



**ORIGINAL ARTICLE**

## **Students' Understanding of Environmental Components and its Relationship with the Awareness of their Parents (A case study on secondary school students in Esfahan, Iran)**

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### **ABSTRACT**

Since in many cases, knowledge and attitude of people affect their behavior, it's necessary to investigate the attitude and the knowledge of people in the society towards environmental issues. In a word, when the level of awareness and the attitude of people to the environment are known, it's possible to affect their behavior and functionality. To achieve this knowledge and to determine the level of sensitivity to environmental issues and to investigate the possibility of increasing the role of people in contributing to environmental planning, the present research which is descriptive- analytic and correlation in design, was conducted. The population of the present study consisted of students of secondary school in 5 districts of the city Esfahan. The data was gathered by a questionnaire with a sample size of 381 through Cochran formula using classified sampling method. In this population, along with the investigation of the level awareness of the students, the effects of other factors such as, their gender and the level of education of their parents were investigated. The result showed that the students have appropriate level of environmental information and this information in recognition of relations between the components of the environment is more than other parts of the questionnaire. Moreover, this information is influenced by the educational level of their parents (both fathers and mothers) and also, there is a significant relationship between students' recognition and their parents' knowledge.

Keywords: Environment Component, Awareness

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### **INTRODUCTION**

In today's world, environmental crises that human beings face such as global warming, the destruction of natural habitats, the decrease of natural sources, the increase of different sorts of pollution, the growth of population and some other cases which influence human life are not deniable [43]. Regardless of their kind, these crises are limitless and worldwide and generally the existence of one causes the augmentation or existence of the other [46]. It's known to everyone that environmental problems have negative consequence for human health in first step and in the next steps affects economical, social and cultural growth and development. Therefore, worries about environmental threats are increasing day by day. Actually, human activity and environmental changes are directly related, many human activities have negative consequences especially for human health and most importantly for children [46, 49]. Therefore, all countries and nationalities should try to eradicate or at least decrease these consequences and reduce their destructivity [46, 48]. In other words, human being is doomed to accept the consequences of his negligence to nature and should try to reduce them. Considering the fact that the destruction of environment endangers the life of humans as well as all other living creature, many efforts have been taken nationally and internationally to solve this problem [2]. However, many people, groups and governments in different social levels are still continuing their environmentally- distractive behavior in spite of being aware of the consequences of these crises [21].

Since these problems are just made by humans, the most effective solution for removing them is teaching in national levels and enhancing public culture and awareness as well as setting proper laws [2]. In other words, we need to make environmental awareness a part of society knowledge. In this way environmental problems become public worries. The aim of environmental instruction is training a citizen who, both theoretically and practically, has supportive behavior toward the environment and avoids the destruction of it [3, 8, 1]. It seems enhancing knowledge and information in this field leads to a change in people's attitude, a change in individuals' functionality and behavior and finally a change in environmental policies [5].

Since in many cases the knowledge and attitude of people influences their behavior, it seems necessary to investigate the attitude and public awareness of individuals in the society towards environmental issues [18]. Knowing the level of awareness of people and their attitude to environment gives us the chance to influence their behavior [10], to achieve this knowledge and to determine the level of sensitivity of people to environmental issues and the possibility of increasing the role of people in contributing to environmental planning, the best and most appropriate way is using questionnaire [46]. This instrument is used widely and in varying forms by many researchers [18, 19, 46, 5, 15, 16, 17, 26, 33, 34, 38, 43, 32] all around the world.

Here, the awareness and attitude of young generations has considerable importance; because they are those suffering from the consequences of environment destruction caused by us and they should find a proper solution for this problem [11]. As future leaders of society and as supporters of the health of the environment as the only source which can satisfy human needs, it is necessary for all children and teenagers to know about the environment and how human activities lead to its destruction and the decrease of its quality. Children and teenagers should learn about their responsibilities to the environment that they can decrease or eradicate the problems [33]. In other words, restoration of natural resources and environment should start with basic instruction of children to cause public contributing in this field. This is the most serious and most effective way of battling against the destruction of nature [24].

Today environmental issues are of considerable importance in our country and environmental instruction can have a great effect on enriching environmental culture and achieving the goal of sustainable development [24]. Therefore, investigation of the level of awareness of the youth and their attitude is of considerable importance because of two reasons: first in order to improve their behavior and second to get a basic level to start the instruction from. Studies of this sort which use questionnaire as an instrument to investigate children's and teachers' attitude to environment have been numerous conducted [2, 3, 11, 13, 20, 23, 24, 27, 28, 49, 44, 45, 47, 1, 6, 35].

In this research a questionnaire was distributed among students of secondary school in Esfahan to learn about the level of their information and to investigate the effect of factors such as age, sex, the educational level and age of their parents. Moreover, the relationship between students' information and the information of their teachers and parents was investigated. The aim of the research is to find out about the following questions:

- How much information about environment do students of secondary school in Esfahan, their parents and their teachers have?
- Do factors such as the sex of the students and the level of parents' education have any effects on the level of the awareness and information of the students toward the environment?
- Is there a correlation between the environmental awareness of students with the environmental awareness of their parents?

## **MATERIALS AND METHODS**

### ***Study area***

The location under the present study is the city Esfahan which is a historical- touristy city in the center of Iranian plateau with the characteristics of northern 32 degrees and 39 minutes and eastern 51 degrees and 40 minutes.

### ***Method***

The method used in the present study is descriptive- analytic and the data was gathered by a questionnaire having 19 items in Likert scale [39]. The questionnaire consists of four parts: 1- Live components 2- non-living components 3- relationship between components 4- identifying ecosystems (table-1). The questionnaire was prepared for two groups of students and parents in two different wordings.

The population of this study consist of all secondary school students, both boys and girls, in five academic districts of city Esfahan consisting of 30084 boy students and 31250 girl students. Through using Cochran formula and considering the population, sample size was estimated 381. In the present research, finally

390 students (186 girls and 204 boys) were chosen through classified sampling [45]. Also 570 parents (235 mothers and 235 fathers) were tested to investigate the level of their awareness with the students' level of awareness. To make sure of the validity of the questionnaire, after preparation of the final form, it was given to some expert in the field and some ordinary individuals and the mean of their ideas were applied in the questionnaire to make it acceptable in terms of its validity. The reliability of the questionnaire was measured 0.91 through a pilot test on 30 students using Cronbach's alpha.

Table-1: Tree diagram of identifying environmental components questions

Goal	Index	Criterion
Recognition of environmental components	Live components	Plants, Animals
	Non-living components	Water, Soil, Air
	relationship between components	Recognition relationships
	identifying ecosystems	Forests, Deserts, Wetlands, Grasslands, Mountains, City

### Analysis of data

To analysis the data of present research, Mann-withney, Kruskal- wallis, Dunn, correlation and regression were used.

## RESULTS

### Investigation of students' knowledge from various parts of the environment

In order to understand the amount of participants' knowledge towards the environment components, the average of answers for each part was calculated. In figure (2) the mean of the answers of different groups to 19 items of the questionnaire is shown. The results show the level of the awareness of groups to environment is appropriate (Ranking average is over 3.4 according the Likert).

Table 2: the mean of the ranking of the awareness of the groups under study to environment

Goal	Index	Criterion	Answers Ranking Average*				Total Average	
			Students		parents			
			Girls	Boys	Mothers	Fathers		
Recognition of environmental components	Live components Questions 1-5	Plants Questions 1,2,3	4.47	4.51	4.62	4.50	4.52	
			3.57	3.58	4	4.02	3.83	
			3.48	3.75	3.69	3.72	3.66	
		Plants Recognition Ranking Average		3.84	3.95	4.10	4.15	4.01
		Animals Questions 4,5	3.06	3.06	3.10	3.04	3.06	
			3.81	4.29	3.92	3.96	3.99	
	Animals Recognition Ranking Average		3.44	3.68	3.51	3.50	3.53	
	Live components Recognition Ranking Average		3.68	3.84	3.86	3.86	3.81	
			3.76		3.86		3.81	
	Non-living components Questions 6-10	Water Questions 6,7	3.73	3.71	4.07	4.02	3.88	
			2.10	2.80	2.65	2.71	2.56	
		Water Recognition Ranking Average		2.92	3.25	3.36	3.37	3.22
		Soil Questions 8,9	4.12	4.11	4	4.05	4.07	
			4.33	4.34	4.08	4.11	4.21	
		Soil Recognition Ranking Average		4.23	4.34	4.04	4.08	4.14
	Air		4.26	4.30	4.14	4.22	4.23	
	Non- living components Recognition Ranking Average		3.69	3.85	3.79	3.82	3.78	
			3.77		3.80		3.78	
	Relationship between components Questions 11,12	Relationship Recognition	4.36	4.40	4.40	4.36	4.35	
			3.73	4.07	4.06	4.08	3.98	
	Relationship Recognition Ranking Average		4.04	4.24	4.23	4.22	4.18	
	Identifying ecosystems Questions 13-19	Forests Questions 14, 15	4.31	4.35	3.99	3.90	4.13	
			3.79	3.98	4.09	4.14	4	
		Forests Recognition Ranking Average		4.05	4.16	4.04	4.02	4.06
		Deserts Question 15		4.27	4.40	4.20	4.18	4.26
		Wetlands Question 16		3.34	3.39	3.45	3.49	3.41
		Grasslands Question 17		3.28	3.33	3.84	3.80	3.56
Mountains Question 18		3.66	3.89	3.85	3.77	3.79		
cities Question 19		3.97	3.89	3.85	3.85	3.89		
Identifying ecosystems Recognition Ranking Average		3.80	3.89	3.97	3.89	3.88		
		3.85		3.93		3.88		
Total Ranking Average for recognition of environmental components**			3.77	3.90	3.89	3.89	3.86	

\*1-1.8 very little, 1.8- 2.6 little, 2.6-3.4 average, 3.4-4.2 much, 4.2-5 very much

\*\* This number is the average of the answers of groups to 18240 Items.

Kruskal- wallis test has been used to understand whether there is any difference between students' knowledge toward different parts of questionnaire. The results indicate that there is a significant difference between students' knowledge toward different parts (table 3), and this knowledge is higher in recognition of relationship between environmental components (figure 1).

Table 3:the results of Kruskal- wallis test, the investigation of the difference between the students' answers to different parts of questionnaire, df=3

Groups	Mean of Rank	X <sup>2</sup>	p- value
Live components	685.32	117.538	0.000**
Non-living components	699.81		
relationship between components	990.20		
identifying ecosystems	746.67		

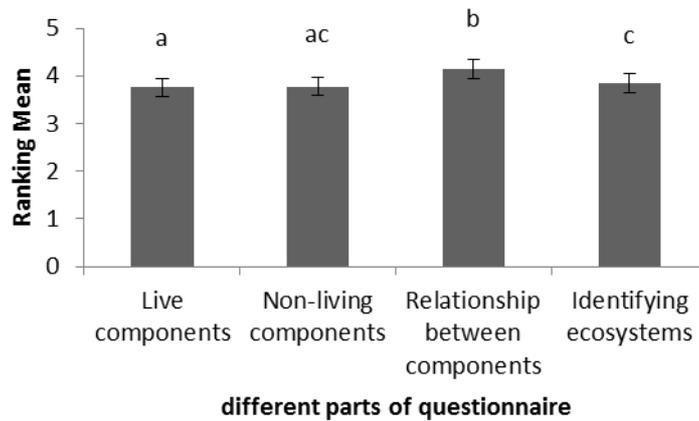


Figure 1: Difference between students' answers to different parts of questionnaire

**Investigation of students' knowledge according to their gender**

The results show the level of the awareness of groups to environment (the means of students' answers to 19 items) is appropriate. Moreover by analyzing the answers of the groups, it was found out that totally 87.7% of girls, and 91.2% of boys answered over 3.4 which indicates that the level of their environmental awareness is higher than average (table-4). There is a significant difference between the awareness levels of these two groups in 1 percent level (P< 0.01). Also it was found out that boys are more knowledgeable of girls in this regard (figure- 2).

Table 4: the results of Mann-withney test, the investigation of the difference between the awareness of girl and boy students

Group	Numbers	Ranking Mean*	Mean rank	P- Value
Girls	186	3.77	173.59	0.000**
Boys	204	3.90	215.47	

\*1-1.8 very little, 1.8- 2.6 little, 2.6-3.4 average, 3.4-4.2 much, 4.2-5 very much

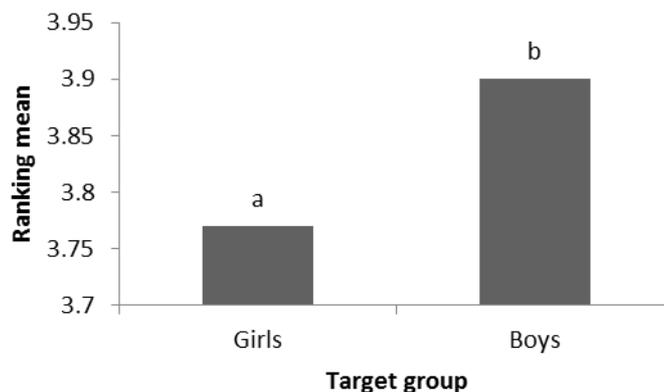


Figure 2: the comparison between environmental awareness of girl and boy students

**3-3 Investigation of students' knowledge according to the educational level of their parents**

To investigate the effects of parents' educational level on students' awareness Kruskal- wallis test was used. To this end, four educational groups of 1- under diploma 2- diploma and associated degree 3- bachelor degree and 4- the post graduated degree were formed. The results of the test indicate that students are affected by the educational level of their parents considering environmental awareness ( $P < 0.01$ ) (table- 5, 6). The results of Dunn test for fathers' education is in figure (3) and for mothers' education in figure (4).

Table 5: The results of Kruskal- wallis, the investigation of the difference between students' answers to 19 questions based on the level of their fathers' education,  $df=3$

Group	Ranking Mean*	Mean rank	number	X <sup>2</sup>	P- Value
Under diploma	3.76	161.78	143	20.456	0.000**
Diploma and associated degree	3.88	196.22	166		
Bachelor degree	4.02	239.57	49		
Master degree	3.77	164.71	19		

\*1-1.8 very little, 1.8- 2.6 little, 2.6-3.4 average, 3.4-4.2 much, 4.2-5 very much

Table 6: The results of Kruskal- wallis, the investigation of the difference between students' answers to 19 questions based on the level of their mothers' education,  $df=3$

Group	Ranking Mean*	Mean rank	number	X <sup>2</sup>	P- Value
Under diploma	3.79	166.76	136	15.361	0.002**
Diploma and associated degree	3.85	183.97	176		
Bachelor degree	3.96	214.02	41		
Master degree	3.91	207.61	9		

\*1-1.8 very little, 1.8- 2.6 little, 2.6-3.4 average, 3.4-4.2 much, 4.2-5 very much

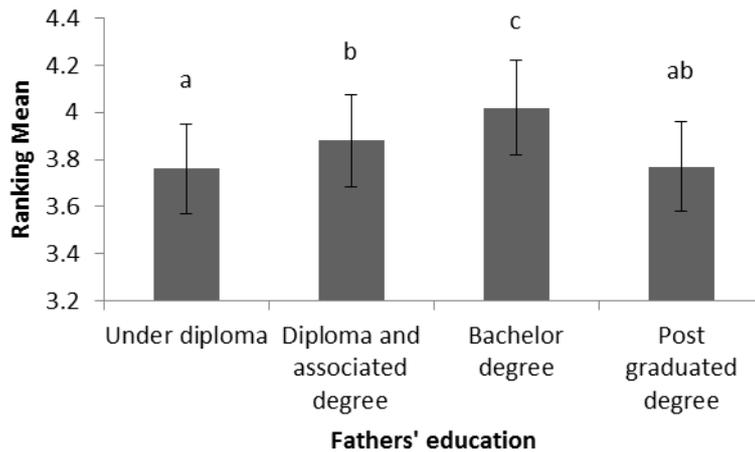


Figure 3: The investigation of the difference between the awareness of students based on the educational level of their fathers

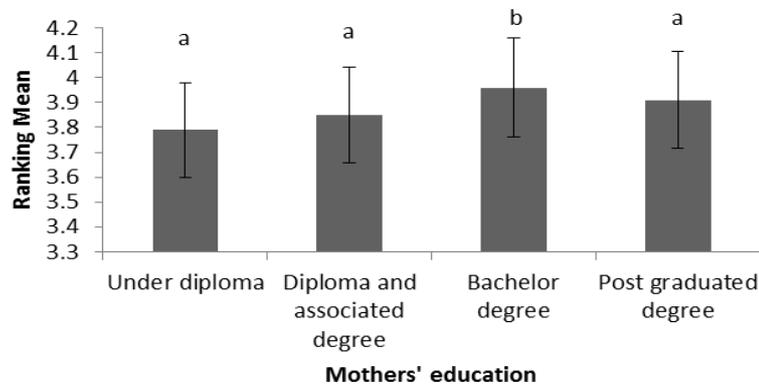


Figure 4: The investigation of the difference between the awareness of students based on the educational level of their mothers

Figure 3 illustrates as the educational level of fathers increase to bachelor degrees, the awareness of students' toward environment increase as well, however there is no meaningful difference between the answers of students whose fathers have high educational degrees and the others ( $P > 0.05$ ).

Figure (4) depicts environmental awareness of students whose mothers have bachelor degree is higher than other groups and there is no meaningful difference between the answers of the students whose mothers have post- graduate degrees and the rest of the students ( $P > 0.05$ ).

#### **Investigation of the relationship between the level of students' awareness and their parents' awareness**

In order to investigate the difference between the answers of 235 parents with 390 students, Mann-Withney test was taken use of. The results of the test are in table-7, there is a meaningful difference between students' and parents' awareness in 5 percent level. According to ranking mean this awareness is higher in parents.

Table 7: the results of Mann-withney test, the investigation of the difference between the awareness of students and parents

Groups	Number	Ranking Mean*	Mean of Ranks	P- Value
Parents	235	3.89	332.17	0.039*
Students	390	3.83	301.45	

\*1-1.8 very little, 1.8- 2.6 little, 2.6-3.4 average, 3.4-4.2 much, 4.2-5 very much

To investigate the relationship between the level of parents' awareness and students' awareness and to find out if students' awareness is influenced by their parents, a correlation test was used for 235 students' and their own parents (the means of father's and mother's answers was calculated and stated under the name parents). The results show there is a 22% positive correlation between students' answers and their parents' answers (tables-8).

Table 8: The results of spearman correlation tests, investigation of the relationship between students' and parents' awareness

Group	number	P- Value	Correlation coefficient
Students and their parents	235	0.000**	0.22

## **DISCUSSION AND CONCLUSION**

The results obtained by comparing the means of the answers show the level of environmental awareness of students and parents in all the five districts of the city Esfahan is rather high (table -2). Zsuzsanna, *et al*, [49] conducted a research on the awareness of Hungary children about their environmental and concluded that about 70 percent of children have good environmental information. However the level of students' awareness was low in a research by Alp, *et al*. [3] but these students had a positive attitude to environment. In a study by Bonnett and Williams [9] on the students in cities and village it was found out that all the students are aware of environmental problems and are worried about the environment.

In this study awareness of students in four parts -Live components, non-living components, relationship between components, and identifying ecosystems- were investigated. Although the general level of students' understanding about the environmental components is good, the amount of knowledge about the relationships between environmental components is significantly higher in comparison with other parts. Perhaps the high level of training in the field of communication among the environmental components specially the food chain in school books, and rich television programs for children can be introduced as causes of this high cognition in children.

The results showed boys have higher environmental awareness in different district of the city than girls. In a study on the investigation of the factors contributing to children's environmental awareness, Nasr *et al*, (2011) reported boys' higher environmental awareness compared to girls. Also, Astalin [6] in a study of environmental awareness among high school students in India has found out a similar conclusion. In a similar study by Alp *et al*, [3] under the title "A survey on Turkish elementary school students' environmental friendly behaviors and associated variable" the effect of sex on students' attitude was proved. On the other hand, in similar research, Carrier [12] and Tikka *et al*, [44] reported that the attitude of girls is more positive than boys. However, in another study by Alp *et al*, [2], sex was proved to have no role. Yildiz *et al*, [46] mentioned that sex is not an important factor in environmental awareness. In a study on the importance on biodiversity, Lindman *et al*, (2007) state that for women biodiversity is more important than men. Still, in another study with Junge [25], the same researcher concludes sex doesn't have any effects on the tendency to biodiversity. Again the same researcher in another study on familiarity with the word "biodiversity" (2008) states there is no difference between girls and boys in their familiarity with this word. The level of concern the students have toward environment and the responsibility they feel for it showed no relationship with sex in a study by Yilmaz [47]. As it can be seen from the findings of these research studies, there is no pattern for considering a difference between

environmental awareness of boys and girls in the present research can be justified by the fact that boys generally benefit from a higher level of confidence and are better at fitting their information in the questions they are asked. The cultural difference between boys and girls in the society cannot be ignored too; as boys have more freedom to go out and face different natural phenomena which leads to their higher environmental information. This difference cannot be found in other countries.

The results indicate that students' environmental awareness is influenced by their fathers' level of education. When the level of education of fathers increases, especially up to bachelor degree, the level of awareness of the students also increases. The same results can be seen in a study by Bagheri [7] on the awareness and attitude of students of high school in Tehran. Alp et al, [3] also found out the awareness of students is influenced by their fathers' educational level.

According to the results of this research, the level of students' awareness is also influenced by the level of their mothers' education. Here again by increasing the level of education, especially up to bachelor degree, an increase in awareness level occurred. Bagheri [7] reports a relationship between the levels of awareness of high school students in Tehran with the education level of their mother. Parents who have higher education have higher levels of information to transfer; as in research studies by Yildiz et al, [14], [36] it has been approved that as educational level of individuals increase their awareness to environmental issues also increase. To justify the lack of significant difference among the students whose parents have post- graduate degrees, it can be said that higher education probably leads to more activities, and therefore such parents don't spend enough time for their children. Similar to the findings of this research, Haidarmakki et al, [21] reports a relationship between parents' education and attitude of students toward environment. However, in a study by [1], parents' education is reported non- effective in children's attitude.

The results illustrate that there is a significant difference between students' and parents' knowledge about environmental components and this knowledge is higher in parents. Parents are more experienced, older, and in many cases have higher education level, so it is not unjustified if they are more knowledgeable about environmental component. Correlation test for the relationship between students' awareness and parents' awareness showed only 22% of students' awareness depends on their parents' awareness. Iranian children spend most of their time at home and with their parents; they learn most of the things from their parents and are under direct influence of them. Therefore, it can be concluded that family can be a good start for increasing the awareness of children to environment. Haidarmakki et al, [21] also found a relationship between students' attitude to environment and parents' role.

As it was mentioned, instruction about environment is of vital importance. So these instructions should be on top of educational plans. According to the results of studies by Keiser et al, ) and Kuhlemeier et al, [28], there is a significant difference between environmental awareness and behavior of the individuals. Moreover, considering the study by Frick et al, [18] which states only practical information lead to proper behavior in the field of environment, it's suggested that student's practical information be increased through special tours of nature exploration as well as their theoretical information.

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