

Environmental awareness among higher secondary students of Jabalpur

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ABSTRACT

The fast emerging economy of India is resulting in rapid degradation of natural environment and habitats, which can be tackled by an effective system of environment education. The present study measured environmental awareness by a standard tool in higher secondary students of Jabalpur, Madhya Pradesh. Most students of different disciplines studying in schools affiliated to both Central and Madhya Pradesh Boards of Secondary Education have recorded high levels of environmental awareness. There were no gender differences. The students of humanities had the minimum and that of biology or mathematics showed the maximum environmental awareness, which followed the order of Mathematics > Biology > Commerce > Humanities. The students of Central Board were better aware than those of Madhya Pradesh.

Keywords: Environmental Education, Environmental Awareness, Higher Secondary Students, Gender, Stream of Study, Central Board, Madhya Pradesh Board.

INTRODUCTION

India is a mega-diverse country due to its location at the tri-junction of the Afro-tropical, the Indo-Malayan and the Paleo-Arctic realms. With only 2.4% of the global land area, it harbours 8% of the documented global biodiversity, but is also home for 17% of the global human population (ENVIS, 2009). In its pursuit of becoming a rich and developed nation, India is experiencing multi-sectoral growth in agriculture, manufacturing, transport and urbanization in synergy with a geometric rise in its human population and degradation of its natural habitat (CMF, 2009; CPCB, 2009). The main hurdle in tackling the problem of environmental degradation in a developing country like India is not only the lack of scientific knowledge but also the will to act. Psychology attempts to train human societies to be less exploitive in their use of natural resources (Kruse, 1995) and miser in generation of wastes. The society needs to be educated about the importance of environment and sustainable development for ensuring a healthy and homeostatic environment for our future generations. Environmental education in this context can play a significant role in sensitizing people about the rationale use of natural resources and hazards of environmental pollution. A high environmental awareness especially among the young people may motivate them to adopt environmental friendly practices of living.

The chief objective of environmental education is that individual and social groups should acquire awareness and knowledge, develop attitudes, skills and abilities, and participate in solving real-life environmental problems. The lay public in rural, tribal slum and urban areas, students and teachers in schools, colleges and universities, and planners and policy makers need to be educated about their environment and its sustenance (Sharma, 2009). Therefore, it is very important to focus on environmental education of young students, who are the stewards of environment in the future. The present study has been conducted with the objective of comparing levels of environmental awareness among higher secondary students according to their stream of study, board of affiliation and gender in order to determine efficacy of the existing models of environmental education in India.

HYPOTHESES

The present study tested the following hypotheses:

There are no differences in environmental awareness of students between Central and Madhya Pradesh Boards of Secondary Education.

There are no differences in environmental awareness of students belonging to humanities, commerce, science with biology and science with mathematics streams.

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There are no differences between male and female students in their environmental awareness.

METHODS

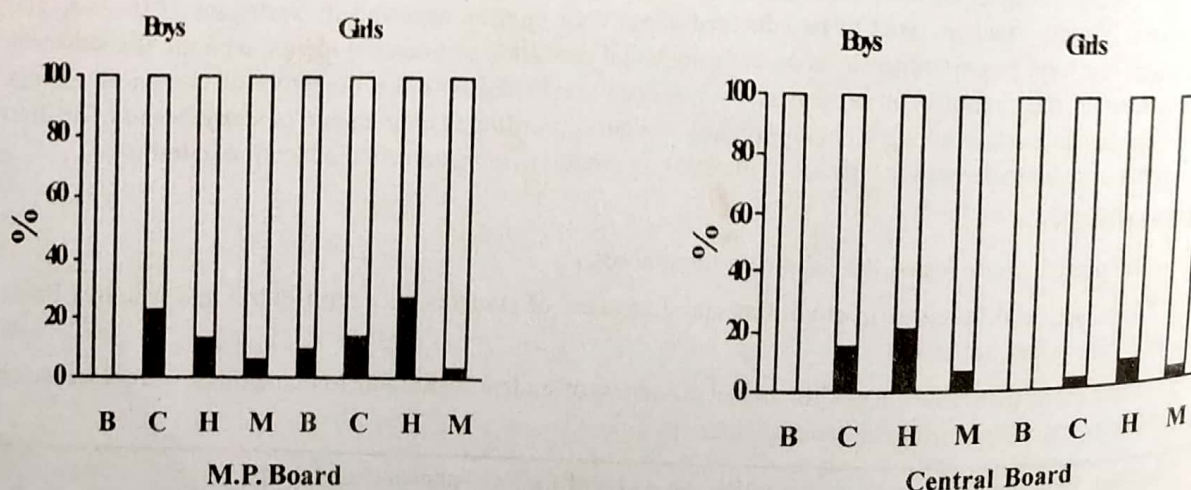
The present study was based on survey method and stratified sampling. The stratified sampling design provided due representation to gender, stream of study and board of affiliation. The sample for the present study consisted of a total 1,385 higher secondary students, selected randomly from thirteen schools (six affiliated to Madhya Pradesh Board and seven to Central Board of Secondary Education) located in the city of Jabalpur, Madhya Pradesh, India. Out of the total sampled students, 722 belonged to the schools affiliated to Madhya Pradesh Board and 663 to Central Board. The numbers of male and female students belonging to the Central Board were 13 and 42, 102 and 145, 18 and 12, and 168 and 163, respectively, in the discipline of biology, commerce, humanities and mathematics. The corresponding values for Madhya Pradesh Board were 11 and 86, 106 and 191, 15 and 78, and 108 and 127, respectively.

The questionnaire-based tool "Environment Awareness Ability Measure" (Jha, 1998) was used to measure environmental awareness among the students. The score of the tool ranged from 0 (minimum) to 51 (maximum). The tool could classify subjects into three discrete groups, i.e., low awareness (scores from 0 to 15), average awareness (scores from 16 to 36), and high awareness (scores from 37 to 51). On each sampling date, the selected students from a particular stream of study in a school were gathered in a separate classroom and were instructed for proper attempt of the tests. The completed test booklets were scored strictly according to the prescribed method using the scoring key provided with the manual. The scores so obtained were tabulated and processed by standard statistical methods (Garrett, 1981; Steel & Torrie, 1980; Snedecor & Cochran, 1989; Asthana, 2007).

RESULTS AND DISCUSSION

Environmental awareness of the boys ranged from 19 to 51 pursuing different disciplines in the schools affiliated to both the boards, while that of the girls varied from 21 to 51 and from 19 to 51 in the schools affiliated to M.P. and Central Boards of Secondary Education, respectively. According to the norms of the test, majority of the students belonging to all the streams have recorded high levels while none recorded low levels of environmental awareness in both the boards (Figure 1). These results are consistent with those reported by the earlier researchers (Kumari et al., 2006; Verma and Singhal, 2008). The inclusion of environmental education in syllabi of primary and secondary classes for the last two decades along with intense national and international efforts in improving its quality have considerably improved environmental awareness of students (Saxena, 1986; The Brundtland Report, 1987; Sarabhai et al., 2002; Sharma, 2006; Shrivastava, 2007).

Figure 1: Percentage of students with average (Dark) and high (Light) levels of environmental awareness pursuing biology (B), commerce (C), humanities (H) and mathematics (M) streams.



The students affiliated to Central Board of Secondary Education recorded significantly higher environmental awareness than those affiliated to the M.P. Board across all the disciplines and both the genders (Table 1). The critical ratio based on student's t test was significant in all the cases, except for the discipline of humanities where it was insignificant. Such results have clearly denoted that Central Board of Secondary Education has a better syllabus and comprehensive syllabus of environmental education across all the disciplines relative to that of the M.P. Board. Such differences between the two boards could also be assigned to the degree of subject's well being, the inequality and competence of the concerned parents. Since parents of most students of the Central Board are the employees of the Government of India, they might belong to more prosperous families having better educated and competent parents in comparison with those affiliated to the M.P. Board.

Table 1: Comparison of environmental awareness of students between boards.

Discipline/ Gender	Board	N	Mean	Standard Deviation	Critical Ratio
Commerce	Central	247	42.62	4.98	4.77***
	M.P.	297	40.66	4.60	
Humanities	Central	30	39.00	7.19	0.49
	M.P.	93	38.44	4.72	
Mathematics	Central	331	43.98	4.32	1.99*
	M.P.	235	43.27	4.00	
Biology	Central	55	44.62	2.48	5.93***
	M.P.	97	41.28	3.73	
Female	Central	362	44.05	3.93	9.42***
	M.P.	482	41.26	4.49	
Male	Central	301	42.44	5.21	2.38*
	M.P.	240	41.40	4.87	

* $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$

The impact of quality of the syllabi imparting environmental education on the level of environmental awareness has been further demonstrated by the observed significant differences in environmental awareness of students pursuing various disciplines of study in case of both the boards ($p < 0.001$, Table 2). It was the minimum for students studying in the discipline of humanities and the maximum for those studying in the discipline of mathematics or biology ($p < 0.05$, Figure 2). The students pursuing disciplines of biology, commerce and mathematics have generally not shown the significant differences ($p > 0.05$). Environmental awareness was in the order Mathematics > Biology > Commerce > Humanities (Figure 2). Similar findings have earlier been reported by the researchers (Ushadevi and Dhanya, 2009; Ziadat, 2010).

Table 2: Analysis of Variance table for comparison of environmental awareness among students of different disciplines.

A: M.P. Board of Secondary Education.

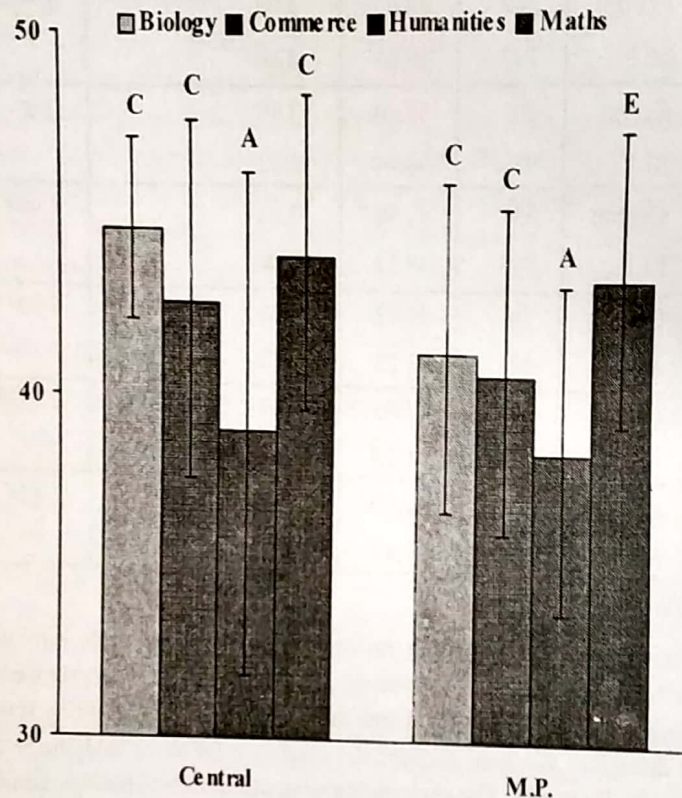
Source of Variation	Degrees of freedom	Sum of Squares	Mean sum of Squares	F ratio
Disciplines	3	1797.40	599.13	32.12***
Error	718	13391.94	18.65	
Total	721	15189.34		

B: Central Board of Education.

Source of Variation	Degrees of freedom	Sum of Squares	Mean sum of Squares	F ratio
Disciplines	3	914.50	304.83	14.25***
Error	659	14092.77	21.385	
Total	662	15007.27		

***p = <0.001

Figure 2: Comparison of environmental awareness (mean \pm standard deviation) among different disciplines in Central and M.P. Boards of Secondary Education. Means that differ significantly between disciplines at $p = <0.05$ are indicated by different alphabets (Duncan's New Multiple Range Test).



The girls recorded significantly higher level of mean environmental awareness than the boys only in the stream of commerce (42.11 vs. 40.64) and insignificantly higher levels in the humanities (38.74 vs. 38.12) and mathematics (43.98 vs. 43.37) (Table 3 and Figure 3). The gender differences were more pronounced in commerce stream (CR = 3.46, $p = <0.001$) and were statistically insignificant in humanities (CR = 0.56, $p = >0.05$), mathematics (CR = 1.73, $p = >0.05$) as well as biology (CR = 0.5, $p = >0.05$). Despite the well established fact that girls in comparison to boys are more perseverant towards their families and environment, the girls in the present study could not record significantly higher environmental awareness in comparison to the boys. There are conflicting reports about gender differences in environmental awareness. Soni (2004) and Ushadevi and Dhanya (2009) reported insignificant gender differences, while Verma and Singhal (2008) and Ziadat (2010) found girls to have better environmental awareness than boys. Since girls and boys of both the boards are taught the similar curricula in the same way, there appears to be no rationale for the gender differences in environmental awareness.

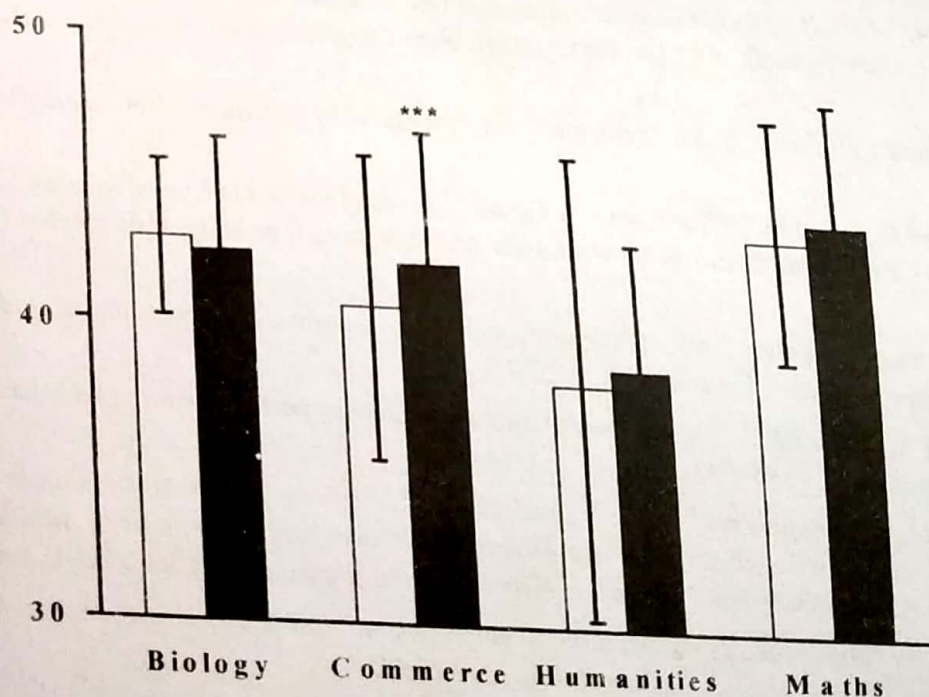
Table 3: Comparison of environmental awareness between genders.

Discipline	Gender	N	Mean	Standard Deviation	Critical Ratio
Commerce	Female	336	42.11	4.58	3.46***
	Male	208	40.64	5.19	
Humanities	Female	90	38.74	4.23	0.56
	Male	33	38.12	7.81	
Mathematics	Female	290	43.98	4.20	1.73
	Male	276	43.37	4.19	
Biology	Female	128	42.42	3.85	0.50
	Male	24	42.83	2.70	

***p = <0.001

Our research may support the earlier notions that the degree of urbanization, the level of subjective well being and the level of income inequality have direct effects on environmental awareness (Duroy, 2005). The role of families, societies, teachers and media in communicating enthusiasm and awareness about environmental action to the young people are the important factors in development of environmental awareness among the higher secondary students (Wray-Lake et al., 2008). Although higher secondary students in general have high levels of environmental awareness, but it is directly impacted by the subject of specialization. The students of humanities stream lag far behind those from science and commerce streams and need remedial environmental courses. M.P. Board of Secondary Education may review and reframe its environmental education syllabus. The syllabi of environmental education must include emerging problems of global warming, urban pollution and biodiversity loss. Such measures may ensure equitable contribution by these young students in sustainable development of the country.

Figure 3: Comparison of environmental awareness (mean ± standard deviation) between girls (dark) and boys (light) pursuing different disciplines.



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