PRINT: ISSN 0975-1122 ONLINE: 2456-6322
Int J Edu Sci, 5(4): 415-424 (2013)
DOI: 10.31901/24566322.2013/05.04.08

# High School Students' Environmental Attitude: Scale Development and Validation

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**KEYWORDS** Environmental Attitude. Environmental Education. High School. Scale Development

**ABSTRACT** This study aimed to develop a valid and reliable instrument to be used for measuring high school students' attitudes toward environment and its applications. Data gathered from 350 high school students provided evidence for the validity and reliability of the new instrument which consists of 35 attitude items on a four point Likert type scale. Results of the factor analysis with varimax rotation showed that, items constituting Environmental Attitude Scale (EAS) grouped under four subscales: (1) Environmental awareness; (2) Attitudes towards recovery; (3) Attitudes towards recycling; (4) Environmental consciousness and behavior. Each environmental attitude item had a factor loading of at least 0.40 with its own scale. The alpha reliability coefficient for the subscales ranged from 0.70 to 0.84. According to these findings, the EAS is a valid and reliable instrument that can be used in the field of environmental and science education.

## INTRODUCTION

Humans continue to engage environmental unfriendly behaviors at the individual, corporate, governmental, and societal levels (Ugulu and Erkol 2013). These behaviors contributed, and continue to contribute to the creation and exacerbation of several environmental problems that might pose serious threats to the well-being of humans and all living species (Gore 1993). It is clear that individuals with negative attitudes towards the environment will be inconsiderate towards environmental problems and will continue to pose problems to the environment (Uzun and Saglam 2006). For this reason, environmental education is crucial to prepare environmentally literate students who, as future citizens, would play an active role in protecting the environment through making informed decisions and taking environmental friendly actions (UNESCO–UNEP 1991).

Environmental education is a long-term process of developing the skills and behavior necessary to understand and accept the relationships between people, culture and the natural environment. In addition, environmental education is a sequential process that attempts to increase understanding of the environment and promote pro-environmental values. Its ultimate aim is to motivate citizens to act individually and collectively in an environmentally conscious manner that balances the social, economic, and ecological needs of today without compromising those of the future (Hungerford et al. 1980; Yorek et al. 2010). It is a means to prepare society in practical decision making and to teach environmentally friendly behavior. It should, therefore, be a fundamental and integral part of education for all members of society. Environmental education syllabuses at all educational levels (both formal and informal) should be prepared so as to help achieve these aims (Grodzinska-Jurczak et al. 2006).

Current literature suggests that environmental education programs intending to encourage pro-environmental attitudes and behaviors and to develop a personal ecological knowledge base among participants should offer a variety of techniques and characteristics within various sequential stages (Farmer et al. 2007). Some suggested characteristics are as the following: (a) direct aesthetic experience with the natural environment (Gigliotti 1990), (b) environmental restoration activities to increase participant ownership (Hartig et al. 2001), (c) sensitive or emotional content (Pooley and O'Conner 2000), (d) a multi-sensory learning environment to promote student engagement (Smeesters et al. 2001), and (e) relevant and personal information that promotes empowerment and ownership (Hungerford 1996).

### Environmental Attitudes and Behavior

Attitudes, defined by social psychology as "favorable or unfavorable evaluations of and

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reactions to objects, people, situations, or any other aspects of the world," enable us to predict and change people's behavior (Atkinson et al. 1996: 606). Newhouse (1990) suggested that attitudes which are derived from life experiences and education, markedly influence behavior. It is often ascertained that one barrier for attitude change is insufficient information about a certain aspect of life, and that the strategy of choice to effect a change of attitude is exposure to new information (Oweini and Houri 2006).

Ajzen and Fishbein (1977) have argued more generally that attitudes and behavior should be measured at the same level of specificity, for attitudes to be predictive of behavior. More general attitudes may simply not be considered relevant for the specific behavior (for example, recycling) under study. Pieters (1989) mentions two additional limitations. First, attitudes and behavior need to be measured in close temporal proximity: the longer the time interval between the measurement of attitude and the measurement of behavior, the higher the probability that the attitude can change for some reason. Second, failure to find attitude-behavior consistency can be due to the fact that attitude is only one of the factors that influence behavior. Some of the suggested other determinants of behavior are social norms, prior behavior, and situational influences. Finally, theoretically attitudes are thought to influence intentions rather than the behavior itself (Ajzen and Fishbein 1977). Other situational constraints may intervene between the formulation of an intention and its realization in behavior (Smeesters et al. 2001; Ugulu 2011).

The literature contains several approaches defining what constitutes environmental attitudes. Psychosocial variables—including attitudes, personal responsibility, and locus of control—were one major category that emerged (Hines et al. 1986). Attitudes apply to general feelings toward ecology and the environment, feelings and concern for specific environmental issues, and feelings toward acting to remedy environmental problems. Personal responsibility represents the individual's sense of obligation toward the environment, either in general or to a specific aspect (for example, reducing air pollution or recycling). Locus of control represents individuals' perceptions of their ability to bring about environmental change through personal behavior. Someone who attributes change to external factors, not to personal behavior (external locus of control), will be less inclined to influence a situation. Internal locus of control describes people who believe in their ability to bring about change through personal actions (Peyton and Miller 1980; Hungerford and Volk 1990). One purpose in developing environmental literacy is to empower people with a belief in their ability to contribute to environmental solutions through personal behavior, either as an individual or part of a group (Peer et al. 2007; Mondéjar-Jiménez 2012).

Student attitudes affect individual's behavior, particularly their choice of action, and persistence to give a decision. For example, in schools, students who have high scientific literacy tend to choose more appropriate decisions and seem more knowledgeable (Ugulu 2011). In this direction, a direct relationship between environmental education and environmentally responsible attitudes and behaviors, while intuitively appealing, is far from clearly established (Vlaardingerbroek and Taylor 2007). Studies suggest that the relationship between cognitive and affective attributes is weak and non-linear (Myers et al. 2004). Despite the nebulous relationship between environmental knowledge and attitudes, it has been argued that positive environmental attitudes are associated with personal environmentally responsible behaviour (Scott and Gough 2003; Eilam and Trop 2012). Gender, age and socioeconomic status function as sources of variation for environmental attitudes (Worsley and Skrzypiec 1998; Erten 2012; Ozsoy 2012). Schooling, even at primary level, can play a significant role in the formation of environmental attitudes (Strong 1998; Kahriman-Ozturk et al. 2012). Teachers are accordingly instrumental factors in the formation of these attitudes (Said et al. 2003; Kandir et al. 2012). Schools are possibly better vehicles for improving environmental awareness than are universities as environmental issues are more readily incorporated across school curricula (Pearson et al. 2005; Arslan 2012; Ogunbode and Arnold 2012).

There are plenty of research available about environmental attitudes in the literature (Leeming et al. 1997; Bradley et al. 1999; Pooley and O'Connor 2000; Cetin 2002; Maki et al. 2003; Sama 2003; Yilmaz et al. 2004; Alp 2005; Uzun and Saglam 2006; Fernández-Manzanal et al. 2007; Aslan et al. 2008; Ozsoy 2012; Ugulu

and Erkol 2013). In a survey of pre-service science teachers' attitudes toward the environment, it was found that pre-service science teachers have positive attitudes toward the environment. In addition, females were reported to have more positive attitudes toward the environment than males (Ozsoy 2012). Another study reported that pre-service teachers' attitudes towards environmental problems were at moderate level and females had more positive attitudes towards environmental problems than males (Ugulu and Erkol 2013).

At university level studies gender difference in attitudes towards environment were apparent. For instance, in a study investigating undergraduate students' attitudes towards environment at the end of the course "Environment, Human, and Society" female students were found to be more sensitive toward environment than male students (Kose et al. 2011). Tuncer (2008) reported girls as more sensitive toward sustainable development and Fernández-Manzanal et al. (2007) reported significant differences between male students and female students on the factors need for conservation and environmentally favorable behavior. Females had higher scores on both factors.

Studies concerning elementary and high school students (Yilmaz et al. 2004; Jenkins and Pell 2006; Aslan et al. 2008) indicate gender difference in students' attitudes toward environment. Girls were found to have more positive attitudes toward environment and were more willing to take responsibility in environmental protection (Jenkins and Pell 2006). Data from the studies suggests a link between students' attitudes toward environment and their level of interest in learning about environmental topics. From this perspective, it is important to examine student attitudes in the evaluation of science curriculum and the development of planned behaviors (Bennett et al. 2007; Kahriman-Ozturk et al. 2012). Therefore, it is of utmost concern that environmental concepts included in the curriculum should be evaluated. In addition, investigation of factors affecting students to be responsible individuals towards their environment may have significant results. Finally, studying students' attitudes towards environment may provide help towards the solution of environmental problems (Ugulu and Erkol 2013).

For this purpose there are various kinds of environmental attitude scales commonly used (Leeming et al. 1997; Uzun and Saglam 2006; Fernández-Manzanal et al. 2007; Okur and Yalcin-Ozdilek 2012). Each of these scales developed for elementary to university students has its own features. As the literature review of this study reveals, environmental attitudes and behaviors differ in students at different levels of schooling. Scale development in environmental attitudes is seen to focus on university level. One will find that number of valid and reliable scales developed to measure high school students' attitudes toward environment is scarce (Uzun and Saglam 2006). This situation show that it may be useful to develop a more comprehensive environmental attitude scale for high school students in terms of both criteria that an attitude scale should possess reliability and validity concerns (Uzun and Saglam 2006). In this direction, this study, prepared for this purpose, reports on the development and validation of a multidimensional instrument to measure high school students' environmental attitudes. It is believed that the development of this instrument will provide a missing link in the study of environmental attitudes and will encourage research studies with a more comprehensive perspective.

## METHODS

### Sample

This study was realized in the spring semester of 2009–2010 academic year with the participation of 350 students from three high schools in a large western province of Turkey. Since "ecosystem ecology" is a topic of $10^{th}$ grade curriculum, the study has been carried out with $10^{th}$ grade students.

### Stages in the Development of the Environmental Attitude Scale (EAS)

"Environmental Attitude Scale" has been developed to determine high school students' attitude towards the environment. A six-stage model was used in the development of the EAS. These stages were illustrated in Figure 1.

#### *Stage 1: Development of Item Pool*

Before building up the item pool, a literature review was carried out and the question "what are your opinions about environment and recy-

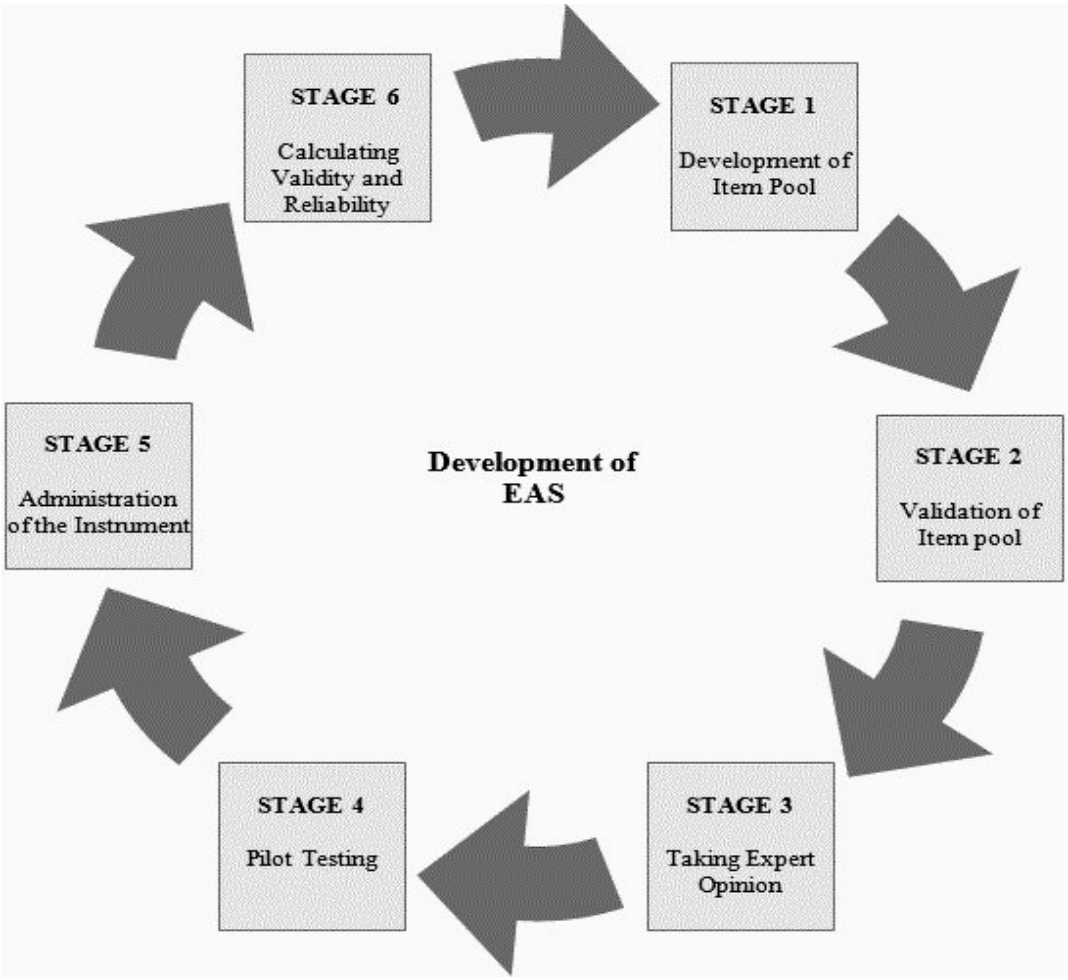


**Fig. 1. Development process of environmental attitude scale**

cling?" was asked to 65 high school students and they were required to write an essay expressing their opinions about this question. The responses of students to this question were listed as individual items. In addition to these items, a few items were adapted from environmental attitude instruments already developed and used in other studies (Leeming et al. 1997; Sama 2003; Uzun and Saglam 2006; Gokce et al. 2007; Aslan et al. 2008). As a result, an item pool consisting of 100 items has been developed.

### *Stage 2: Validation of Item Pool*

Draft items were sent to three specialists for formal review. Each item was placed into a matrix and then asked to be evaluated in terms of four areas: *content validity, clearity and understandability, accuracy and distracters*. In addition, numerous scales such as "Environmental Attitudes and Knowledge Scale" (Leeming et al. 1997; Aslan et al. 2008), "Environment Attitude Questionnaire for Elemantary School Students" (Gokce et al. 2007), "Environmental Attitude Scale" (Uzun and Saglam 2006), and "Environmental Attitude Scale" (Sama 2003) found via literature review were examined comprehensively. Based on expert thoughts on the list of items and examination of existing scales, some items were revised and some were left out. Finally, 60 items were kept to form the "environmental attitudes scale."

### *Stage 3: Taking Expert Opinion*

The experts (nine faculty members and five high school biology teachers) were then asked to examine the items with regard to their relevance to the purpose of the instrument, content coverage, understandability and consistency. Revisions were conducted in accordance with opinions and suggestions of the experts and three new items were added to the instrument. Content validity of the scale has been provided by the opinions of the experts. Consequently, a 63-item scale was created to be used in the pilot test.

### *Stage 4: Pilot Testing*

The pilot testing of the "Environmental attitude scale" has been carried out with a group of 30, 10$^{th}$ grade students attending high schools. During the administration, students were asked to mark the items which were difficult to understand. These items were worked on and revised after the pilot test.

### *Stage 5: Administration of the Instrument*

Final form of the 63-item "Environmental attitude scale" was administered to 350 10$^{th}$ grade students in state high schools in a large western province of Turkey during the spring semester of 2010.

### *Stage 6: Validity and Reliability Analyses*

The data collected from 350 high school students were analyzed by means of factor analysis and reliability analysis using SPSS (Statistical Package for the Social Sciences) version 15.0. First, to examine the factor structure of the instrument data were subjected to factor analysis with principle component method. Second, reliability analysis was performed on each of the emerged components.

## RESULTS

### Factor Structure of the Environmental Attitudes Scale (EAS)

In order to determine the factor structure of the EAS, principal components factor analysis method was utilized with varimax rotation. The eligibility of the data for factor analysis can be screened out with Kaiser-Mayer-Olkin (KMO) coefficient and Barlett Sphericity test. The fact that KMO value was over 0.60 and Barlett test was meaningful indicated the elegibility of data for factor analysis (Buyukozturk 2003). The KMO value was calculated as 0.819.

To be able to use the parametric methods, the feature to be measured must have normal distribution in the universe. Barlett Sphericity test is a statistical technique which can be used to check out whether the data comes from a multivariate normal distribution or not. A significant chi-square ($\chi^2$) test statistic obtained from this test indicates that the data comes from a multivariate normal distribution. Barlett test carried out in the current study was significant ($\chi^2 = 3432.77$; $p<0.00$).

Factor analysis has been carried out four times on the data. The reason for that was to eliminate the items whose item-scale correlation value was below 0.20 and whose factor loading was below 0.40. The processes in these four steps are given below:

*Step I.* As a result of the first factor analysis using varimax rotation, 13 factors with Eigen values over one were obtained. These 13 factors explained 59.70% of the total variance. Items (1, 2, 3, 5, 6, 7, 10, 14, 21, 31, 32, 34, 37, 38, 48, 55, 57, 58, and 60) whose item correlation values below 0.20 have been removed from the scale. The second factor analysis has been conducted on the remaining 44 items.

*Step II.* The second factor analysis resulted in 11 factors with Eigen values above one. Based on the suggestion that the variance explained in the second factor analysis must be 30% or more (Buyukozturk 2003) and an examination of the Scree plot, a four-factor solution was accepted. The four factors explained 40% of the total variance which is an acceptable value.

*Step III.* As a result of the third factor analysis, items 4, 8, 17, 28, and 33 whose factor loadings below 0.40 were removed from the scale.

*Step IV.* The 39-item scale was subjected to another factor analysis. As a result, the items 13, 42, 47, and 52 whose factor loadings below 0.40 were removed from the scale. Finally, the 35-item "Environmental Attitudes Scale" was developed. Table 1 presents factor loadings and factor structures of the items.

**Table 1: Results about factor structures and loadings of the EAS**

| *Items* | *F1* | *F2* | *F3* | *F4* |
|---|---|---|---|---|
| *Factor I (Environmental Awareness)* | | | | |
| The primary purpose of tree planting is to beautify the environment in terms of aesthetics | 0.659 | | | |
| Since the environment can clean itself, human waste does not cause a problem. | 0.649 | | | |
| Instead of spending money on historical places, it is more advantageous for us to build luxurious roads. | 0.625 | | | |
| Some species are unnecessary for the environment. | 0.624 | | | |
| The government should give permission for building, on touristic purpose, in national parks and forests. | 0.621 | | | |
| The media news about polluted seas, rivers and lakes are exaggerated. | 0.595 | | | |
| The extinction of the insects such as flies is useful for environment. | 0.579 | | | |
| Nature renews itself with substance cycle. Therefore, recycling helps economy only in terms of time. | 0.574 | | | |
| The best way to build houses is to dry up the wetlands and build there. | 0.562 | | | |
| -I do not think that recycling works as much as it is said. | 0.525 | | | |
| It is meaningless to buy paper bags instead of nylon bags given for free in the markets. | 0.524 | | | |
| People have the right to make changes in nature for meeting their needs. | 0.499 | | | |
| A land does not have desertification problem if it is surrounded on three sides by sea. | 0.489 | | | |
| Money can be saved by buying drinks in plastic bottles since drinks in glass bottles are expensive. | 0.441 | | | |
| I am curious about how the natural events occur. | 0.486 | | | |
| *Factor II (Attitudes Towards Recovery)* | | | | |
| Using rechargeable batteries instead of disposable batteries supports recycling. | | 0.675 | | |
| Giving old clothes to the people in need supports recycling. | | 0.669 | | |
| We should throw the used batteries and bottles into the appropriate trash bins. | | 0.645 | | |
| Using old newspapers for packing supports recycling. | | 0.595 | | |
| Shopping only as much as needed is an important step in recycling. | | 0.569 | | |
| I believe that we should be economical for environment. | | 0.556 | | |
| We should use both sides of white papers to support recycling. | | 0.541 | | |
| For saving energy, I turn off the lights in my house when they are not used. | | 0.470 | | |
| *Factor III (Attitudes Towards Recycling)* | | | | |
| I can go from door to door to teach people recycling. | | | 0.673 | |
| I separate waste materials in my house for recycling. | | | 0.657 | |
| I feel sad when I a see people throwing away objects that can be recycled. | | | 0.627 | |
| When I buy a product I pay attention whether its case is recyclable. | | | 0.521 | |
| It makes me happy when people recycle used bottles, cans and paper. | | | 0.511 | |
| *Factor IV (Environmental Consciousness and Behavior)* | | | | |
| For a livable environment, I can work voluntarily for a long time if needed. | | | | 0.647 |
| I do not waste water while I am brushing my teeth. | | | | 0.585 |
| I prefer environmentally harmless products even if they are more expensive. | | | | 0.492 |
| I participate in environmental projects. | | | | 0.490 |
| My friends know me as a sensible person towards environment. | | | | 0.487 |
| I talk with people around me on environmental matters. | | | | 0.453 |
| I can reutilize the back sides of used papers if possible. | | | | 0.409 |

## Description of the EAS Dimensions

According to the data obtained from factor analysis, it was seen that items constituting the EAS were grouped under four sub-scales. Eigen values of the four factors have been found as 5.351 for the first factor, 4.996 for the second factor, 2.095 for the third factor and 1.434 for the fourth factor Table 2 presents names, Eigen values and variance of factors

**Table 2: Factor names, Eigen values and variance of factors**

| *Factor Names* | *Eigen values* | *Variance of factors* |
|---|---|---|
| Environmental awareness | 5.351 | 13.758 |
| Attitudes towards recovery | 4.996 | 11.211 |
| Attitudes towards recycling | 2.095 | 7.578 |
| Environmental consciousness and behavior | 1.434 | 7.097 |

The first factor consisted of fifteen items related to planting works, environmental cleaning, the importance of species, protection of forests and national parks, cultural environment and environment economy. Therefore, the first factor including general attitude items towards the environment was called the "*Environmental awareness*".

The second factor included eight items such as using rechargeable batteries, recycling old clothes and newspapers, unconscious consumption, and saving as much as possible. These items include principles of recovery; hence this factor was called as "*Attitudes towards recovery*". The item "I wonder how the natural events occur" was loaded onto both first and second factors but it was included in the first factor since its factor loading was greater the first factor than it was in the second factor.

The third factor consisted of five items such as teaching people recycling, separating waste materials in house for recycling, and participating in and performing recycling activities. Since these items can be specified as attitudes towards recycling, the third factor was called as "*Attitudes towards recycling*".

Seven items such as working voluntarily for a better environment, saving for not exhausting the resources, participating in environmental projects and worrying about environmental matters have been gathered under the fourth factor. Since the items can be specified as behavior towards the environment, the fourth factor was called as "*Environmental consciousness and behavior*."

### Validity and Reliability of the EAS

Validity is about measuring the concept, desired to measure, without confusing it with other concepts. Although there are various kinds of validity, arranging the instrument according to the statistical data is related to "construct validity". The construct validity of the instrument indicates how accurate it measures an abstract concept (factor) in terms of the behavior to be measured (Tavsancil 2002). The construct validity of the EAS was examined using factor analysis with varimax rotation. In the development process of the EAS," the expert opinions provided data about content and face validity, and students' evaluations provided data about construct validity.

Reliability is about how consistent the items are with each other, in a scale or questionnaire and it shows to what extent instrument reflects the data about the concept. For examining the reliability of an instrument, methods such as test- retest, parallel forms and internal consistency are used. In our study, for determining whether items of the EAS are consistent with each other or not, frequently used Cronbach alpha internal consistency coefficient was calculated. For this purpose, series of reliability analyses were performed for each factor. Table 3 summarizes factor names, number of items and reliability value of each factor. Liu (2003) argues that the limit value for reliability of an instrument can be taken as 0.70. It is stated that for pilot testing Alpha can be taken as 0.60, in basic research it should be 0.80, and for applied research the value of Alpha should be around 0.90-0.95. Cronbach Alpha coefficient of the EAS was found as 0.83. In accordance with related literature, the EAS can be regarded as a reliable and valid instrument to measure students' environmental attitude.

**Table 3: Internal consistency values for the factors of the Environmental Attitudes Scale**

| *Factors* | *Cronbach Alpha* |
|---|---|
| Environmental awareness | 0.84 |
| Attitudes towards recovery | 0.78 |
| Attitudes towards recycling | 0.70 |
| Environmental consciousness and behavior | 0.70 |
| The whole instrument | 0.83 |

## DISCUSSION

This study reports the development and validation procedure for the EAS designed to measure high school students' attitudes toward environment. The instrument consisted of four scales and 35 items with responses recorded on a four-point Likert scale, options ranging from strongly agree to strongly disagree (4-Strongly agree, 1-Strongly disagree). The maximum score that can be obtained from the instrument is 140 and the minimum score is 35. The EAS was subjected to: (1) factor analysis for exploring factor structures and (2) a series of reliability analyses for investigating reliability of each factor emerged. The final form of the EAS consists of 35 items to measure four dimensions of environmental attitude.

It is essential that individuals, who somehow cause environmental problems, should be aware of their responsibility in solving these problems. To remind the individuals of their responsibilities about environment, it is necessary to practice a successful environmental training at all stages of education. Based on the findings of international studies on environmental training,

it is seen that the best educational stage to provide environmental training efficiently is high school (Unal and Dimiski 1999). To raise environmentally conscious individuals, first, it is essential to determine what students know about environment and their attitude towards the environment and then to work on improving their attitude towards and knowledge about their environment (Unal and Dimiski 1999). It can be argued that the more positive attitude an individual has towards the environment, the less environmental problems occur. Therefore, the attitudes of high school students towards the environment should be measured and educational practices should be employed to direct students to have more positive attitudes towards their environment. In this context, instruments developed to measure students' attitude towards the environment have a vital role in the process of developing positive environmental attitudes, in terms of both time and cost (Ugulu et al. 2008).

Researches on elementary and high school students' environmental attitudes (Yilmaz et al. 2004; Jenkins and Pell 2006; Aslan et al. 2008; Ugulu and Erkol 2013) indicate gender difference in students' attitudes toward environment. The results of this study showed that the female students give higher scores than male students on the Environmental Attitude Scale. These results coincide with the results obtained by Zelezny (2000) in his study carried out across ages and countries and they also coincide with the results shown by Ugulu (2011) in the copy they have made of the application of the environmental attitude scale with Turkish high school students. One interpretation of this phenomenon is based on the fact that in social aspects and collective actions women tend to display a higher level of commitment and responsibility than men (Fernández-Manzanal et al. 2007).

Consequently, to provide a healthy and reliable environment for future generations, it has become necessary to raise environmentally conscious individuals (Yorek et al. 2010). Based on the studies in this field, it was concluded that environmental training, at all stages of education, was not as effective as it was desired and was inadequate for developing terminal behaviours towards environment (Webb and Boltt 1990; Yucel and Morgil 1998; Ugulu 2011). The studies on behaviors and attitudes towards environment are becoming increasingly important. Therefore, the present study will be useful for researchers to determine the effects of environmental education programs and to point the areas for development.

## CONCLUSION

Constructing an attitude instrument which should be used in determining the attitudes of high school students toward environment is aimed by this study. To develop a qualified instrument, all the steps of constructing a Likert-type attitude scale were followed. The draft scale was composed of 63 attitudinal items. Nineteen of the items were excluded in case of item-total correlations whereas nine items were excluded from the scale in case of principle components factor analysis. Additional to the values obtained by Kaiser-Meyer-Olkin and Barlett tests which showed that 35-item scale had construct validity, the internal consistency reliabilities which were estimated both for the whole scale and for subscales dealing with (1) issues related to environmental awareness such as environmental cleaning, cultural environment and environment economy, (2) issues related to recovery such as unconscious consumption and saving as much as possible, (3) issues related to recycling such as teaching people recycling, separating waste materials for recycling, and participating in and performing recycling activities, and (4) issues related to environmental consciousness and behavior such as working voluntarily for a better environment, participating in environmental projects and worrying about environmental matters. Finally, research findings show that the scale is valid and reliable.

## RECOMMENDATIONS

The EAS will provide researchers with an instrument of environmental attitude for high school students in four dimensions, containing important aspects of environmental issues for a better understanding. Further validation studies for the scale may be conducted with different school students. It is believed that further validations would provide very fruitful information whether the scale can be used with younger students. The researchers suggest that usefulness of this scale is not restricted only to high school students, but also responses of younger

or older students can result in meaningful factor dimensions.

It is believed that the EAS is a promising tool for both instruction and research in environmental education to explore students' attitudes towards environment. Instructors can use the instrument to measure attitudes of their students and more specific views of students' attitudes in four dimensions. In addition, the scale will be a useful instrument for quasi-experimental studies requiring pre- and post administration. Instructors can use the instrument particularly for observing the effect of an environmental training they provide or an instructional intervention they examine.

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