across a number of countries, has addressed students' views about environmental issues. Studies, generally, tended to explore the relationships between knowledge, attitudes and behavior toward the environment (e.g., Bradley, Waliczek, & Zajicek, 1999; DeChano, 2006; Kuhlemeier, Bergh, & Huub Van Den Lagerweiji, 1999; Negev, Sagy, Garb, Salzberg, & Tal, 2008; Said, Yahaya & Ahmadun, 2007). These studies, however, provided wide-ranging results concerning relationships among those variables. For example, studying with more than 9,000 Dutch ninth-grade students, Kuhlemeier, Bergh, and Huub Van Den Lagerweij (1999) explored the link between environmental knowledge, attitudes, and behavior. Authors reported that more than half of the responded had a favorable attitude toward the environment. The students' knowledge about environmental problems, and their environmentally responsible behavior, however, was found to be inadequate. It was mentioned that majority of students lacked knowledge concerning: energy usage; soil, air, and water pollution; recycling; agricultural activities; tourism; transportation; and recreation. In her article, DeChano (2006) examined the relationship environmental knowledge and attitude by using high school students in Chile, England, Switzerland and United States. Results revealed that although participants have a favorable attitude toward environment, they exhibited low level of environmental knowledge. In addition, no significant association between environmental attitude and environmental knowledge was demonstrated.

In one of the studies, Gambro and Switzky (1992) examined the variables associated with knowledge about environmental issues regarding energy and pollution. Students' knowledge about

* Dr. Orta Doğu Teknik Üniversitesi, İlköğretim Bölümü, gtuncer@metu.edu.tr

** Doç. Dr. Orta Doğu Teknik Üniversitesi, İlköğretim Bölümü, ceren@metu.edu.tr

*** Y. Doç. Dr. Orta Doğu Teknik Üniversitesi, Ortaöğretim Fen ve Matematik Alanlar Eğitimi Bölümü, erbas@metu.edu.tr

energy and pollution were found to be related to the gender, in favor of boys. Compared with male students, female students were less likely to hold higher environmental knowledge. In another study, Worsley and Skrzypiec (1998) investigated Australian high school students' attitudes toward environment with respect to students' regions, gender and socioeconomic status. The students living both in rural and urban regions were found to be concerned, but pessimistic, about environmental issues. Male students were reported to be more optimistic and more supportive of science solutions for environmental problems compared to female students. Recently, Chu et al., (2007) explored Korean children's (Year 3) environmental literacy levels. Students were chosen from large cities, medium-sized cities, and rural areas. Children reported to be lack knowledge related to the interrelationship among creatures and between plants and animals, food chains, energy sources of plants and humans or animals, and the roles of unattractive animals. It was also mentioned that children are not very well enlightened about endangered animals, wild animals, and other topical environmental issues. They, on the other hand, were found to be familiar with air pollution and water pollution. The environmental attitude and behavior dimensions, however, demonstrated that children were not responsive to environmental issues. Analyses suggested that while the correlation between attitude and behavior is the strongest, it is weakest between knowledge and behavior. Moreover, students' gender, the source from where they obtain environmental information and school background of parents were found to be affecting all dimension of environmental literacy, namely, knowledge, attitude, behavior, and skills. For example, compared to boys, girls exhibited better environmental literacy. In attitude scale, while boys gained the lowest mean score, girls earned the highest score. Authors concluded that girls have more responsible behavior towards the environment. Educational background of father found to be greatly influential on students' attitude and knowledge compared to skill and behavior. Educational background of mothers, however, found to be highly influential on students' knowledge compared to attitude, skill, and behavior.

Studies investigating the area of residence on environmental concern reported that students attending to rural schools as being highly concerned and optimistic about environmental issues than students from urban schools (e.g., Grodzinska-Jurczak, Stepska, Nieszporek & Bryda, 2006; Worsley & Skrzypiec, 1998). They claimed that students living in the urban area had less opportunity to care directly for the environment. For example, Grodzinska-Jurczak, et al. (2006) investigated pre-school children's and their parents' environmental attitude and the environmental knowledge level. They found that 6 years old children generally have a "strong environmental stance" and environmentally friendly attitudes. It was also reported that pre-school children's environmental attitude depend on place of their residence. Tikka, Kuitunen, and Tynys (2000) claimed that environmental attitude can be shaped by the location and size of students' hometown. Students living in the densely inhabited area found to develop more favorable attitudes compared to those living in the central part. In a recent study, Özden (2008) found that while Turkish student teachers living in Marmara Region had more favorable attitudes towards environmental problems than all the other six regions, student teachers living in South-eastern Anatolia region have the least environmental attitudes. He claimed that this finding may arise from the rural structure of the region and the low intensity of environmental problems compared to Marmara or other regions. Marmara region, however, is the most industrialized region of the Turkey where faced with many environmental problems, such as air and water pollution, and industrial wastes. Tikka et al, (2000) stated that "as a rule, people coming from the most densely crowded regions seem to be the most worried about the state of environment." They claimed that environmental attitude can be shaped by the location and size of students' hometown. Students living in the densely inhabited area found to develop more favorable attitudes compared to those living in the central part of Finland. Authors argued that students' coming from the crowded, urbanized environment tended to become aware of existing problems and hence adopted sympathetic attitudes toward nature and protection of the environment. Worsley and Skrzypiec (1998) also reported that students living both in rural and urban regions were concerned, but pessimistic, about environmental issues. In particular, students from rural schools were found to be more concerned and expressed more optimism about environmental issues than students from urban schools. They claimed that students living in the urban area had less opportunity to care directly for the environment. However, no significant differences were demonstrated between rural and urban students with respect to their

attitudes towards environment. Hsu and Roth's (1998) study also demonstrated rural-urban differences in environmental action. They reported that area of residence served as a silent predictor of responsible environmental behavior. In their study, Taiwanese teachers who lived and taught in area where they grow up and that teachers living in urban areas found to take more environmental action compared to those living in rural areas. They suggested that people living in urban area were more concerned about the environment since those people are more often exposed to environmental degradation compared to those living in rural areas. Hsu and Roth also claimed that urban residents tended to see human efforts as a suitable solution to environmental problems than those socialize in rural areas. They suggested that while developing and implementing environmental education, rural-urban differences should be taken into consideration. Bogner and Wiseman's (1997) study indicated that there were no differences between rural and urban students regarding their environmental attitudes and behaviors. Recently, Alp, Ertepinar, Tekkaya, and Yılmaz (2007) determined 6th, 8th and 10th grade students' environmental knowledge and attitudes. A statistically significant effect of grade level was found on environmental knowledge and attitudes. While the gender difference on environmental knowledge was not statistically significant, the effect of gender on attitudes toward the environment was statistically significant in favor of girls. Environmental knowledge found to be influential on behaviors not directly, but mediated by behavioral intentions and environmental affects. In a separate study, Alp, Ertepinar, Tekkaya, and Yılmaz (2008) explored elementary school students' environmental knowledge and attitudes, the effects of socio-demographic variables on environmental knowledge and attitudes, and how self-reported environmentally friendly behaviour is related to environmental knowledge, behavioural intentions, environmental affects, and locus of control by using Children's Environmental Attitudes and Knowledge Scale and Locus of Control Scale. Findings showed students had low levels of knowledge, but favourable attitudes toward the environment. Results also revealed significant main effect of father's education level on students' environmental knowledge. The gender difference on students' attitudes toward the environment was found to be significant in favours of girls

In line with these ideas, this study contributes to current understanding of students' knowledge of environmental issues and their attitudes towards the environment by using data set obtained by OECD-PISA 2006, which includes awareness, concern, optimism and responsibility for environmental issues of the students' across different regions of Turkey. The data obtained by PISA was the very valuable one for us, since the environmental education research in Turkey has not yet been accomplished with such data. Thus, the current study is designed to set up an overall picture of the state of environmental understanding of 15 years old Turkish students throughout the country and to detect the factors affecting the changes within the geographical provinces. The questions investigated by the study were:

- a) What are 15-year-old Turkish students' responsibility towards natural resources and the environment (i.e., awareness, concern, optimism and responsibility for environmental issues)?
- b) Is there a significant difference in students' responsibility towards natural resources and environment with respect to geographical region?

2. METHOD

2.1. Sample

The PISA 2006 Turkish data were gathered from 4942 fifteen-year-old students (2290 girls and 2652 boys) in 160 schools attending to Grade 7th (n = 23), 8th (n = 93), 9th (n = 2007), 10th (n = 2671) and 11th (n = 148) across 78 provinces and 7 geographical provinces.

2.2. Measures and Variables

The outcomes measure investigated in this research is students' responsibility towards resources and environment that were measured by four indices in PISA 2006: The *index of students awareness of environmental issues* (ENVAWARE), the *index of students' level of concern for environmental issues* (ENVPERC), the *index of students' optimism regarding environmental issues* (ENVOPT), and

the *index of students' responsibility for sustainable development* (RESPDEV). The details of these indices are provided in OECD (2007, pp.340-341). The Cronbach's Alpha reliability indexes for ENVAWARE, ENVPERC, ENVOPT, and RESPDEV were 0.71, 0.83, 0.87 and 0.81 respectively for Turkish data.

2.3. Data Analysis

The survey data were statistically analyzed using frequency distributions and one-way multivariate analysis of variance (MANOVA). The dependent variables were the ENVAWARE, ENVPERC, ENVOPT, and RESPDEV. The independent variable was region. All inferential analyses are conducted by weighing the data using PISA 2006 final student weight (W_FSTUWT).

3. RESULTS

3.1. Descriptive Statistics

Fifteen years old Turkish students' responsibility towards resources and environment can be described as follows by means of the four components as measured in PISA 2006.

3.1.1. Awareness on environmental issues (ENVAWARE)

Students' awareness on 5 environmental issues (increase of greenhouse gases in the atmosphere, the use of genetically modified organisms, acid rain, nuclear waste, and consequences of clearing forests for other land use) has been tested by means of asking their beliefs about their own level of information related to those issues. The issues and students' responses were presented in Figure 1 with average frequencies. A minority of students, across seven regions reported being aware of the increase of greenhouse gases in the atmosphere (9.7%) and use of genetically modified organisms (9.8%). The percent of students who stated that they never heard about these issues were 26.5% and 22.1% in average, respectively. As far as the frequencies of the acid rain item have been considered, 18.2% stated that they were familiar and 9.2% stated that they never heard about the acid rain issue. Unlike other issues, an average of 30% of students reported being aware of nuclear waste issue. About 3% declared that they never heard about the nuclear waste. Furthermore, while 63.7% of the participants believed that they were familiar with the consequences of clearing forests for other land use, 3.9% declared that they never heard about the issue.

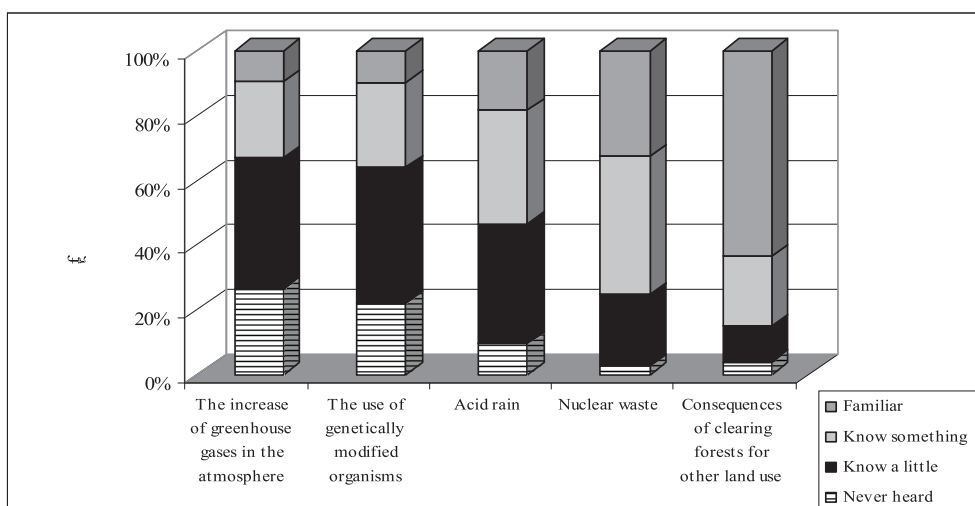


Figure 1: Students' beliefs regarding their own level of information on environmental issues.

As a result, students' beliefs regarding their own level of information on 5 environmental issues can be summarized as that, the issue they are most "familiar" is the consequences of clearing forests for other land use, the one that got the highest "know something" answer was nuclear waste, and the

issue that was answered as “never heard” by most of them is the increase of greenhouse gases in the atmosphere.

3.1.2. Level of concern for environmental issues (ENVPERC)

Turkish students’ levels of concern for environmental issues has been tested for 6 issues (air pollution, energy shortages, extinction of plants and animals, clearing forests by other land use, water shortages, nuclear waste) and the results are presented in Figure 2. As the figure displays, none of the issues were found as “not a concern at all” for Turkish students and more than 85% of the students declared all 6 issues as concern for not only themselves but also others. Only about 10% of the students reported that nuclear waste, energy shortage, clearing of forests for other land use, and extinction of plants and animals were serious environmental concern for other people in Turkey but not for them personally. This finding implies that majority of 15 years old students hold altruistic environmental concern, meaning that they had stronger belief about consequences of environmental damage for others.

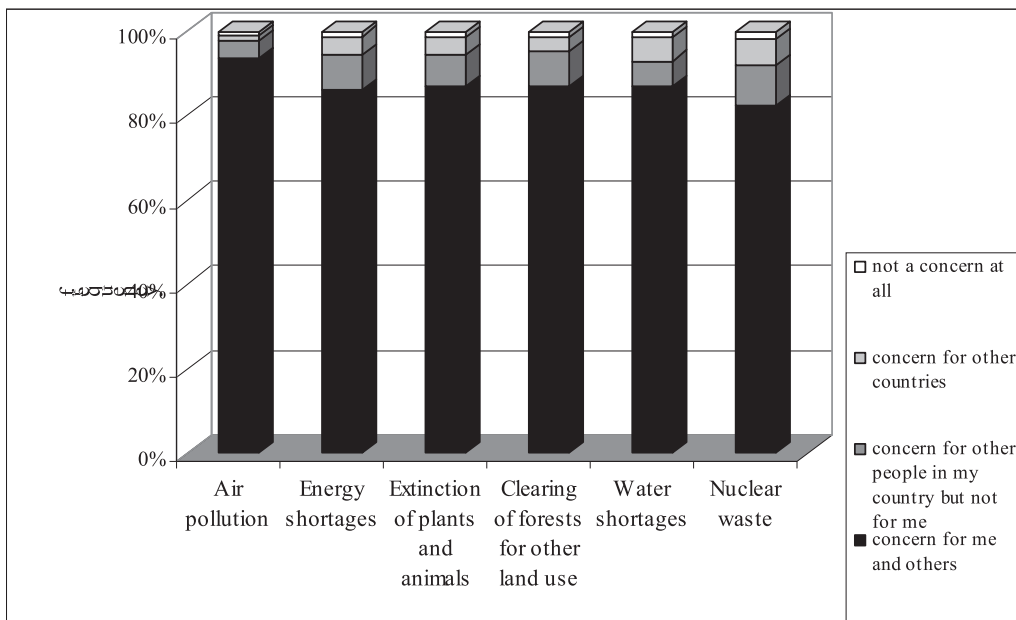


Figure 2: Students’ level of concern for environmental issues

3.1.3. Optimism regarding environmental issues (ENVOPT)

Students’ optimism regarding environmental issues was tested by means of asking the future trends of the problems. As the figure 3 displays, students of this study are far from being optimistic for the future trends of 6 environmental issues. More than 50% of the students stated for all the issues, except energy shortage, that the problem will get worse over the next 20 years.

For the energy shortage problem, on the other hand, almost 30% of the students stated that the problem will be about the same in 20 years and another 23% stated that the problem will be overcome in the next 20 years. The most probable explanation for such a result is that, since renewable energy sources are being declared as complementary for the non-renewable ones, students would think that the new energy sources will replace with the old ones and the problem will be solved.

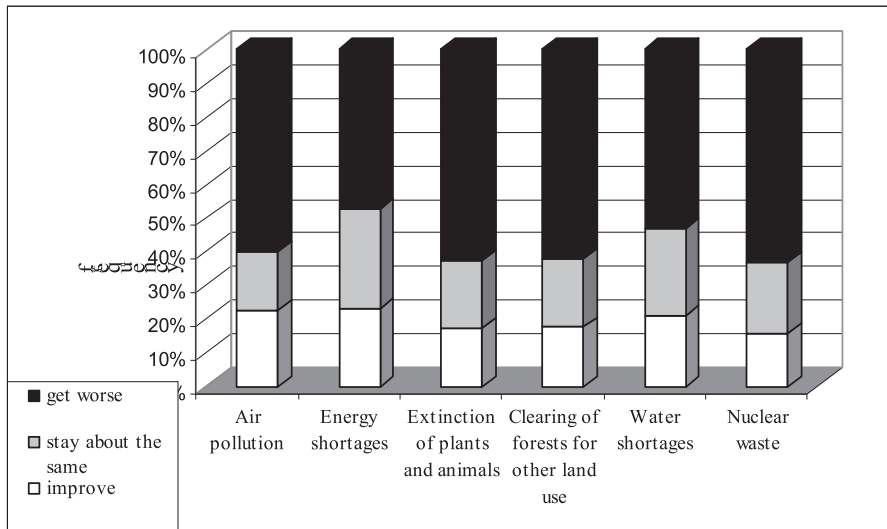


Figure 3. Students' optimism concerning the development over the next 20 years

3.1.4. Responsibility for sustainable development (RESPDEV)

Students' level of agreement for 7 possible sustainable development policies is depicted in figure 4.

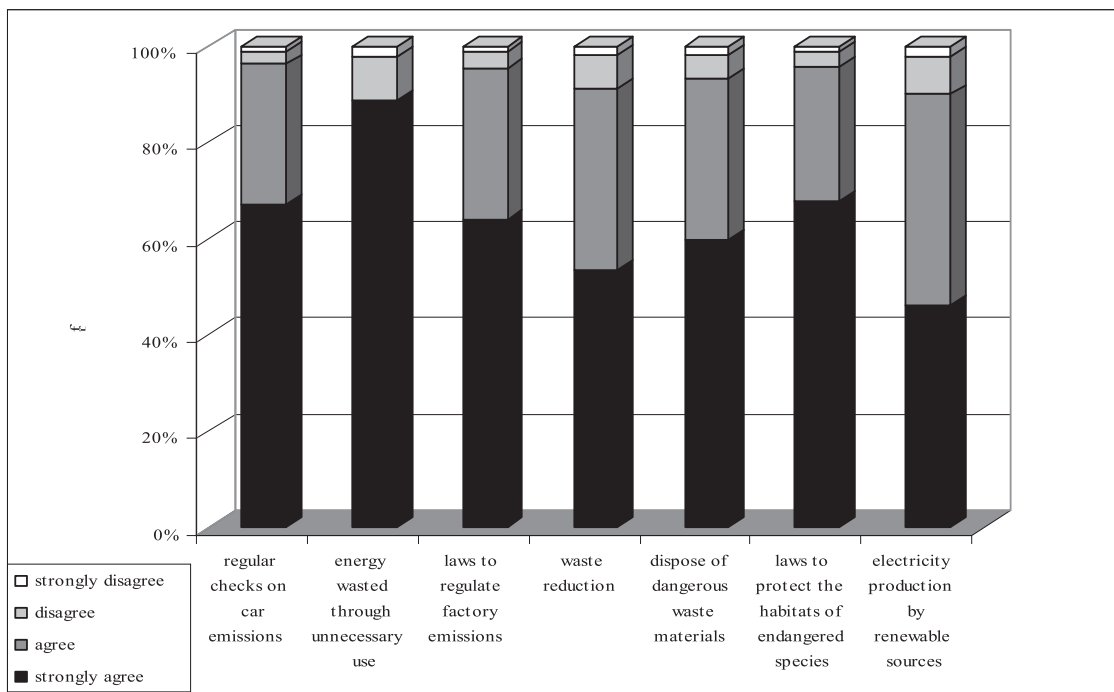


Figure 4. Students' responsibility for sustainable development

Generally students agreed on the items related to their responsibility for sustainable development. For example, more than 90% of them supported policies on the protection of the habitats of endangered species and the importance of regular checks on the emissions from cars, and over 80% agreed on the items about having laws to regulate factory emissions in spite of increase in the prices.

3.2. Differences in the students' responsibility toward natural resources and environment with respect to geographical regions

As presented in Table 1 and also in Figure 5, the mean scores for environmental perception, environmental awareness and responsibility development components show almost the same trend among the regions. Mean values for Aegean, Mediterranean, Marmara, Central Anatolia and Black Sea regions are higher than those for the Eastern Anatolia and South-eastern Anatolia Regions. Whereas, mean values for the environmental optimism component show a different pattern between the regions. As far as the mean values are considered, students in the Eastern Anatolia and South-eastern Anatolia Regions seem more optimistic than all other regions.

Table 1: Descriptive statistics for differences of students' responsibility towards natural resources and environment with respect to geographical provinces

Regions	ENVAWARE		ENVPERC		RESPDEV		ENVOPT	
	Mean	SD	Mean	SD	Mean	SD	Mean	SD
Marmara	0.017	1.03	0.91	0.806	0.701	1.059	-0.013	1.283
Central Anatolia	0.014	0.995	0.881	0.956	0.786	1.132	0.051	1.317
Aegean	0.207	0.959	0.99	0.751	0.848	1.046	-0.223	1.171
Mediterranean	0.208	1.012	0.99	0.756	0.62	1.354	-0.339	1.179
Black Sea	0.141	1.04	0.857	0.84	0.789	1.099	-0.247	1.194
Eastern Anatolia	-0.004	1.106	0.691	0.943	0.681	1.099	0.155	1.248
South-eastern Anatolia	-0.088	1.05	0.623	1.146	0.67	1.089	0.119	1.305

A clear picture can be seen from the Figure 5. The preliminary comment on this result may be related to the fact that, those regions in the Eastern part of Turkey are neither industrialized nor urbanized areas and thus they are not faced with the environmental problems that may make them pessimistic about their future. Furthermore, the students of these regions are not aware of the environmental problems both since they are not experienced them and they are not taught so.

3.4. Effect of geographical provinces on students' responsibility towards resources and environment

A multivariate analysis of variance was performed to assess if there were differences between the seven geographic regions group on a linear combination of students' awareness of environmental issues, level of concern for environmental issues, optimism regarding environmental issues, and responsibility for sustainable development. Total number of 4942 was reduced to 4890 with the deletion of missing scores. Results of evaluation of assumptions of normality, linearity, and multicollinearity were satisfactory. However, assumption of homogeneity of variance-covariance matrices are violated as Box's M test was significant at $p < .001$. Since sample sizes and variances for each region differed considerably, we decided to use Pillai's criterion instead of Wilk's lambda to evaluate multivariate significance as suggested by Tabachnick and Fidell (2007). After checking the key assumptions, a one way multivariate analysis of variance (MANOVA) was conducted to determine the effect of the geographical provinces on Turkish students' responsibility towards resources and environment. With the use of Pillai's criterion (.037), the combined dependent variables were significantly affected by geographical province, $F(4880, 19532) = 1027.98$, $p < .001$. The multivariate η^2 value of .009 indicated 0.9 % of multivariate variance of the dependent variables was associated with the geographical province. The results reflected a low association between geographical provinces and the combined dependent variables. Region had an influence to a lesser extent on awareness of environmental issues, level of concern for environmental issues, optimism regarding environmental issues and responsibility for sustainable development responsibility towards resources and environment. It is necessary to note that although significant, the effect size is relatively small. We can say that this difference was significant due to the large dataset.

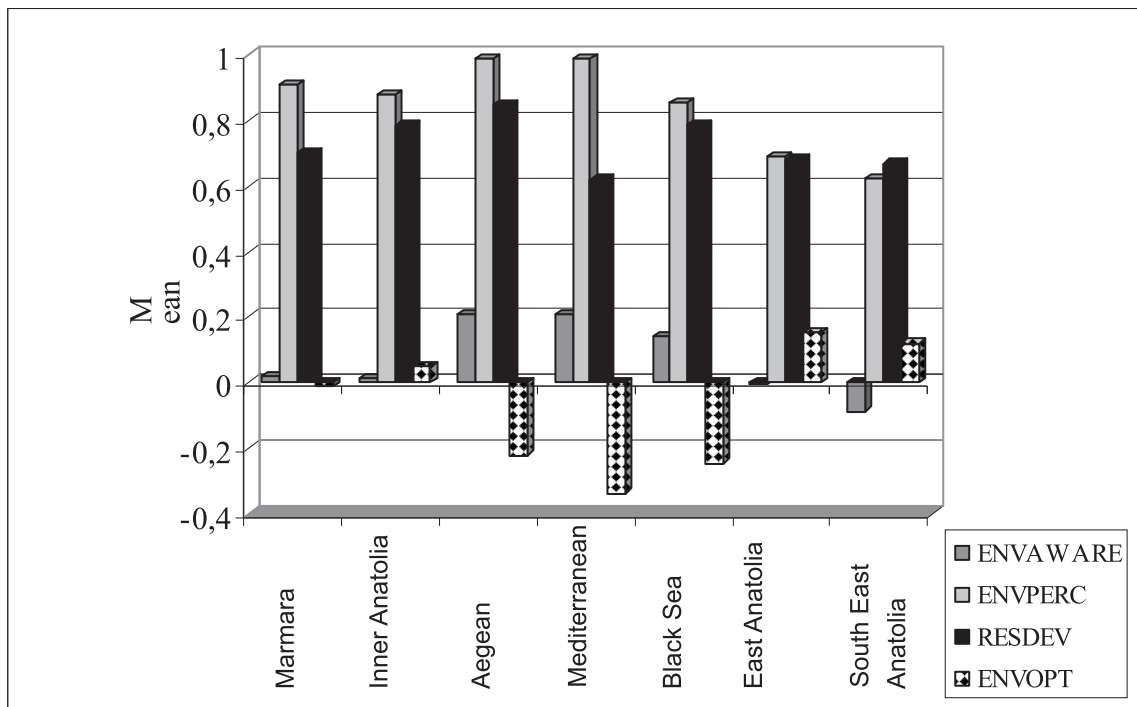


Figure 5: Distribution of students' responses with respect to geographical provinces

4. DISCUSSION AND CONCLUSION

The findings suggested that 15 years old Turkish students' responsibility towards resources and environment vary according to geographical regions of Turkey. In the first place, the results of the study provided some evidence that the place where students live had an effect on their environmental awareness, concern, optimism and responsibility for sustainable development. For example, the most noticeable characteristic related to the calculated mean values of the components for the seven geographical provinces of Turkey was that; although the students of the two of the least industrialized regions (Southeast Anatolia and East Anatolia) displayed lower awareness and concern toward environmental issues, they displayed highest degree of optimism concerning the development over the next 20 years of the problems associated with air pollution, energy shortages, extinction of plants and animals, clearing of forests for other land use, water shortages and nuclear waste. Concerning responsibility for sustainable development, on the other hand, while students living in the Aegean region exhibited the highest level of agreement, those of living in the Mediterranean displayed the least. In fact, these results reflect the transcontinental feature of Turkey. Among the 7 geographical provinces, Marmara having students with comparably higher environmental concern, responsibility but low degree of optimism, distinguishes from the others with its being heavily advanced in industry, commerce, tourism and transportation because of its close location to Europe. Thus the children living in such circumstances are more aware of the environmental problems, are concerned about them and pessimistic about the future state of the problems. The significant feature of Aegean, which has the students with very high environmental awareness, concern, responsibility toward environmental issues and comparably higher optimism, is that, most of the population and cities are concentrated on the coast line because of its convenience for sea transportation and tourism and it's also being both industrialized and agriculturalized. Students from one of the most important trading and tourism centre and the rapidly growing port, the Mediterranean region, on the other hand revealed high awareness and concern but lowest optimism toward environmental issues. The students from the Black Sea region, one of the most heavily forested regions with very rich fauna and flora, revealed a similar trend with the former regions. The students from plateau-like heartland of the country, Central Anatolia, revealed comparably higher perception, responsibility and optimism toward environmental issues are considered. The students showing a distinguished feature, lowest awareness, perception, responsibility

but highest optimism toward environmental issues, in the current study come from the Eastern Anatolia, the population and habitat not dense because of the harsh climate and high mountains and has the highest unemployment rate in Turkey and South-eastern Anatolia where a special atmosphere exists throughout, uniquely different from other parts of the country, thus, reflecting a specific life style over its land. Thus, referring the very well known phrase of the environmental studies, *think globally act locally* (UNEP, 1972), efforts to explain environmental perceptions and concern as a function of social structure and socio-demographic characteristics can be combined with the regional features of a country and such a relationship, if any, is valuable for strategy development for developing environmental perceptions. Thus, as Matthews (1995) reviewed in his study, regional features and culture affect children's behavior in large-scale environments and it follows that as the life worlds of children from different socio cultural backgrounds differ, the way in which children encounter place and make sense of their everyday worlds are also likely to be at variance.

It can be concluded that the results of the current study supports the idea that “area of residence is a silent predictor of responsible environmental behavior”. Therefore, after finding the difference between the geographical regions in Turkey, as far as the 15 years old students’ awareness, concern, optimism and responsibility toward the environment is concerned, it is needed to integrate regional socio-economical features with the students’ perceptions towards environment. Such an evaluation will be very valuable leading the education specialists to establish a national strategy for developing environmentally literate generations and will help to make the strategy regional, as suggested in Chapter 36 of Agenda 21 (UNCED, 1992).

6. RECOMMENDATION

We recommend taking the data of the current study as a base for further research and strategy development studies to develop a national strategy for environmental education in Turkey. We also suggest revising the data and related evaluations for each year depending on the PISA test results, so as to have a data set on the development on environmental perceptions of the school children in Turkey. We believe that integrating socio economic and cultural features of the regions with the results of the current study will be very useful to construct the above mentioned data set in Turkey. And we also believe that it is the time for gathering the all data and information related to environmental perceptions of the Turkish students’ together to comprise a data set and start a combined work for constructing a national strategy to develop the current state in Turkey.

REFERENCES

- Alp E., Ertepinar, H., Tekkaya, C. & Yılmaz, A. (2006). A Study on children’s environmental knowledge and attitudes: the effect of grade level and gender. *International Research in Geographical and Environmental Education*, 15(3), 210-223.
- Alp E., Ertepinar, H., Tekkaya, C. & Yılmaz, A. (2008). A Study on elementary school students’ environmentally friendly behaviours and associated variables. *Environmental Education Research*, 14(2), 129-143.
- Bogner F, X. & Wiseman, M. (1997). Environmental perception of rural and urban pupils. *Journal of Environmental Psychology*, 17(2), 111-122
- Bradley, J. C., Waliczek, T. M., & Zajicek J. M. (1999). Relationship between environmental knowledge and environmental attitude of high school students. *Journal of Environmental Education*, 30(3), 17-21.
- Chu, H. E., Lee, E. A., Ko, H. R., Shin, D. H., Lee, M. N., Min, B. M., & Kang, K. H. (2007). Korean year 3 children's environmental literacy: A prerequisite for a Korean environmental education curriculum. *International Journal of Science Education*, 29, 731-746.
- DeChano L. M. (2006) A multi-country examination of the relationship between environmental knowledge and attitudes. *International Research in Geographical and Environmental Education*, 15(1), 15-28.
- Gambro, J., & Switzky, H. (1999). Variables associated with American high school students’ knowledge of environmental issues related to energy and pollution. *Journal of Environmental Education*, 30(2), 15-22.
- Grodzinska-Jurczak, M., Stepska, A., Nieszporek, K. & Bryda, G. (2006) perception of environmental problems among pre-school children in Poland. *International Research in Geographical and Environmental Education*, 15(1), 62-76

- Hsu, S., & Roth, R. E. (1998). An assessment of environmental literacy and analysis of predictors of responsible environmental behaviour held by secondary teachers in the Hualien area of Taiwan. *Environmental Education Research*, 4(3), 229-299.
- Kuhlemeier, H., Van Den Bergh, H., & Lagerweij, N. (1999). Environmental knowledge, attitudes, and behaviour in Dutch secondary education, *The Journal of Environmental Education*, 30(2), 4-14.
- Mathews, H. (1995). Culture, environmental experience and environmental awareness: making sense of young Kenyan children's views of place. *The Geographical Journal*, 161, 285-295.
- Negev, M., Sagy, G., Garb, Y., Salzberg, A., & Tal, A. (2008). Evaluating the environmental literacy of Israeli elementary and high school students. *The Journal of Environmental Education*, 39(2), 3-20.
- Organization for Economic Cooperation and Development. (2007). *PISA 2006 – Science competencies for tomorrow's world* (Vol 1: Analysis). Paris: Author.
- Ozden, M. (2008). Environmental awareness and attitudes of student teachers: An empirical research. *International Research in Geographical and Environmental Education* 17(1), 40-55.
- Said, A.M, Yahaya, N & Ahmadun, F.(2007) Environmental comprehension and participation of Malaysian secondary school students. *Environmental Education Research*, 13(1), 17-31.
- Tabachnick, B. G., & Fidell, L. S. (2007). *Using multivariate statistics*. USA: Harper Collins College Publishers.
- Tikka, P. M., Kuitunen T. M., & Tynys M. S. (2000). Effects of educational background on students' attitudes, activity levels, and knowledge concerning environment. *The Journal of Environmental Education*, 31(3), 12-19.
- United Nations Commission for Environment and Development (UNCED). (1992). *Agenda 21, the United Nations programme of action from Rio*. New York: United Nations.
- UNEP (1972). *United Nations Conference on the Human Environment*. Retrieved from United Nations: <http://www.unep.org/Documents.Multilingual/Default.asp?DocumentID=97>
- Worsley, A., & Skrzypiec, G. (1998). Environmental attitudes of senior secondary school students in South Australia. *Global Environmental Change*, 8, 209–255.

GENİŞLETİLMİŞ ÖZET

Çevrenin ve buna bağlı doğal kaynakları korumanın en önemli araçlarından birisinin çevre eğitimi olduğu tüm dünyada tartışmasız kabul edilmektedir. Bu çerçevede yapılan araştırmalar çalışmacıları, doğal çevrenin kalitesi konusunda bireysel ve sosyal farkındalık ve bunu takip eden kaygıların, çevreyi korumanın merkezindeki temel unsurlar olduğunu ortaya koymaktadır. Bu çalışmanın amacı Türkiye'nin farklı coğrafi bölgelerinde yaşayan 15 yaş grubu öğrencilerin çevreye ve kaynaklara olan sorumluluk bilinçleri arasında fark olup olmadığını araştırmaktır. Araştırmanın veri kaynağını ve örneklemini 2006 Uluslararası Öğrenci Değerlendirme Programı (PISA) kapsamında Türkiye'nin 7 coğrafi bölgesinde, 78 ildeki 160 devlet ve özel okula okuluna devam etmekte olan 15 yaşındaki toplam 4942 öğrenciden (2290 kız, 2652 erkek) elde edilen veriler oluşturmaktadır. Öğrencilerin devam ettikleri sınıf düzeylerine göre dağılımları ise şu şekildedir: 7. sınıf (n = 23), 8. sınıf (n = 93), 9. sınıf (n = 2007), 10. sınıf (n = 2671) ve 11. sınıf (n = 148). PISA 2006'da öğrencilerin çevreye ve kaynaklara olan sorumluluk bilinçleri dört indeks değişkeniyle ölçülmüştür. Bunlar; (i) öğrencilerin çevresel sorunlara yönelik farkındalık indeksi (ENVAWARE), (ii) öğrencilerin çevresel sorunlara yönelik kaygı indeksi (ENVPERC), (iii) öğrencilerin çevresel sorunlara dair iyimserlik indeksi (ENVOPT), ve (iv) öğrencilerin çevresel sürdürülebilirlik için sorumluluk indeksi (RESPDEV). Türk örneklemini için ENVAWARE, ENVPERC, ENVOPT ve RESPDEV için Cronbach Alpha güvenilirlik değerleri sırasıyla 0.71, 0.83, 0.87 ve 0.81 olarak bulunmuştur.

Verilerin analizinde ilk olarak öğrencilerin bahsedilen indeksleri oluşturan sorulara verdikleri yanıtların frekans dağılımları yapılmıştır. Ayrıca, ENVAWARE, ENVPERC, ENVOPT ve RESPDEV indeksleri bağımlı değişken, öğrencinin içinde bulunduğu coğrafi bölgede bağımsız değişken olarak alınarak tek yönlü çoklu varyans analizi (MANOVA) yapılmıştır. MANOVA yapılırken veriler PISA 2006 veri tabanındaki son öğrenci ağırlıkları (W_FSTUWT) kullanılarak ağırlıklandırılmıştır.

Bazı çevresel sorunlar hakkındaki bilgileri konusundaki inanışları incelendiğinde, arazinin başka amaçlarla kullanılması için ormanların yok edilmesinin sonuçlarının 15 yaş grubu öğrencilerinin en çok aşına oldukları konu olduğu, nükleer atıklar konusunun ise öğrencilerin hakkında az çok bir şeyler duydukları konuların başında geldiği bulunmuştur. Öğrencilerin çoğu tarafından hiç duyulmayan konuların başında ise atmosfere yayılan sera gazlarının geldiği gözlenmektedir. Öte

yandan 15 yaş grubu öğrencilerin çoğunluğunun, çevreye verilen zararların insanlara tekrar zarar olarak döneceği yönünde kaygıları olduğu ortaya çıkmaktadır. Bununla birlikte, öğrencilerin bazı çevre sorunlarının gelecekteki eğilimleri konusundaki düşünceleri incelendiğinde, 15 yaş grubu öğrencilerinin çevresel sorunlar karşısında iyimserlikten çok uzak olduklarını görmekteyiz. Öte yandan 15 yaş grubu öğrencilerin, çevresel sürdürülebilirlik için kendilerine düşen sorumluluklar konusunda genel olarak hemfikir olduklarını görmekteyiz. Örneğin, öğrencilerin %90'dan fazlası nesli tükenmekte olan hayvanların doğal ortamlarının korunması, otomobillerin düzenli olarak emisyon ölçümlerinin yapılması gibi politikaları desteklemektedir.

Öğrencilerin çevresel sorunlara yönelik farkındalıkları, kaygıları ve çevresel sürdürülebilirlik için sorumluluk inanışlarının bölgelere göre dağılımları benzerlik göstermektedir. Ege, Akdeniz, Marmara, İç Anadolu ve Karadeniz bölgelerindeki öğrencilerin, Doğu Anadolu ve Güneydoğu Anadolu bölgelerindeki öğrencilere göre çevresel sorunlar hakkında daha fazla farkında ve kaygılı oldukları, çevresel sürdürülebilirlik için kendilerini daha sorumlu hissettikleri bulunmuştur. Diğer taraftan, öğrencilerin çevresel sorunlara karşı iyimserlikleri konusunda tam tersi bir tablo gözlenmektedir. Doğu Anadolu ve Güneydoğu Anadolu bölgelerindeki öğrencilerin, diğer bölgelerdeki öğrencilere göre daha iyimser oldukları bulunmuştur. Ayrıca, MANOVA sonuçları incelendiğinde, büyüklük olarak küçük de olsa, coğrafi bölge farklılıklarının öğrencilerinin doğal kaynak ve çevre ile ilgili sorumluluk anlayışlarında etkili olduğunu göstermiştir. Diğer bir deyişle, öğrencinin hangi bölgede yaşadığı, çevresel sorunlara yönelik farkındalıkları, kaygıları, iyimserlikleri ve çevresel sürdürülebilirlik için sorumluluk inanışlarını da etkilemektedir. Örneğin, en az endüstrilemiş iki bölgemiz olan Doğu ve Güneydoğu Anadolu bölgelerindeki 15 yaş grubu öğrenciler, diğer bölgelerdeki öğrencilere göre çevre sorunlarına karşı daha az farkındalık ve kaygı göstermektedir. Bununla birlikte bu iki bölgedeki 15 yaş gurubu öğrencilerimiz, hava kirliliği, enerji eksikliği, hayvan ve bitki türlerinin yok olması, başka türlü kullanımlar için ormanların kesilmesi, susuzluk ve nükleer atıklar gibi konularda diğer bölgelerdeki öğrencilere göre önümüzdeki 20 yılda daha iyimser gelişmeler olacağını düşünmektedir. Çevresel sürdürülebilirlik konusunda sorumluluk duygusu Ege bölgesindeki öğrencilerde en yüksek iken, Akdeniz bölgesindeki öğrencilerde en az olduğu bulunmuştur. Aslında bu sonuçlar, Türkiye'nin kıtalararası özelliğini de yansıtmaktadır. Yedi coğrafi bölge arasında Avrupa'ya en yakın Marmara bölgesindeki öğrencilerin çevresel sorunlara yönelik daha kaygı ve sorumluluk taşımalarına karşın daha az iyimser olmaları, bölgenin endüstri, ticareti turizm ve ulaşımda hayli gelişmiş olması ile açıklanabilir. Çevresel sorunlara yönelik yüksek farkındalık, kaygı ve sorumluluk belirten, bunun yanı sıra göreceli olarak daha iyimser öğrenciler barındıran Ege bölgesinin en önemli özelliği ise şehirleşmenin ve nüfusun yoğunlukla endüstrileşmenin ve tarımın yoğun olduğu, bunun yanı sıra ulaşım ve turizm için daha elverişli olan kıyı şeridinde yoğunlaşmasıdır. Diğer bölgelerdeki 15 yaş gurubu öğrencilerin çevreye ve kaynaklara olan bilgi ve sorumluluk bilinçleri bölgesel bazı karakteristiklerle açıklanabilir. Bu nedenle, çevreyle ilgili algı ve kaygıları sosyal yapı ve sosyo-demografik niteliklerle açıklamaya çalışırken ülkedeki bölgesel özellikler ile birleştirilebilirse, çevre bilincinin gelişmesi yönünde atılacak adımlar açısından önemli bir strateji olacaktır.

Bu çalışmanın sonuçları, ikamet edilen bölgenin sorumlu çevre bilincinin değişkenlerinden biri olduğunu desteklemektedir. Bu nedenle, 15 yaş grubu öğrencilerin çevresel sorunlara yönelik farkındalıkları, kaygıları, iyimserlikleri ve çevresel sürdürülebilirlik için sorumluluk inanışları göz önüne alındığında öğrencilerle ilgili bölgesel sosyo-ekonomik faktörlerde göz önünde bulundurulmalıdır. Bu tür değerlendirmelerin çevresel okuryazarlığa sahip nesiller yetiştirme konusunda ulusal stratejilerin geliştirilmesinde ve bu stratejilerin bölgeselleştirilmesinde eğitim uzmanlarına değerli katkılar sağlayacağı şüphesizdir.