British Journal of Education, Society & Behavioural Science
6(1): 61-70, 2015, Article no.BJESBS.2015.043
ISSN: 2278-0998

SCIENCEDOMAIN *international*
www.sciencedomain.org

Effect of Level and Diversity of Education on Environmental Awareness

K. Shivakumara[1*], Sangeetha R. Mane[2] and Ashok A. Pal[1]

[1]Department of Psychology, Karnatak University, Dharwad – 03, Karnataka, India.
[2]Department of Social Work, Karnatak University, Dharwad – 03, Karnataka, India.

Authors' contributions

This work was carried out in collaboration between above all authors. Author KS designed the study and wrote the research article. Author SRM carried out statistical analyses and assisted in writing the research article. Author AAP read the drafts and suggested suitable corrections and finalized the manuscript.

Article Information

DOI:10.9734/BJESBS/2015/14545
Editor(s):
(1) Satu Uusiautti, University of Lapland, Rovaniemi, Finland.
Reviewers:
(1) Ikehi Michael Ejime, Vocational Teacher Education, University of Nigeria, Nsukka, Nigeria.
(2) Anonymous, Chengdu University of Technology, China.
(3) Anonymous, Necmettin Erbakan University, Turkey.
Complete Peer review History: http://www.sciencedomain.org/review-history.php?iid=818&id=21&aid=7414

Original Research Article

Received 5th October 2014
Accepted 18th November 2014
Published 17th December 2014

ABSTRACT

Aims: The present research studied the effects of level and diversity of education on environmental awareness of the individuals.
Study Design: Present study adapted a survey research design.
Place and Duration of Study: The research was conducted in Karnatak, Bangalore Universities, and Dharwad Taluk of Karnataka State, duration of study between February 2011 and July 2012.
Methodology: Participants in the study were less educated and highly educated individuals. The less educated individuals involved in agriculture and daily labour activities having an educational qualification of primary to pre-university education. Whereas highly educated individuals were University students studying in 3rd semester of their science and social science courses. The research instrument used for assessing environmental awareness was environmental awareness test developed by Jha (1998). ANOVA and 't' analyses were adapted to find significant difference between the groups.
Sample: We included 721 respondents comprising of 605 post-graduate science and social-science students (Karnatak and Bangalore Universities of Karnataka State) and 116 less educated

**Corresponding author: E-mail: kumarpsy123@rediffmail.com;*

individuals (of Dharwad Taluk of Karnataka State), age ranging between 22 to 24 years.
Results: It was found that the highly educated individuals have higher environmental awareness than the less educated individuals. However, the study did not find support for the assumption that diversity in education in terms of science, social science and environmental science has differential effect on environmental awareness of the students.
Conclusion: Conclusion may be drawn from the results that the higher education one obtains plays significant role in increasing environmental awareness and the diversity in education has no differential effect on the awareness. Even when environmental related courses are not offered in the syllabus the higher education is beneficial for acquiring higher environmental awareness.

Keywords: Level of education; science; social-science and environmental science education environmental awareness.

1. INTRODUCTION

The 20th century is said to have been an extraordinary eventful century. The world during this period has seen spectacular political, social, cultural, economic, scientific and technological progress. One of the challenges of this period has been the growing need to find ways of improving the prosperity and well-being of people without compromising the environment. This challenge is also very serious in South Asian region; it is even more than in other parts of the world. The Asian region is today faced with serious environmental problems. Industrial growth in the region has taken place at the cost of environment and the challenges to sustainable development are staggering in number, scale and complexity [1].

Sustainable development (SD) is a process of changes in which the exploitation of resources, direction of investment, orientation of technical development and institutional change are made consistent with future as well as present social and economic needs. The goal of an effective strategy for sustainable development would need to have several components – political will, access to technology, finances, education and research process and experimentation. Education is one of these many tools and has been recognized as an indispensable part of SD strategies [1].

Education has become an essential strategy for government, and many local and international non-government groups and organizations in protecting the environment [2]. The major objectives set out in the Tbilisi Intergovernmental Conference on Environmental Education includes awareness, sensitivity, attitudes, skills, participation to be developed in achieving the environmentally literate and responsible citizen [3]. It was in the nineties that the United Nations Conference of Environment and Development took place in Rio de Janeiro, the so called Rio-92, focused on global environmental problems and on issues related to the central idea of sustainable development. As a consequence of the Rio-92, a set of proposals of actions for the subsequent years were expressed in the agenda 21. Chapter 36 of Agenda 21 which states that: "Education including formal education, public awareness and training should be recognized as process by which human beings and societies can reach their fullest potential" [4]. Education is critical for promoting sustainable development and improving the capacity of people to address environment and development issues [5].

According to Maloney, Wand and Braught [6] it is very important to assess the awareness and knowledge of individuals on the environment, ecology or pollution during and after periods of education. The environmental concept that the individual attains is the most important factor that explains their attitude towards environment and environmental protection [7-8]. Education is one of the important factors to achieve cultural awareness on environmental protection. Environmental knowledge results in increase of accountability and inner motivation. A review of literature indicated that art education like other school curriculum could contribute to the development of attitudes, values and behaviours toward the natural environment [9]. In essence, 'in-depth' knowledge of environmental problems and the intention to act are all variables associated with responsible environmental behavior. Hence, environmental educators hope that education can help acquire a strong environmental awareness so that their environmental attitudes and ultimately behavior will be environmentally mindful [10]. New House [11] adds that knowledge or awareness of such environmental problem is clearly a requisite for an appropriate course of action.

1.1 Science Education

Science education has significant relevance with the problem and issues related to the environment. Science underlies the process of understanding nature and natural phenomena, there exists great opportunities for incorporating and dealing environmental concepts through science, where learning-by-doing, outdoor teaching, experimental learning, data analysis etc. are very closely associated with the science and environmental education. They help students to develop skills of observation, enquiry, analyzing, experimenting which in turn provides practical awareness, knowledge and favourable attitude towards the environment [1]. Makki et al., [12] opined that among the various subjects taught in elementary school, science is emphasized as the most significant contributor to acquiring the knowledge on environmental issues. In line with this elementary education curriculum developers tend to teach environmental education through science.

In the last two decades, the literature in science teaching has pointed out that science teacher beliefs can be strongly influential to students' thinking [13]. Teachers are highly influential and co-responsible for constructing the sustainable development in the social future [14].

1.2 Environmental Education

Environmental education (EE) is recognized as the process that would help individuals to acquire essential knowledge and skills to take positive action towards a better environment. Thus 'action' distinguishes environmental education from the conventional concept of education. Environmental education takes place in many different forms: In-class programs, outdoor classrooms on school grounds, day-field trip to nature centers and natural areas and residential programs of two or more days [15]. Hence, EE is the education that seeks to develop a population that has the knowledge, skills, values and motivation to solve environmental problems and work for sustainable development.

Environmental awareness is a fundamental understanding of the natural world. This is essential for developing future sustainable development. Madsen [16] concludes that knowledge, beliefs and commitment are necessary components when addressing environmental concerns. It is likely that environmental education specialist demonstrated higher levels of experience with a commitment to environmental issues resulting in higher levels of awareness, knowledge and attitude. These results suggest positive implications in terms of curriculum implementation, knowledge and attitude directly related to the process of teaching [17]. Research has consistently found positive value changes in students at the inclusion of the environmental courses in their curriculum [18-19].

Traditional education has role of transforming existing knowledge of society to individuals and also promote young people's competencies for critically analyzing and reflecting the environmental awareness. Various researchers have tried to measure the effectiveness of in-classroom environmental education taking place [20-26]. It is realized that education is the only one of the factors contributing to learning [27], which motivates people's knowledge concerning the environmental issues.

The role of education in understanding, protecting and solving environmental problems has been universally recognized since 1970 [28]. From 2000, researchers have considered the use of environmental education in schools, colleges and universities [10,29-30]. Researchers subsequently examined students' knowledge and attitudes towards the environments [7,31-32] and methods for teaching environmental awareness [18,33-36]. The environmental awareness and knowledge of the students improved as a result of the computer-assisted education within the study [37].

It was found that educated people are more concerned about the environment than the less educated [38]. Diamontopoulos et al., [39] conclude that there is a positive correlation between education and all the components of the environmental domain (knowledge, attitude and behavior).

2. METHODOLOGY

2.1 Objectives

To study the effect of level and diversity of education on environmental awareness of the individuals.

2.2 Hypotheses

1. Highly educated individuals have significantly higher level of environmental awareness than less educated individuals.

2. Among the highly educated, respondents of science course have significantly higher level of environmental awareness than respondents of social-science course.
3. Among the science students, respondents of environmental science course have significantly higher level of environmental awareness than respondents of pure science course.

2.3 Study Area

The study area included rural taluk of Dharwad, and Dharwad and Bangalore cities. Dharwad is class II city of Karnataka State, India, which is located 490 km North West from Bangalore, the capital of Karnataka.

2.4 Study Sample

Sample included 721 individuals, of the total sample 116 were less educated, remaining 316 post-graduate students (Science 144 and Social-Science 172) and 289 (Science 105 and Social-Science 184) were selected from Dharwad and Bangalore respectively. The sample characteristics and the selection of samples are mentioned below.

2.4.1 Less educated individuals

Less educated individuals were selected from rural areas of Dharwad taluk. All of these subjects were educated from their primary to pre-university education. They have been engaged in agriculture and daily labour activities.

2.4.2 Highly educated individuals

Highly educated individuals in the present study comprised of post-graduate students studying in Karnatak and Bangalore universities. The students of science and social science discipline were included from both the universities.

2.4.2.1 Dharwad sample

Dharwad University students studying in the 3rd semester of their post-graduate courses of Economics, History, Political Science, Social Work and Sociology were included for social-science sample group. Similarly, the students of post-graduate courses of Botany, Chemistry, Geography, Geology, Applied Genetics, Physics and Zoology were included for the science sample group.

2.4.2.2 Bangalore sample

The above students were selected from Bangalore University studying in the 3rd semester of their post-graduate courses of Economics, History, Political Science, Social Work and Sociology for social-science sample group and post-graduate courses of Geography, Geology, Environmental Science, Applied Genetics, Physics and Zoology were included for the science sample group.

The students in terms of their departments were matched from the Karnatak and Bangalore Universities. However, in the Bangalore sample groups the students of environmental science course were included.

2.5 Rationale of the Study

The prime rationale of the study is that higher education has significant exposure for the individuals to acquire knowledge and awareness about our natural environment than lower education. Hence the highly educated are expected to have high awareness. The other rationale of the study is that, among the highly educated, the students of science course, especially environmental science course, have wide scope for learning about our natural environment than students of social-science courses; hence the awareness was expected to be more among the former two groups than the later.

2.6 Data

The questionnaire method was used to obtain the information pertaining to the subjects' environmental awareness. Thus the data used for the analysis were obtained from primary source of administering the environmental awareness test. The test was administered in group for the highly educated and individually for the less educated. As the doubts rose, if any, among the respondents, the researcher clarified them. However, care was taken not to educate them about any of the issues since it may affect their responses favourably. The highly educated responded self-marking the choices given for each of the statements.

Besides, care was taken to administer the test to the less educated individuals individually. The test translated into Kannada was administered orally and their responses were recorded carefully by the researcher.

2.7 Tools

Environmental awareness ability measure

The information on environmental awareness of the subjects was collected using the environmental awareness ability measure developed by Jha [40]. This test consists of 51 items including 43 positive and 8 negative items. It measures extent and degree of awareness on dimensions of environment such as causes of pollution, conservation of soil, forest, air, energy, and conservation of human health, wild life and animal husbandry.

The scale has two response options i.e., agree and disagree. Each agreed response was awarded a score of one and each disagree response was awarded a score of zero. But the negative items were scored inversely. Thus, on the total scale possible raw scores ranged from 0 to 51.

Three indices of reliability were determined by the test author. Split-half reliability was found to be 0.61, secondly, it was calculated by Kuder-Richardson Formula method and was found to be 0.84 and thirdly it was determined by test-retest methods, it ranged from 0.74 and 0.71 respectively after three and six months respectively. Thus the environmental awareness ability measure bears an adequate degree of reliability.

To determine validity of the environmental awareness ability measure co-efficient of co-relation between the scores of present scale and environmental awareness scale of Tarniji was computed by the test author. The co-efficient of co-relation was found to be 0.83. The scale has face and content validity.

2.8 Statistical Techniques

After scoring the data, the raw scores were converted to standard scores using the 16.0 version of SPSS, subsequently, the mean and SD was calculated for the groups. Initially, to rule out any significant difference between the less educated and the highly educated individuals of three different regions one-way ANOVA test was carried out. Later, in order to see the difference between various subgroups in terms of level and diversity of education, independent 't' test was carried out.

3. RESULTS AND DISCUSSION

3.1 Education Level and Environmental Awareness

Environmental awareness results in relation to education level have been depicted in Table 1. The mean scores of the highly educated individuals of Dharwad and Bangalore are 51.22 and 51.94 (SD 08.78 and 08.23) respectively, whereas the less educated individuals have a lower mean scores of 39.45 (SD 12.49). To find out the significance level of difference between the three groups one way ANOVA test was carried out. The ANOVA results depicted in Table 2 shows that the obtained F ratio is 83.49, which is significant at 0.01 level of confidence. This implies that there is a significant difference between the less educated and the highly educated individuals of Dharwad and Bangalore domicile on environmental awareness. Further 't' test was computed to ascertain the significant difference between the paired groups of less educated individuals and highly educated individuals.

Table 3 depicts the environmental awareness scores of less educated and highly educated individuals. There was significant difference between the groups (less educated mean 39.45 (SD 12.49)/highly educated mean 51.56 (SD 08.52), $t=12.88$, $p<0.001$). The mean scores clearly imply that the highly educated individuals have higher level of environmental awareness than the less educated individuals. This indicates that the higher education has significant effect in increase of students' environmental awareness. The above results are in accordance with the earlier research findings. For example, the findings of the study by Morrison [41] emphasize the importance of education level on environmental awareness. Literature indicates a positive relationship between education attainment and environmental concern. Consequently, as the level of education increases so does environmental concern [42-44].

Table 1. Means and standard deviations of the sample groups on environmental awareness in relation to their education level

Environmental awareness	Less educated individuals (n=116)	Highly educated Dharwad (n=316)	Highly educated Bangalore (n=289)
Mean	39.45	51.22	51.94
SD	12.49	08.78	08.23

Table 2. One way ANOVA for environmental awareness scores of the sample groups in relation to their education level

Sources of variants	Sum of squares (SS)	Degrees of freedom (df)	Mean Sum of F-ratio squares
Between groups	14367.639	2	7183.820
Within groups	61777.171	718	83.49**
Total	76144.810	720	86.041

*** Significant at 0.01 level*

Morgil et al. [37] used in their study computer-assisted technological applications in order to develop environmental knowledge and awareness. In order to make students obtain environmentally related knowledge, the opportunity to conduct environmental experiments, concepts, pictures, short films, tables, graphics and animations on the internet was given to the students. There was a 20% increase in environmental awareness and 10-12% increase in the environmental knowledge of the students. The computer-assisted education applications provided an increase in the environmental awareness and knowledge. Similar results were determined in the study of Brooks et al., [45]. The positive relationship between education and environmental attitudes demonstrates that educational programs could enhance citizen's environmental awareness and provide them with the information and resources needed to protect their communities environmentally [19].

3.2 Diversity in Education and Environmental Awareness

Earlier studies have emphasized the importance of science education in acquiring the high environmental awareness. In the present study comparative analysis was carried out further to find out the effect of diversity in education in terms of science and social-science education on environmental awareness. The overall results of the Table 4 indicate that the science and the social-science students do not differ significantly on environmental awareness (Dharwad science mean 51.10 (SD 09.31)/Social-science mean 51.31 (SD 08.33), t=0.21, p>0.05 and Bangalore science mean 52.36 (SD 09.45)/Social-science mean 51.71 (SD 07.47), t=0.65, p>0.05). This provides a weak evidence of difference between the science and the social-science students on environmental awareness.

From the above results we infer that when the variable - education is held constant the diversity in education - science and social-science courses do not have significant effect on environmental awareness of the individuals. The overall results provide a weak evidence of the effect of diversity in education on environmental awareness of the individuals.

3.3 Science and Environmental Science Courses

The present study also focused on the effect of environmental education on environmental awareness. The objective was to determine differential effect of environmental science and pure science courses on environmental awareness. Table 5 highlights non-significant results (Pure Science course mean 51.66 (SD 09.98)/Environmental science course mean 56.00 (SD 04.69), t=1.75, p>0.05) pertaining to the assumption that environmental science course has significant effect than the pure science courses. The present study provides lack of support for significant effect of environmental science course on environmental awareness. Hence, it was implied from the study that the integrated and separate course approaches have same effect on enhancing environmental awareness. Findings of an earlier study showed that having courses on the protection of environment and nature within any time of education statistically affect the environmental awareness, attitudes and sensitivity. Of the respondents tested 80% had courses on the environment during their education, their average environmental awareness, attitude and sensitivity, values and levels were higher than the respondents without courses [46].

Table 3. Means, standard deviations and t-value of the less educated individuals and the highly educated individuals on environmental awareness

Environmental awareness	Less educated individuals (n=116)	Highly educated individuals (n=605)	't' value
Mean	39.45	51.56	12.88**
SD	12.49	08.52	

*** Significant at 0.01 level*

Table 4. Means, standard deviations and t-values of the science and the social-science students of Dharwad and Bangalore respectively on environmental awareness

Environmental awareness		Mean	SD	't' value
Dharwad	Science Courses (n=144)	51.10	09.31	0.21
	Social-Science Courses (n=172)	51.31	08.33	
Bangalore	Science Courses (n=105)	52.36	09.45	0.65
	Social-Science Courses (n=184)	51.71	07.47	

Table 5. Means, standard deviations and t-value of the students of environmental science and pure science courses on environmental awareness

	Pure science course (n=88)	Environmental science course (n=17)	't' value
Mean	51.66	56.00	1.75
SD	09.98	04.69	

The finding of present study affirms that when the education level is same, diversity in education has no significant effect on environmental awareness. This may be because the students of higher education get knowledge, other than their education, through print and electronic media. Hence, the present study explores the importance of higher education than science education in acquiring higher environmental awareness. In support of the above findings Celen et al., [47] could not find significant differences between environmental sensitivity scores of the university students that had courses on environment and those did not. Even, Yucel et al., [48] confirmed that having such courses is not indicative for environmental awareness but environmental attitudes and sensitivity of the individuals had courses were prominently higher.

4. CONCLUSION

It emerged from the study that the highly educated have better awareness pertaining to environmental aspects and related problems than the less educated. Also in the present study a striking finding is that diversity in education - science and social-science had no differential effect on environmental awareness of the respondents. It has been supported by the respondents' results of both class II city and metro city.

Environment subjects are offered in science education through integrated and separate course approaches. It was evidenced in the study that on environmental awareness these approaches have no significant diverse effect; the awareness was found to be similar among the respondents of both science and environmental science courses. This implies that when the education is controlled for higher level, the diversity in courses has no significant effect on environmental awareness of the pupil. The inference is drawn from the above findings that when education level increases in the individual, they have wide opportunity to learn more about their environment through other means other than their formal education. Here other sources like reading paper/magazine articles, watching television programs on environmental issues etc may contribute for their higher environmental awareness.

The implication of the study is that education is the best tool for enhancing environmental awareness; it need not be that the education course should be science or even environmental science.

COMPETING INTERESTS

Authors have declared that no competing interests exist.

REFERENCES

1. Shivani J, Meena R. Towards incorporating major environmental concepts into science education in South Asia. Occasional papers series-11. In Greening Science Education; Jerath Nellima & Saxena SK (Eds); UNESCO and PSCST; Chandigarh; 2001.
2. World Commission on Environment and Development. Our Common Future. UK: Oxford University Press; 1987.
3. Tbilisi Intergovernmental Conference on Environmental Education. Towards an action plan: A report on the Tbilisi Conference on Environmental Education (Paper developed by the FICE Subcommittee on Environmental Education). Washington, DC: U S Government Priniting Office; 1978.
4. United Nations. Agenda 21, United Nations Conference on Environment and Development, Rio De Janeiro; 1992.
5. Hoerisch H. A comparative study on environmental awareness and environmentally beneficial behavior in India. CMS ENVIRS Center, New Delhi; 2002.
6. Maloney MP, Ward MP, Braught GN. Psychology in action – A revised scale for the measurement of ecological attitudes and knowledge. American Psychologist. 1975;787-790.
7. Weigel R, Weigel J. Environmental concern, the development of a measure. Environment and Behaviour. 1978;10(1):3-15.
8. Kuhlemeier H, Baergh HLN. Environmental knowledge, attitudes and behavior in Dutch secondary education. The Journal of Environmental Education. 1999;30(2):4-14.
9. Henry. Philosophical inquiry: A practical approach to aesthetics. Art Education. 1993;46(3): 20-24.
10. Palmberg I, Kuru J. Outdoor activities as a base for environmental responsibility. Journal of Environmental Education. 2000;31(4):32-36.
11. Newhouse, N. Implications of attitude and behavior research for environmental conservation. The Journal of Environmental Education. 1990;22(1):26-32.
12. Makki M, Boujaoude S, Abd-El-Khalick F. Lebanese secondary school students' environmental knowledge and attitudes. Environmental Education Research. 2003;9(1):21-34.
13. Anderson RD, Mitchener CP. Research on science teacher education. In Gabel D (Ed). Handbook of Research on Science Teaching and Learning, MacMillan, New York; 1994.
14. Carmen RO Farias, Washington Carvalho. Meanings of development, technology and environment among science educators. Available:www.modelab.ufes.br/xioste/papers/xioste_papers076.pdf.
15. Dettmann-Easler D, Pease JL. Evaluating the effectiveness of residential environmental education programs in fostering positive attitudes towards wildlife. Journal of Environmental Education. 1999;31(1):33-39.
16. Madsen P. What can universities and professional schools do to save the environment? In Callicott JB and Da Rocha FJ (eds.), Earth Summit Ethics: Toward a Reconstructive Postmodern Philosophy of Environmental Education (71-91). Albany State University of New York Press; 1996.
17. Moseley C, Reinke K, Bookout V. The effect of teaching outdoor environmental education on pre-service teachers' attitudes toward self-efficacy and outcome expectancy. The Journal of Environmental Education. 2002;34(1):9-15.
18. Leeming FC, Dwyer WO, Porter BE, Cobern MK. Outcome research in environmental education: A critical review. The Journal of Environmental Education. 1993;24(4):8-21.
19. McMillan EE, Wright T, Beazley K. Impact of university-level environmental studies class on students' values. The Journal of Environmental Education. 2004;35(3):19-28.
20. Jaus H. The effect of environmental education instruction on children's attitudes in elementary school students. Science Education. 1982;66(5):690–692.
21. Kinsey TG, Wheatley JH. The effect of an environmental studies course on the defensibility of environmental attitudes. Journal of Research in Science Teaching. 1984;21(7):675-683.
22. Monroe MP, Kaplan S. When words speak louder than actions: Environmental

problem solving in the classroom. Journal of Environmental Education. 1988;19(3): 38-44.
23. Perdue RR, Warden DS. Environmental education and attitude change. Journal of Environmental Education. 1981;12(3):25-28.
24. Schwaab KE. Instructional methods: Their use and effectiveness in environmental education. Journal of Environmental Education. 1983;14(2):8-12.
25. Simmons DA. More infusion confusion: A look at environmental education curriculum materials. Journal of Environmental Education. 1989;20(4):15-18.
26. Singletary TJ. Case studies of selected high school environmental education classes. Journal of Environmental Education. 1992;23(4):35-40.
27. Jenkins JJ. Four points to remember: A tetrahedral model of memory experiments. In: Levels of processing in human memory. Cermak LS, Craik FIM. (Eds.). Hillsdale N J: Lawrence Erlbaum Associates. 1979;429-449.
28. Shobeiri SM, Omidvar B, Prahallada NN. A comparative study on environmental awareness among secondary school students in Iran and India. International Journal of Environmental Research. 2007;1(1):28-34.
29. Iozzi L. What research says to the educator, Part one: Environmental education and effective domain. Journal of Environmental Education. 1989;20(3):3-9.
30. Shin DS. Environmental education course development for pre-service secondary school science teachers in the Republic of Korea. The Journal of Environmental Education. 2000;31(4):11-18.
31. Ramsey JM, Hungerford HR, Volk T. A technique for analyzing environmental issues. Journal of Environmental Education. 1989;16(3):1-5.
32. Thompson J, Gasteigner E. Environmental attitude surveys of university students: 1971 - 1981. The Journal of Environmental Education. 1985;17(1):13-22.
33. Attarian A. Integrating values clarification into outdoor adventure programs and activities. Journal of Physical Education. 1996;67(8):41-44.
34. Bryant CK, Hungerford HR. An analysis of strategies for teaching environmental concepts and values clarification in kindergarten. (ERIC Document Reproduction Service No. ED 137 117); 1977.
35. Howe R, Disinger J. Teaching environmental education using the out-of school settings and mass media. ERIC/SMEAC Environmental Education Digest, No.1. Washington, DC: Office of Educational Research and Improvement. (ERIC Document Reproduction Service No. ED 320 759); 1998.
36. Shepherd C, Speelman LR. Affecting environmental attitudes through outdoor education. Journal of Environmental Education. 1985;17(2):20-23.
37. Morgil I, Arda S, Secken N, Yavuz S, Oskay OO. The influence of computer-assisted education on environmental knowledge and environmental awareness. Chemistry Education: Research and Practice. 2003;5(2):99-110.
38. Harper CL. Environment and society: Human Perspectives on Environmental Issues. 4th edition, New Jersey, NJ: Prentice Hall; 2008.
39. Diamantopoulis A, Schlegelmilch BB, Sincorics RR, Bohlen GM. Can socio-demographics still play a role in profiling green consumers? A review of the evidence and empirical investigation. Journal of Business Research. 2003;56:465-480.
40. Jha PK. Manual for Environment Awareness Ability Measure. Agra: Agra National Psychological Corporation; 1998.
41. Morrison J. Environmental awareness of Waterville junior high school students. Colby College. Environmental Studies Dept, Doctoral thesis. Adviser(s) Cole, Rusell F; 2006.
42. Arcury T, Johnson T, Scollay S. Ecological worldview and environmental knowledge: The "New Environmental Paradigm". Journal of Environmental Education. 1986;17:35-40.
43. Arcury T, Johnson T. Public environmental knowledge: A statewide survey. The Journal of Environmental Knowledge. 1987;18(4):31-37.
44. Buttel FH, Flinn WL. The structure of support for the environmental movement 1968-1970. Rural Sociology. 1974;39:56-59.
45. Brooks DW, Lui D, Walter JL. Teaching chemistry on the internet; 1997. Available:http://horizon.unc.edu/projects/

monograph/cd/Science_Mathematics/Liu.asp (Copy ROM Article)
46. Mansuroglu S, Karaguzel O, Atik M, Kiniklim P. Determining environmental sensitivity of inhabitants of Antalya City, Turkey. Journal of Food, Agriculture and Environment. 2009;7(3/4):961-969.
47. Celen U, Yldiz A, Atak N, Tabak RS Arisoy M. AU Saglik Egitim Fak. Orgencilerinin cevre duyarliligi ve iliskili faktorler. Available:www.dicle.edu.tr//halks/m69.htm; 2002.
48. Yucel M. Adana halkinin cevreye duyarliginin belirlenmesi. Cukurova Universitesi. Ziraat Fakultesi Dergisi. 1994;25:121-136.

Peer-review history:
The peer review history for this paper can be accessed here:
http://www.sciencedomain.org/review-history.php?iid=818&id=21&aid=7414