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Contents

Abstract

The aim of this study is to develop a general attitude scale about environmental issues (GASE) for students in different grade levels. The research was carried out with the total 1225 students; 409 (33.4%) were primary school students in grades 5, 6, 7 and 8; 408 (33.3%) of the students were in grades 9, 10, 11 and 12 at high schools and the remaining 408 (33.3%) students were undergraduates at a university in Artvin. The study consists of five parts including a literature review, item pool, experts' opinions, administration of scale and computing the reliability and validity. While constituting the pool of items, 21 students in different levels were asked to write a composition related to the environment and environmental issues. A pool of 46 items has been performed, which are directly concerned with

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the subject of attitude or accepted to be interested in, from the collected compositions. These were edited to 36 items by the opinion of the experts and the five point Likert draft scale. The draft scale was administered to 1,225 students and as a result of factor analysis, the number of items was reduced to 27. The Cronbach-Alpha internal integrity coefficient of the final version of the scale was found to be 0.88 after factor analysis was carried out. After computing the reliability of GASE, the scale is ready to be used.

Keywords: Environmental education, environmental issue, Attitude, environmental issues attitude, students

Introduction

Humans continue to engage environmental damage behaviors at the individual, corporate, governmental and societal levels. These behaviors contributed to the creation of several environmental problems, which may expose serious threats to the health of humans and all living species (Gore, 1993). While it is thought that the main source of many environmental problems is irresponsible behaviors of people on the environment, it is important that humans have awareness of environmental problems. This is a fact that human beings need to raise awareness of environmental problems as a result of necessary trainings.

Educational endeavours increasingly began to be seen as a means for increasing humans' environmental knowledge, and in turn, effecting change and addressing environmental problems (Stapp, 1969; Ramsey & Rickson, 1976). Environmental education is crucially needed to prepare students who would play an active role in protecting the environment through making informed decisions and taking environmental friendly behavior (UNESCO–UNEP, 1991). One of the objectives of environmental education was working towards the resolution of environmental problems. Furthermore, environmental education should provide individuals and social groups with an opportunity to be actively involved at all levels (Stapp, 1969; Roth, 1970; UNESCO, 1980; Roth, 1992). The goal of environmental education is to challenge and require setting objectives at the cognitive, metacognitive, affective and behavioral levels (Sanera 1998). An additional goal is to make all people more sensitive about environment and environmental protection by helping them to develop positive attitudes, emotions, thoughts or behaviors about the environment (Şimşekli, 2001; Erten at al., 2003; Özmen et al., 2005; Erol & Gezer, 2006).

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Researchers put forward that environmental education, given in both a formal and informal system of education, helps to protect and conserve the environment and enables people to lead quality lives. In an informal system of education, teaching environmental education depends on not only on the curriculum, but also on the quality of teachers in terms of knowledge, awareness, attitude and skills relating to environmental education (Larijani & Yeshodhara, 2008). Therefore, an ultimate goal of this process is to effect students' decisions and behaviors (Makki, Abd-El-Khalick & Boujaoude, 2003). In a formal system of education, one aim of environmental education is that students gain environmental consciousness (Ozmen & Karamustafaoglu, 2006). For this reason, during the past decade, researchers have considered the nature of environmental education that takes place in schools, colleges and universities (Iozi 1989, Palmberg & Kuru 2000, Shin 2000).

Environmental education is about to receive a major boost in primary, secondary schools and universities. During the last decade, Turkey's national curriculum was amended to include science and technology in primary education after 2005 (MNE, 2005). The formal science education curriculum for grades 4–8 prepared by the Ministry of National Education and includes five main topics such as the world and universe, matter and energy, living organisms and natural resources (MNE 2006). Concepts related to environmental issues are mainly taught when the topic of living organisms is considered. Most curriculums worldwide try to explain knowledge about environmental issues (NRC, 1996; MNE, 2005; 2006). For example, water pollution, the dirtying of sea and rivers by chemical and nuclear wastes; air pollution, the dirtying of the air through toxic gas from factory chimneys, automobiles and the carbon dioxide from the consumed fossil fuels; soil pollution, the dirtying of soil resulting from the rubbish, acid rains, fertilizing and applying disinfectant; the extinction of animals and the plants by human kind; the perforation of ozone layer; the harmful sun rays for human beings; and global warming and climate change (Erten et al., 2003; Kızılaslan & Kızılaslan, 2005; Ozmen & Karamustafaoglu, 2006).

These environmental issues are presented in many grades in an effort to increase students' understanding (NSES, 1996; MEB, 2004; 2005; 2006; Yılmaz, Boone & Andersen, 2004). Furthermore, students were taught about these concepts related to environmental issues in primary school, high school and university. Students at different levels learned about environmental issues in schools. Not only is

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education about environmental issues are not enough, but students must also be aware of environmental issues, which should give them a more positive attitude.

In psychology, it is believed that an individual's personal evaluations are more revealing of the person's attitude than what he or she claims to do (Eagly & Chaiken, 1993). Therefore, attitudes can be defined as favorable or unfavorable feelings toward a characteristic of the physical environment or toward a related problem (Ajzen & Fishbein, 1980). Besides, attitudes are commonly believed to be important to marketing because of an assumed causal link between attitudes, intentions and behavior (Hini, Gendall & Kearns, 1995). Furthermore, Loudon & Della Bitta (1993) state that attitudes have been directly related to behavioral change. "Behavioral change is a function of change in behavioral intentions...Changes in behavioral intentions are related to changes in attitudes" (p.422), therefore, the study of attitudes shows that people make evaluative judgments about a wide variety of targets and rely on these judgments, or attitudes, in deciding among several possible courses of action in the future (Crawley & Koballa, 1994). As it is understood from the definition, changes in students' behavior depend on changes in students' attitudes. Attitude scales are developed and used to determinate students' attitudes. It can be seen that many attitude scales have been developed in a variety of fields. One of these fields is environmental education.

When the literature is reviewed, it is possible to find many studies carried out on the environment, environmental education and environmental problems. These studies are generally related to students' attitudes towards the environment and the status of environmental education at the elementary, secondary and university level. As well as many of these it can be also encountered in studies related to environmental attitude scale. Some researchers such as Leeming, Bracken & Dwyer (1995), Smith-Sebasto & D'Costa (1995); Alp (2005); Berberoğlu & Tosunoglu (1995); Kuhlemeier, Bergh & Lagerweij, N. (1999); Bradley, Waliczek & Zajicek, (1999); Kara & Chan, (1996); Çetin (2002); Maki, A.E.Khalick, & Boujaoude, (2003); Pooley & O'Connor, (2000); Roth & Perez (1989); Topaloglu (1999); Tosunoglu (1993); Wiegel & Wiegel (1978); Thompson & Barton (1994); Leeming & Porter, (1997) have developed attitude scales to discover the environmental attitudes of students. Environmental attitude scales are designed to be applied to a wide range of the population and determine students' environmental attitude at elementary, middle, university and junior schools. But there are a few

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attitude scales about environmental issues that determine students' attitudes towards environmental issues (Şama, 2003; Özmen, Çetinkaya & Nehir, 2005; Yılmaz, Boone & Andersen, 2004).

Furthermore, these studies on environmental issues were focused on a specific educational level, such as only primary or secondary or university. Also there is no study that determines the different levels of students' attitudes towards environmental issues, which would help compare their attitudes. Therefore, this study enables us to reveal different levels of students' attitudes towards environmental issues. It is also thought that developing an attitude scale is very useful to researchers who study this subject.

The aim of this study is to develop an attitude scale about environmental issues for students at different education levels. The main problem is that the research presented focused on recognizing the environmental issues attitudes of the students, meaning determining the nature and basic characteristics of these attitudes. For this reason, we have proposed the following objectives:
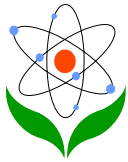
- To develop and validate an environmental issues attitude scale.

- To analyze the traits or specific facets that help to recognize the attitudes of students in different educational levels on environmental issues.

- To establish the viability of the scale for finding attitudes of students in different levels regarding environmental issues.

Methodology

In this study, an instrument was developed to define the attitudes of students in different grade levels towards the environment. This instrument development study was realized in the spring semester of 2009 academic year with the participation of 1,225 students in various grades in primary school, high school and university in Artvin in northeast Turkey.

Sample

The sample consisted of 8 primary schools with 409 (33.4%) students in grades 5, 6, 7 and 8; 3 high schools with 408 (33.3 %) students in grades 9, 10, 11 and 12; and 408 (33.3%) university students in grades 1, 2, 3 and 4. The sample of research

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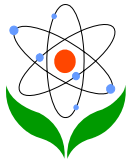A study on developing a general attitude scale about environmental issues for students in different grade levels

consists of 636 (51.9%) males. 207 (50.6%) of the males were in primary school, 225 (55.1%) were in high school and 204 (50%) were at the university level. Of the 589 (48.1%) women, 202 (49.4%) of them in primary school, 183 (44.9%) were in high school and 204 (50%) were at the university level. It was determined that 73 (17.8%) of students were in 5th grade, 98 (24%) were 6th grade, 118 (28.9%) of them were 7th grade and 120 (29.3%) of them were in 8th grade primary schools. 103 (25.2%) of the hight school students were 9th grade, 124 (30.4%) of them were in 10th grade, 139 (34.1%) of them were 11th grade and 42 (10%) of them were in 12th grade. Furthermore, It was determined that 206 (50.5%) of the university students were in their 1st year, 95 (23.3%) of them were in their 2nd year, 72 (17.6%) of them were in their 3rd year, and 35 (8.4%) of them were in there 4th year. Before administering the questionnaire to all participants, a pilot study was conducted to check the readability and comprehensibility of the questionnaire items by interviewing six students in different levels, five science teachers, four scientists and two Turkish teachers. By taking the students', teachers' and scientists' feedback into consideration, some minor revisions and modifications were made. Then, researchers visited each of the 14 schools and explained the purpose of the questionnaire, read the instructions aloud and answered any individual questions tthe students asked.

Development Process of Attitude Scale towards Environmental Issue

The environmental attitude scale is a five point Likert scale used to collect data from students in different grade levels. It followed five stages in the development of the scales.

In the first stage, many attitude scales towards the environment were examined in order to determine to statements of attitude towards environmental issues and how an attitude scale can be developed (Leeming, Bracken & Dwyer 1995; Smith-Sebasto & D'Costa 1995; Alp 2005; Berberoğlu & Tosunoglu 1995; Kuhlemeier, Bergh & Lagerweij, N. 1999; Bradley, Waliczek & Zajicek 1999; Kara & Chan 1996; Maki, A.E. Khalick, & Boujaoude 2003; Pooley & O'Connor 2000; Roth & Perez 1989; Topaloglu 1999; Tosunoglu 1993; Wiegel & Wiegel 1978; Thompson & Barton 1994; Leeming & Porter 1997; Sama 2003; Özmen, Çetinkaya & Nehir 2005; Yılmaz, Boone & Andersen 2004). After examining the results, 21 students in different grades were asked to write a composition about the environment and environmental issues. These essays helped constitute the item pool. There are seven students in each level who participated voluntarily in our

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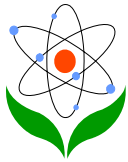A study on developing a general attitude scale about environmental issues for students in different grade levels

study. The aim of selecting students in different levels is to determinate suitable statements for all students. Students' composition assignments were given in an environment in which the students felt comfortable.

In the second stage, after writing compositions and reviewing, an item pool was developed which consisted of 46 statements about environmental issues. There were 23 positive and 23 negative statements in the item pool of draft attitude scale. These statements were placed together and seemed to reflect an underlying theme. This process resulted in three sets of 46 items each, which were preliminary indicators of possible scales. After deciding on the items, an initial item pool was generated and 46 items were put on a five-point rating scale using classificiations like "strongly disagree," "disagree," "undecided," "agree" and "strongly agree."

In the third stage, for the purpose of content validation, an initial draft of the instrument with 46 items on a five-point rating scale was given to a group of seven environmental education experts in the fields of biology education, educational psychology, and educational measurement. Their opinions helped determine whether the selected items were valid items for assessing students' attitudes toward environmental issues. The experts were asked to examine items with regard to their relevance to purpose of the instrument, content coverage, understandability and consistency among one another. Having received feedback from experts, ten items were deleted because they were found unsuitable in terms of clarity and students' education levels. At the conclusion of the third stage, the attitude scale towards environmental issues consists of 18 positive and 18 negative items on five-point rating scale.

In the fourth stage, the final draft of the attitude scale with 36 items was administered to 1,225 students in different grade levels for calculating validity (particularly construct validity) and reliability of the attitude scale. Students' responses were entered in an excel file created for further analyses.

In the last stage, the data collected from the 1,225 students in the study was analyzed by a means of factor analysis and reliability analysis through the use of SPSS 11.5. Firstly, In order to examine the factor structure behind the attitude scale, the data was subjected to factor analysis using the principle component method. The principal components factor analysis was followed by a varimax rotation (rotated component matrix). I thought that the variance explained by one factor would be independent of the variance in the other factors. For the validity of the

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GASE, it was calculated means and standard divisions of the upper 27% (330 students) and lower 27% (330 students) points and with t-tests between items' means of upper 27% and lower 27% points. Secondly, reliability analysis was performed for each of the emerged sub-scales, and the Croanbach alpha correlation coefficients were used. Then, the Croanbach alpha correlation coefficients were calculated among these factors.

Findings

After the attitude scale towards environmental issues was administered to 1,225 students, exploratory factor and item analysis was conducted to data gather from the attitude scale. Before conducting the factor analysis of the scale, the Kaiser–Meyer Olkin (KMO) measurement of sampling adequacy (KMO) and Barlett's test were calculated to evaluate whether the sample was large enough perform to apply a satisfactory factor analysis and was examined to determine appropriateness of factor analysis. The KMO sampling adequacy test statistic was 0.93. This value is higher than the threshold value of 0.5 (Kline, 1994; Tabachnick & Fidell 2007; Hair, et al., 1998, George & Mallery 2001). Barlett's test of Spherincity statistic was significant [8158.32 (p< 0.01)]. Results of KMO and Barlett's test appear to support the validity of the factor analysis usage for this study.

Exploratory Factor Analysis of the Scale

Exploratory factor analysis allows researchers to consider the set of variables with the least number of factors possible that, in turn, have a clear, unambiguous meaning (Bisquerra, 1989; Visauta, 1998). The objective of the exploratory factor analysis is to find the number of separate components that might exist for a group of items. An additional purpose of the exploratory factor analysis was to investigate the factors underlying the GASE in this study. The analysis of the data obtained from this larger study began by examining the dimensions obtained from the factor analysis of the data. So, the exploratory factor analysis was performed on the 36 items. First of all, it a principle components factor analysis was used on all the data in order to extract the appropriate number of factors. The initial solution revealed that 7 factors had an eigenvalue greater than 1. These factors altogether explained 45.2% of variance of results. Overall, five of seven factors were represented just by one item per each factor with loading higher than 0.4. Thus remaining two factors

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were considered not interpretable. Eight items were deleted because their factor loadings were lower than 0.4 (Kline, 1994; Büyük Öztürk 2004).

In summary, nine out of 36 attitude items were deleted and the factor analysis for rotation was run again over the data set with 27 items. Then, the varimax rotation was used. After using the varimax rotation, the factor loadings for each item were examined. Loadings of less than 0.40, a commonly-used cut-off, were eliminated. Thus, the factor analysis resulted in five independent factors with factor loadings greater than 0.4. Table 1 presents factor loadings and factor structures of the items. However, Kline (1994) highlighted that this method of determining the number of factors can overestimate the number of factors. An alternative approach to determine the appropriate number of factors is to examine the Scree plot produced by the analysis. The Scree plot shows that 5 factors were in sharp descent and then started to be level off. This was evidence that rotation was necessary for 5 factors. Each of the two methods to determine the number of factors revealed that the attitude scale towards environmental issues consists of five factors.

Table 1 *Factor Structures and Loadings of the 28 Items in GASE*

Number of Items		Factor 1	Factor 2	Factor 3	Factor 4	Factor 5
10	I closely monitor conferences related to environmental issues	.748				
32	I want to inform people about environmental issues	.671				
28	If people are given an environmental education, environmental issues are removed	.601				
20	I enjoy reading books and magazines on environmental issues	.581				
22	I enjoy watching documentary films related to plants and animals	.535				
9	I am bored by news related to environmental issues	.511				
8	I want to participate in nature protection clubs	.425				
31	Energy resources used and nature never is consumed		.669			
29	I don't believe in worldwide global warming		.614			

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23	The news about the debut desert of Turkey isn't true		.592			
27	It is unnecessary for civic community organizations to work on environment protection		.552			
33	Family planning doesn't prevent the increase of a rapidly growing population		.525			
17	Worldwide environmental issues are greatly exaggerated		.446			
21	Spiting out, rubbishing and butting do not cause any environmental problems.		.444			
26	I make the necessary self-sacrifices to imprive environmental issues			.707		
30	I am sensitive towards environmental issues			.661		
34	I willingly join activities to help save the environment, for example, planting a tree			.597		
18	I like feeding and protecting animals			.575		
24	II know to be useful to the environment. I make some self-sacrifice on consumer goods			.562		
14	I enjoy protecting and caring for plants			.510		
13	It is not important to cut trees in a farming region				.629	
15	The smell of perfume doesn't permanently cause air pollution				.569	
11	Recycling bins don't diminish environmental issues				.552	
5	Hormones and artificial insemination are needed in agriculture				.501	
7	It's useless to warn people about causing environmental pollution				.484	
4	It is harmful for the environment to build houses in forest areas					.686
3	It is necessary to protect endangered species					.456
	Eigenvalues	3.706	3.121	2.552	2.144	1.257
	% of Variance	12.951	11.33	9.71	7.12	5.007
	Total	46.118				

As seen table 1, there are five factors in the attitude scale. Factor 1 explained 12.951% of total variance, factor 2 explained 11.33% of total variance, factor 3 explained 9.71% of total variance, factor 4 explained 7.12% of total variance and factor 5 explained 5.007% of total variance. These five factors explained 46.118%

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of the total variance and were named according to the common characteristics of the items loaded on the same factor. This value is appropriate considering that other works focused on attitudes showed lower explained variance (Spinner & Fraser 2005: 42%, Kline 1994: 41%). Eigenvalues of the factors are 3.706, 3.121, 2.552, 2.144 and 1.257. According to results of item loading and Eigenvalues of the factors, it is said that this attitude scale is appropriated to assess attitude scale towards environmental issues for students in different levels.

After the factor numbers of GASE were determined, the 27 items were distributed among five factors.

Factor 1 includes seven items: 8, 9, 10, 20, 22, 28 and 32. These items explicitly measure students' attitudes towards willingness to learn and inform people about environmental issues. Therefore this factor was named "willingly to learn and inform about environmental issues (WLİE)." Factor 2 includes seven items: 17, 21, 23, 27, 29, 31 and 33. These items explicitly measure students' attitudes towards disbelief in the explanations related to environmental issues. This factor was named "disbelief in the explanations related to environmental issues (DERE)." Factor 3 includes five items: 14, 18, 24, 26, 30 and 34. These items explicitly measure students' attitudes towards willingness join activities towards saving environment and sensitivity towards environmental issues. This factor was named "sensitivity towards environmental issues and saving the environment (SEA)." Factor 4 includes five items: 5, 7, 11, 13 and 15. These items explicitly measure students' attitudes towards disbelief in air and soil pollution. This factor was named "disbelief in environmental pollutions (DEP)." Factor 5 includes two items: 3 and 4. These items explicitly measure students' attitudes towards belief in the necessity to protect foster and vanishing species. This factor was named as "belief in protecting habitat (BPH)."

Item Analysis of the Scale

After the exploratory factor analysis, the means and standard divisions of the upper 27% and lower 27% points and P value and t-tests between items' means of upper 27% and lower 27% points in item analysis of the scale for validity of the GASE items were calculated. Table 2 presents means and standard divisions, P value and t-tests between items' means of the upper 27% and lower 27% points in an item analysis of the scale.

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Table 2 *means, standard divisions, P value and t-tests means of upper and lower points*

Number of Items	Upper 27%		Lower 27 %			
		SS		SS	t	p
10	3.97	.972	2.69	1.267	14.512	.000
32	4.53	.629	2.83	1.296	21.399	.000
28	4.39	.851	2.83	1.352	17.747	.000
20	4.25	.858	2.77	1.286	17.409	.000
22	4.58	.753	2.89	1.351	19.857	.000
9	4.42	1.089	2.99	1.333	15.090	.000
8	4.47	.872	2.91	1.305	18.100	.000
31	4.53	.872	3.07	1.367	16.366	.000
29	4.55	1.116	2.85	1.336	17.744	.000
23	4.56	.881	2.89	1.324	19.107	.000
27	4.81	.547	3.05	1.301	22.696	.000
33	4.12	1.123	2.86	1.344	13.105	.000
17	4.45	.989	2.78	1.249	19.040	.000
21	4.87	.568	3.05	1.416	21.606	.000
26	4.58	.662	2.95	1.269	20.765	.000
30	4.64	.662	2.68	1.242	25.191	.000
34	4.43	.750	2.81	1.313	19.482	.000
18	4.43	.873	2.75	1.331	19.120	.000
24	4.47	.825	2.85	1.215	20.011	.000
14	4.57	.686	2.95	1.346	19.417	.000
13	4.69	.861	3.14	1.378	17.410	.000
15	4.57	.863	3.01	1.353	17.740	.000
11	4.52	.879	2.85	1.285	19.376	.000
5	4.38	1.037	3.22	1.363	12.343	.000
7	4.61	.965	2.94	1.415	17.707	.000
4	4.35	1.178	3.05	1.397	12.921	.000
3	4.92	.390	3.48	1.474	17.155	.000

$\bar{x}$: Means, SS: Standard divisions, P<0.01

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Reliability of the attitude scale

Reliability analysis was performed for each factor, and croanbach alpha correlation coefficients were used. Then, the croanbach alpha correlation coefficients were calculated among these factors. Table 3 summarizes factor names, number of the items and reliability of each factor.

Table 3 *Factor names, number of the items and croanbach alpha value of each factor*

Factors name	Number of items	Coefficient items Cronbach Alpha
Williness to learn and inform about environmental issues (WLİE)	7	0.71
Disbelief in explanations related to environmental issues (DERE)	7	0.76
Sensitivity towards environmental issues and saving the environment (SEA)	5	0.77
Disbelief in environmental pollution (DEP)	5	0.70
Belief in protecting Habitat (BPH)	2	0.55
Total Scale	27	0.88

As seen table 3, it was determined that croanbach alpha value of WLİE is 0.71, DERE is 0.76, SEA is 0.77, DEP is 0.70 and BPAL is 0.55. Also, it was found that the croanbach alpha value of total scale (GASE) is 0.88. According to these results, generally the attitude scale towards environmental issues is a valid and reliable scale.

Conclusions

The aim of this study is to develop an attitude scale towards environmental issues for students in different grade levels. In this study, the GASE was developed through the use of a five-stage model proposed by the authors. Subsequent to an extensive review of literature and compositions written by students, the item pool was composed, validated by experts and then an initial draft of the instrument was constructed. Later, this initial draft was reviewed by the experts (on Environmental

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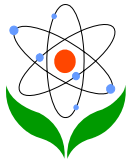
education, biology education, educational psychology, and educational measurement), the GASE was administered to 1,225 students in different grade levels. The factorial structure of the scale provided validity and further reliability evidences. Lastly the validity (particularly construct validity) and reliability of the attitude scale were calculated.

The 27-item GASE was found to measure five dimensions of environmental issues. The GASE was also subjected to factor analysis, for exploring factor structures, and reliability analyses, for investigating reliability of each factor. The results of the factor analyses reveal that there are five factors for the attitudes towards environmental issues. With these aspects, this study differs from previous studies in terms of the development of the environmental issues with five clearly defined factors.

- Factor 1: Willingness to learn and inform about environmental issues (Item 8, 9, 10, 20, 22, 28 and 32)

- Factor 2: Disbelief in explanations related to environmental issues (Item 17, 21, 23, 27, 29, 31and 33)

- Factor 3: Sensitivity towards environmental issues and saving the environment (Item 14, 18, 24, 26, 30 and 34)

- Factor 4: Disbelief in environmental pollution (Item 5, 7, 11, 13 and 15)

- Factor 5: Belief in protecting Habitat (Item 3, 4)

Factor analysis with principle component methods revealed seven factors behind GASE which explain 46.114% of the total variance together. These factors were named according to the characteristics of the items loaded on that factor. Also, the means and standard divisions of upper 27% and lower 27% points were calculated, and the P value and t-tests between items' means of the upper 27% and lower 27% points in item analysis of the scale for the validity of the GASE items. The t-test results showed significant differences between each items' means of the upper 27% and lower 27% points. According to this result, it was decided that 27 items of the GASE are appropriate to measure students of different levels attitudes' towards environmental issues. In addition to croanbach alpha correlation, coefficients of five factors were calculated using Cronbach's alpha reliability of the factors and ranged from 0.55 to 0.88, indicating acceptable reliability range (Kline 1994, Fraser
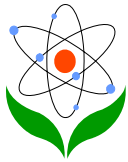
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1989; Büyük Öztürk, 2004) despite the low level reliability of Factor 5 (0.55). The internal consistency of "willingness to learn and inform about environmental issues" was 0.71, "disbelief in explanations related to environmental issues" was 0.76, "sensitivity towards environmental issues and saving the environment" was 0.77, "disbelief in environmental pollution" was 0.70 and "belief in protecting life" was 0.55. The overall scale reliability was calculated as 0.88. According to the results, we have identified five important factors in exploring students' attitudes towards environmental issues, students' willingness to learn and inform about environmental issues, disbelief in explaining related environmental issues, sensitivity towards environmental issues and saving environment, disbelief in environmental pollution and belief to protect life.

It is very important that students want to willingly learn and inform about environmental issues, sensitivity towards the environment and its protection, belief in the importance of explaining environmental issues, belief in environmental pollution and the belief that it is necessary to protect life. If Students have these aspects, they are aware of environmental issues and can be conscious about environmental issues. So, it is believed that the GASE is very useful attitude scale in order to measure these aspects.

It must be emphasized that the GASE, which allows researchers to study students in different grade levels attitudes' towards environmental issues, was developed. Many of the research conducted in the literature are limited to participants from a single level, such as elementary school, high school or university, but this study was carefully designed with respect to the diversity of participants from elementary school, high school or university. The authors intended to select students in different levels at these schools and of different genders (the number of males and females was balanced). So, the attitude scale comprehensive for students in elementary school, high school and university.

Researchers now have an attitude scale towards environmental issues in five dimensions, which contain different aspects of environmental issues for a better understanding. Of course, it is believed to be necessary to apply this scale in different countries to see whether it works similarly. It is believed that further validations would provide very fruitful information whether the scale can also be used for students. In addition, some dimensions that loaded with low number of items (two or five) should be further evaluated, and related items can be added to the questionnaire.

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The attitude scale that was developed in this study (GASE) will fill the gap in the literature related to environmental issues. Followed by the additional validation studies, the GASE will serve as a valuable tool for both instructors and researchers to assess students' attitudes towards environmental issues.
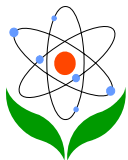
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