Assessment of Environmental Awareness level among Secondary School Students in Tirunelveli District of Tamilnadu

C. MURUGESAN*[1] AND D. PACKIALAKSHMI[2]
[1]Research Scholar and [2]Principal
[1]Department of Education, Bharathiar University, Coimbatore (T.N.) India
[2]Sri Sarada College of Education for Women, Ariyakulam, Tirunelveli (T.N.) India

ABSTRACT

The purpose of this article is to identify the level of environmental awareness among secondary school students. One thousand two hundred and twenty-four students were selected through the stratified random sampling technique from various secondary schools of Tirunelveli district of Tamilnadu. Questionnaire technique is used to collect data using Environment Awareness Ability (EAT) test. The collected data are tabulated and results are compared using the statistical t-test for three dimensions: gender, school type, and home location. Results indicate that there is no significant difference in their level of environmental awareness among male and female students, but private and government school students, and rural and urban students. We also make some recommendations for further increasing the level of environmental awareness among school students.

Key Words : Environmental education, Environmental awareness, Secondary school students; t-test

INTRODUCTION

Earth is the only planet having all sophistication for all the living organism and non-living organism. Over a fast few decades, our environment is damaged due to many hazards. Air, water and soil pollution is exploding day by day. Degradation of environment results in many problems. World Health Organization (WHO) pointed out that more than six lakhs of children were affected by air pollution. Nowadays in Delhi, most of the vehicles are forbidden due to their air pollution. Most of the school children are wearing masks during travel. Irrespective of several measures taken by the government, still 55 tons of waste materials were disposed of every day in the famous Indian river Ganga.

Environmental awareness has come out from a number of continuous and undammed factors such as; population growth, environmental change, inequalities in development and political fragmentation and instability. Unfortunately, increase in Global Environmental Change

(GEC) within the atmosphere, geosphere, hydrosphere and biosphere are also associated with a whole series of major ecological problems such as; ozone depletion, global warming, rising sea levels, air pollution, soil erosion, desertification, deforestation, water shortages, toxic wastes, etc. outcomes from various responses to these environmental concerns has been the emergence of environmental education (Kumar, 2011 and Padmanabhan *et al.*, 2017)

The primary aim of environmental education is to create awareness among the citizens of a country and this can be achieved only by giving the proper environmental knowledge to the student society. In the formal education system teachers and students play an equally important role to achieve the goal of environmental related issues so they can get knowledge, attitude, and awareness toward the environment. Environmental awareness is the primary step to produce the students' ability to carry on responsible citizenship behavior.

The key to achieving this goal lies in environmental education and it's allied programmes, well-planned curriculum that has to be added to the syllabus separately from school level to college level. The primary objective of environmental education is to develop the world population aware of and concerned about the environment, and its associated problems, so that the pupil can get the knowledge, skill, attitudes, awareness, motivation and they will be ready to work individually and collectively towards the solutions of current and future problems (Soundararajan, 2013 and Kant and Sharma, 2013). In India, the curriculum for environmental education consists of not only the theories but also through different practical teaching methods are followed at primary, secondary and higher education levels with the help of an interdisciplinary approach, environment-related activities, seminars, and field trip and so on (Saha and Maji, 2013).

A number of research works have been undertaken to assess the level of environmental awareness among students in several states of the country. Dr. Sujit Bordhan conducted an environmental awareness study in the Kamrup district of Assam, using a sample of 158 secondary school students, with respect to gender, locality, and medium of study (Bordhan, 2017). It was found that the overall environmental awareness level was low (<50). Further, the environmental awareness level of female and urban students was higher than their male and rural counterparts. Regarding the medium of education, the environmental awareness level of Assamese medium students was higher than English medium. A similar study was conducted by Ritesh Jain in the Khargon district of Madya Pradesh, with respect to student's school type, medium of instruction, group and gender (Jain, 2015). The result showed that there is no significant difference in the environmental awareness level with respect to gender (male and female) and school type (public and government), but the group (arts and science).

In contrary, a study conducted by P.S. Balaji in the Thiruvallur district of Tamil Nadu, using a sample of 300 secondary level students, showed that male and English medium students possessed a higher level of environmental awareness than their female and Tamil medium counterparts (Balaji and Anbalagan, 2017). With respect to the student's locality (urban or rural), a study conducted by Bharambe (2013), using a sample of 300 students, showed that there is no significant difference between rural and urban students, contradicting with

Bordhan's (2017) findings. Gayatri (2014) conducted a study in the Chittoor district in relation to caste, father occupation, and class of study. Results showed that there is significant influence on the level of environmental awareness based on caste and father's occupation.

In the present context, the Tirunelveli district of the Indian state Tamil Nadu has been affected by several disasters in the recent years: 2014 by Tsunami, 2015 by Varda storm, 2016 by Ohgi storm, and in 2018 by Gaja storm, all are due to the severe changes that happened in the environmental eco-system. In the nearby Tuticorin district, people, including school students, made a strong protest against Sterlite, a copper smelting company that is known for making air-pollution everywhere. The company was closed by the Tamil Nadu Government. Therefore, there is a great need to protect and preserve our environment for our upcoming generation. So every student needs to be trained to save our environmental resources. The Tirunelveli district is also familiar for its traditional education system and so the district is known as the southern Oxford of education. Hence there is a great need for studying the environmental awareness level of secondary school students in the Tirunelveli district to reduce the environmental effects.

METHODOLOGY

The major objectives of the present study are:

1. To compare the level of environmental awareness among male and female students of secondary level in the Tirunelveli district.

2. To compare the level of environmental awareness among government and private school students of secondary level in the Tirunelveli district.

3. To compare the level of environmental awareness among science and arts disciplineof secondary in the Tirunelveli district.

The tool used in the present investigation is the Environmental Awareness Test (EAT) developed by Shabina Jinarajan (Bordhan, 2017), Bangalore University. This tool measures environmental awareness of students as comprising the following five components.

1. Causes of pollution (14).
2. Conservation of soil, forest, air, etc. (12).
3. Energy conservation (7).
4. Conservation of human health (15).
5. Conservation of wild-life and animal husbandry (2).

The numbers shown in parenthesis are the number

of questions in the corresponding component of the EAT, all summing up to 50 questions in the questionnaire. All the questions are of Yes or No types and carry equal marks. There is no negative mark for any wrong answer. A total of 1224 students (538 females and 686 males) studying in 9th and 10th classes were randomly selected for the present study. The students were selected both from government and private schools. We personally visited all the selected schools and met the students with school permission for explaining the purpose of this study and instructed them on how to answer the questionnaire. Also, whenever, they had a doubt in understanding questions, we made those questions understandable and clear. Using mean, standard deviation and "t" test analysis, we find out the significance difference among the students with respect to their gender, school type, and home location.

Correspondingly, following null hypotheses (H0) were formulated to assess the level of environmental awareness among the secondary school students in the Tirunelveli district:

1. There will be no significant difference in the level of environmental awareness among male and female secondary school students in Tirunelveli district.

2. There will be no significant difference in the level of environmental awareness among government and private secondary school students in Tirunelveli district.

3. There will be no significant difference in the level of environmental awareness among secondary school students schooling from rural and urban locations in Tirunelveli district.

RESULTS AND DISCUSSION

In this study, the level of environmental awareness of secondary school students is identified on the basis of EAT score. The calculated scores are also compared with respect student's gender, type of school and home location. The comparison of the mean and standard deviation of scores of this study with respect to different dimensions are summarized in Table 1-3 and also depicted in Fig. 1-4 using box-plots. The box-plots show the detailed statistics, such as the minimum, maximum, mean, and three quartiles (lower, median and upper), of the EAT scores across different dimension and student groups.

The first objective of the study was to compare the environmental awareness levels of male and female students. The corresponding hypothesis of this objective was that there is no significant difference in the level of environmental awareness among male and female secondary school students in Tirunelveli. Mean EAT scores are compared in Table 1 and Fig. 1. The t-test results from Table 1 reveals that the obtained t-value is 4.95 ($p = 0$), which is significant at 0.05 confidence level. Hence the null hypothesis was accepted. So we can conclude that there is no significant difference between male and female students. Also, the t-values are significant for all five dimensions of EAT, except for the conservation of wild life and animal husbandry.

The second objective of the study was to compare the environmental awareness levels of government and private school students. The corresponding hypothesis of this objective was that there is no significant difference in the level of environmental awareness among government and private secondary school students in

| Table 1: Results of t-test for various environmental awareness dimensions of secondary school students in relation to gender							
Dimensions	Gender	Count	Mean	Standard deviation	t-value	p-value	Accept H0?
Causes of pollution	Male	686	3.45	2.42	4.54	0.00	Yes
	Female	538	2.85	2.20			
Conservation of soil, forest, air, etc.	Male	686	2.44	1.93	2.18	0.03	Yes
	Female	538	2.21	1.71			
Energy conservation	Male	686	2.15	1.48	4.69	0.00	Yes
	Female	538	1.77	1.34			
Conservation of human health	Male	686	3.23	2.67	4.40	0.00	Yes
	Female	538	2.59	2.36			
Conservation of wild-life and animal husbandry	Male	686	0.53	0.60	0.95	0.34	No
	Female	538	0.50	0.57			
Total	Male	686	11.80	7.08	4.95	0.00	Yes
	Female	538	9.93	6.15			

Significant at confidence level 0.05
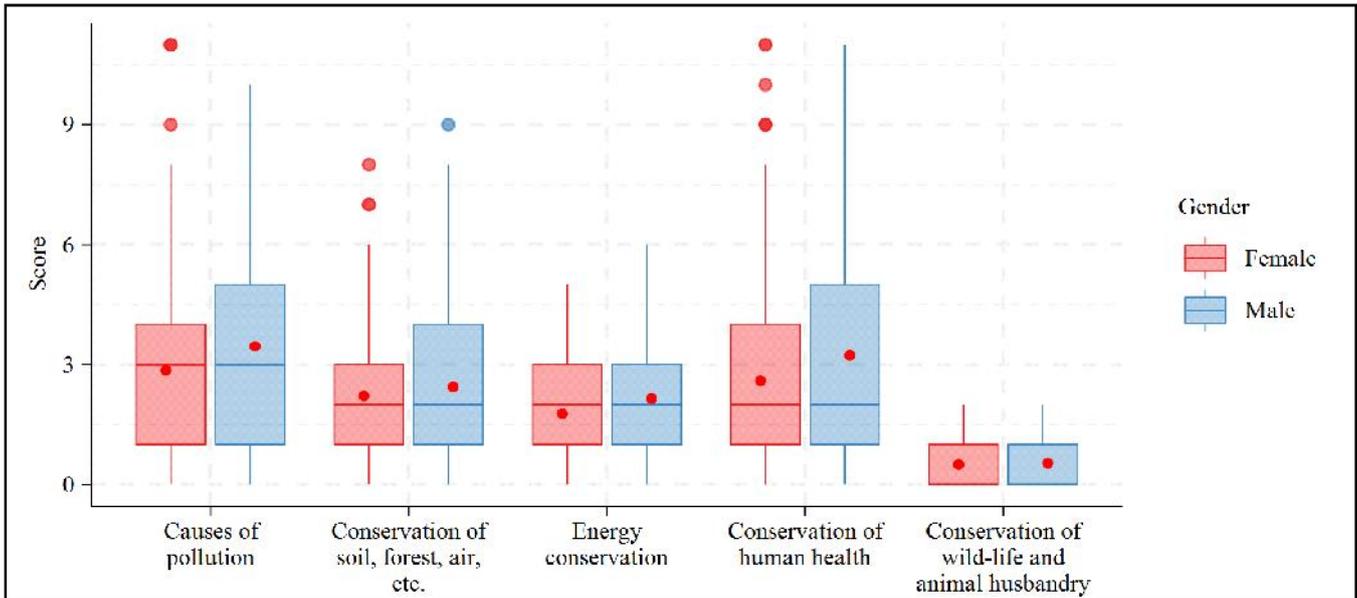
Fig. 1 : Box-plot shows the comparison of mean score for different environmental awareness dimensions in the EAT with respect to gender

Tirunelveli. Mean EAT scores are compared in Table 2 and Fig. 2. The t-test results from Table 2 reveals that the obtained t-value is -0.50 (p = 0.62), which is not significant at 0.05 confidence level. Hence the null hypothesis was rejected. So we can conclude that there is a significant difference between government and private school students. As the mean score (11.07) of private school students is higher than the mean score (10.87) of government school students, we can also conclude that the environmental awareness level of private school students is higher than government school

students. Table 2 also reveals that such difference exists for all dimensions of the EAT, except for conservation of soil, forest, air, etc. and energy conservation.

The third objective of the study was to compare the environmental awareness levels of students schooling from rural and urban locations. The corresponding hypothesis of this objective was that there is no significant difference in the level of environmental awareness among rural and urban students in Tirunelveli. Mean EAT scores are compared in Table 3 and Fig. 3. The t-test results from Table 3 reveals that the obtained t-value is -0.23 (p

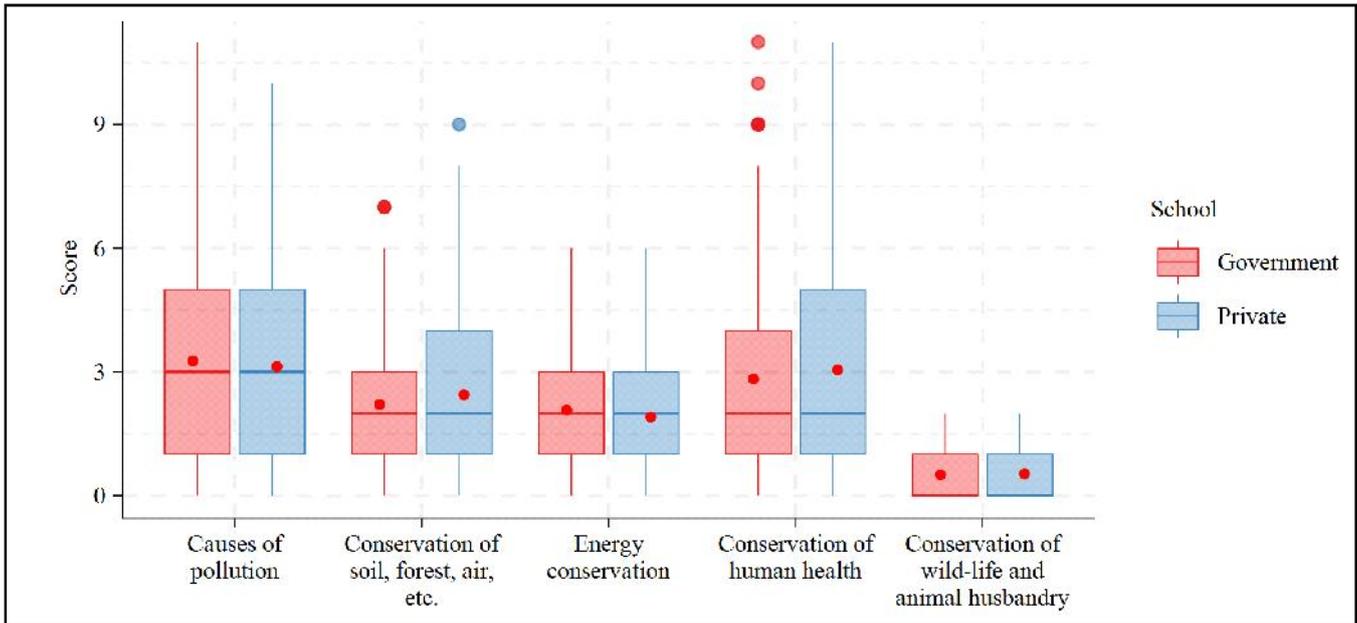| Table 2 : Results of t-test for various environmental awareness dimensions of secondary school students in relation to type of school							
Dimensions	School type	Count	Mean	Standard deviation	t-value	p-value	Accept H0?
Causes of pollution	Government	548	3.26	2.29	0.98	0.33	No
	Private	676	3.13	2.39			
Conservation of soil, forest, air, etc.	Government	548	2.21	1.65	-2.29	0.02	Yes
	Private	676	2.45	1.97			
Energy conservation	Government	548	2.07	1.35	1.98	0.05	Yes
	Private	676	1.91	1.49			
Conservation of human health	Government	548	2.83	2.32	-1.55	0.12	No
	Private	676	3.05	2.73			
Conservation of wild-life and animal husbandry	Government	548	0.51	0.58	-0.67	0.50	No
	Private	676	0.53	0.60			
Total	Government	548	10.87	6.06	-0.50	0.62	No
	Private	676	11.07	7.27			

Significant at 0.05 level

Fig. 2 : Box-plot shows the comparison of mean score for different environmental awareness dimensions in the EAT with respect to school type

Table 3 : Results of t-test for various environmental awareness dimensions of secondary school students in relation to student's home location

Dimensions	Location	Count	Mean	Standard deviation	t-value	p-value	Accept H0?
Causes of pollution	Village	728	3.11	2.22	-1.47	0.14	No
	Town	496	3.31	2.51			
Conservation of soil, forest, air,	Village	728	2.32	1.84	-0.54	0.59	No
etc.	Town	496	2.37	1.83			
Energy conservation	Village	728	2.04	1.42	1.67	0.09	Yes
	Town	496	1.90	1.44			
Conservation of human health	Village	728	2.96	2.55	0.10	0.92	No
	Town	496	2.94	2.57			
Conservation of wild-life and	Village	728	0.52	0.59	0.49	0.63	No
animal husbandry	Town	496	0.51	0.59			
Total	Village	728	10.94	6.56	-0.23	0.82	No
	Town	496	11.034	7.03			

Significant at 0.05 level

= 0.82), which is not significant at 0.05 confidence level. Hence the null hypothesis was rejected. So we can conclude that there is a significant difference between students schooling from rural and urban places. As the mean score (11.03) of urban students is higher than the mean score (10.94) of rural students, we can also conclude that the environmental awareness level of urban students is higher than rural students. Table 3 also reveals that such difference exists for all dimensions of the EAT, except for energy conservation.

Conclusions and Recommendations :

In this research, we attempted to identify the level of environmental awareness among secondary school students in the Tirunelveli district of Tamil Nadu, India. A survey questionnaire with 50 questions, based on the Environment Awareness Ability (EAT) test, was used to collect sample data from 1224 students across Tirunelveli. The collected samples were analyzed and compared using various statistical tools for three dimensions: gender, school type, and home location. The major findings are: a) there is no significant difference between male and
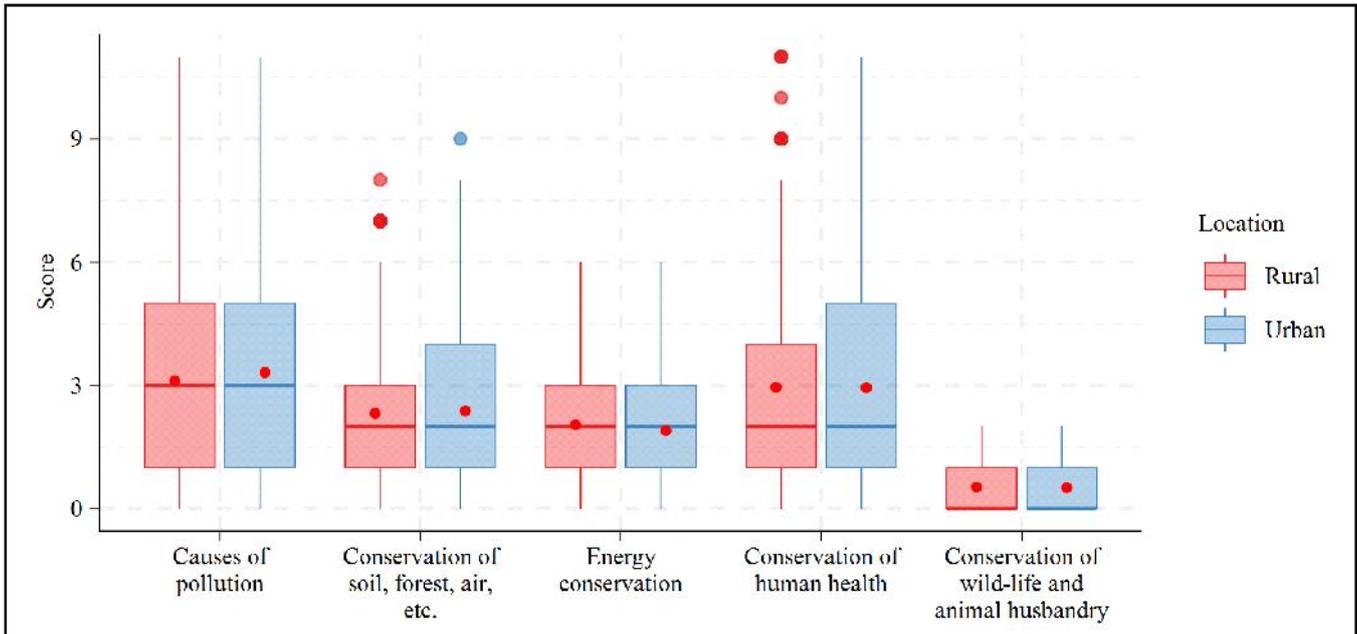
Fig. 3 : Box-plot shows the comparison of mean score for different environmental awareness dimensions in the EAT with respect to student's home location
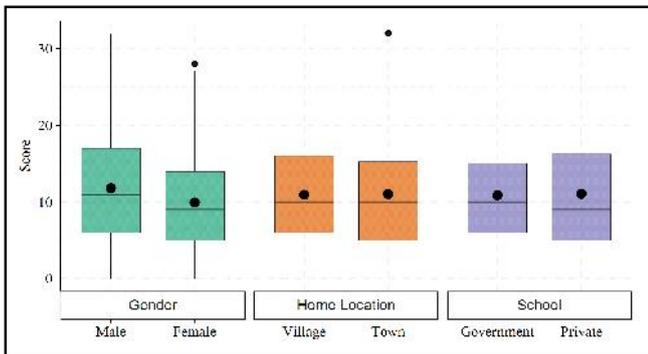

Fig. 4 : Box-plot shows the comparison of mean EAT scores (black dots within each box) for all three variables studied

female students; b) there is a significant difference between government and private school students, particularly the environmental awareness level of private school students is higher than government school students; c) there is a significant difference between students schooling from rural and urban places, particularly, the environmental awareness level of urban students is higher than rural students. Our findings are matches with some studies [gender (Jain, 2015) and home location (Bordhan, 2017)], but also differ [home location (Bordhan, 2017)] from other studies done in different parts of the country.

Based our findings, we also make some

recommendations: a) environmental awareness programs should be conducted by all levels of education by making a strong ordinance, e.g. world environmental day on June 5th should be celebrated in good manner; b) environmental education related seminar, symposium, and competition should be conducted from the primary level education to college level; c) environmental education related records should be maintained by every institution effectively then only the institution can get the affiliation, grants etc.; d) Three R (*Reduce, Recycle, and Reuse*] systems should be strictly followed by all the departments so that we can reduce much more environmental hazards; and e) like other subjects, environmental education also should cover the marking scheme in schools. Internal marks should be given according to their performance and the marks or grade points should be considered in to account for their higher studies. Further, by giving proper education to the tribal students living in the Western Ghats of Tirunelveli district we can also preserve the forestry.

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