



A Comparative Study of Scientific Attitude and Environmental Awareness Among Senior Secondary School Students of Jaipur City

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Abstract

Environment is a broad term. It includes biotic and abiotic component. Nowadays environmental problems are one of the most serious ones. Future society will face more troublesome situations and work harder to solve what we have done. Therefore, developing awareness through the education is the first step for starting to diminish the bad footprints of human beings on the Earth. Hence, how awareness of students could be developed and improved should be the key point of educational programs. Within this respect, the purpose of this study is to assess the relationship between environmental awareness of students and scientific attitude. The present study has been conducted to investigate the environmental awareness of school students with respect to their scientific aptitude. Result of the unscientific exploitation of natural resources by human being. There is an urgent need to create environmental awareness among all human beings to conserve, protect and nurture our environmental resources. Consequently the study was conducted on a random sample of 108 school students of Jaipur city. The finding of the study indicated that environmental awareness has positive with scientific attitude among students and Level of environmental awareness intern of components attitude significantly differ to each other. Female students have higher scientific attitude compared to male students.

KEYWORDS: *Environmental awareness; Environmental pollution; Environmental Awareness Ability Measure, Higher Secondary School Students, type of school.*

1. Introduction

The term 'environment' means, simply, nature, in other words, the natural landscape together with all of its non-human features, characteristics and processes. The environment is often closely related to notions of wilderness and of pristine landscapes that have not been influenced - or, at least, that have been imperceptibly influenced - by human activities. However, for other people, the term 'environment' includes human elements to some extent. In popular usage, the notion of the 'environment' is associated with diverse images and is bound up with various assumptions and beliefs that are often unspoken - yet may be strongly held. All of these usages, however, have a central underlying assumption: that the 'environment' exists in some kind of relation to humans. Hence the environment is, variously, the 'backdrop' to the unfolding narrative of human history, the habitats and resources that humans exploit, the 'hinterland' that surrounds human settlements, or the wilderness that humans have not yet domesticated or dominated.

In its most literal sense, environment simply means surroundings (environs); hence the environment of an individual, object, element or system includes all of the other entities with which it is surrounded. Thus the 'environment' may be regarded as a 'space' or a 'field' in which networks of relationships, interconnections and interactions between entities occur. The notion of interrelationship is a central one in environmental science, since many environmental issues have occurred because one environmental system has been disturbed or degraded - either accidentally or deliberately - as a result of changes in another.

Existence of human life is totally impossible without the existence of environment. On one hand environment influences the life of human beings and all their activities in one or other aspect, simultaneously on the other hand human beings also through their growth & development; and activities, desires & intentions for modification or adjustment influences the environment.

A number of initiatives were made; acts and policies were framed; projects and programmes were launched; special drives, campaign and activities were organised in this direction by all nations in order to ensure sustainable development; but despite all such efforts from various governmental, non-governmental and other agencies there found some studies by the researcher that reported contradictory and contrasting results in this context. Also the report – The Global Urban Ambient Air Pollution Database, released by World Health Organization (WHO) in June, 2016 showed that air pollution is mounting in India's upcoming towns and cities; and half of world's 20 most polluted cities are in India. While meeting the ever-growing needs, we put pressure on the environment. When the pressure exceeds the carrying capacity of the environment to repair or replace itself, it creates a serious problem of environmental degradation. If we use any environmental resource such as ground water beyond its limit of replacement, we may lose it forever. Therefore, there is a need to create 'awareness' about Environmental protection. While efforts are being made at the national and international level to protect our environment, it is also the responsibility of every citizen to use our environmental resources with care and protect them from degradation. Environmental resources are renewable and non-renewable. We have to be more cautious in consuming non-renewable resources like coal and petroleum, which are prone to depletion. All human activities have an impact on environment. But in the last two centuries or so, the human influence on environment has increased manifold due to the rapid population (J Wu *et al*, 2022; Sharma, 2021; Hoovinbhavi B.L, 2021; Chavada, 2020; Danielraja, R. 2019).

A study was conducted to evaluate the environment awareness and scientific aptitude among the students. This study is a survey study which is part of development research of character learning model based on education for sustainable development. The data were collected by using 21st century attitude questionnaire and environmental awareness self-assessment that given to school students in Jaipur city. In this study, an attempted has been made to investigate the environmental awareness in students in relation to the type of course, gender, and scientific aptitude. For this study, the sample consisted of 108 school students of Jaipur and all the aforesaid parameters were taken into consideration. The data collected was processed for statistical analyses through student's t-test.

2. Review of Literature

Education and Environment both are inter-related or inter-dependent because both mutually influence each other i.e. complimentary. Without education, how we can build an ideal environment for better living and without environment how we can organize education system systematically that means both are needed to understand. Education helps individuals to learn how to live, how to behave, how to organized, everything in their lives so it is an agent which brings change in environment. The environmental education conference at USSR in 1977 identified its ultimate aim as "creating awareness, behavioural attitudes and values directed towards preserving the biosphere, improving the quality of life everywhere as well on safeguarding heritage. Including holy places, historical landmarks, works of arts, movements and sites, human and natural environment, Including fauna and flora and human settlements.

Environment awareness has become very important issues on the international agenda since 1990s (J Wu *et al*, 2022; Sharma, 2021; Hoovinbhavi B.L, 2021; Chavada, 2020; Danielraja, R. 2019) Madruga, K., and Batalha da Silveira, C.F., 2003). As being capable to affect human beings and all living species (Gore, 1993 in O'zden, M., 2008), this nature's catastrophe had brought the serious implication towards the earth such as choking air pollution, water pollution in the vast majority of rivers, water shortages throughout much of the country, ocean pollution, mountains of solid and toxic waste, acid deposition spoiling land and water, destruction of the remaining scattered habitats, near-total deforestation, rampant overfishing, depletion of agricultural land, and conspicuous consumption of even highly endangered species for food and traditional medicine (Harris, P.G., 2006). The issues of environment are the effect from the human's activities that have no civic conscious and only think the profit without concern about the impact towards the environment and their future of life. The long term effect from the environmental pollution can be seen when the ecosystem is not able to endure the pollution (Zaini Ujang, 2008). According to Sardar and Ziauddin (1985), the major cause of this ecological crisis is regarding the value and belief in shaping human's relation with the surrounding and the lifestyle itself.

Realizing of the extremely expanded environmental catastrophe, a preventive way should be carried out to slow it and thereby mitigating long-term environmental damage (Harris, P.G., 2006). Thus, one of the best ways of preservation is by creating environmental awareness among society especially students as they are future leaders, future custodians, planners, policy makers, and educators of the environment and its issues (Thapa, B.,1999). Students are also the right aim as they were the one who's responsible to fulfill and realize the aspiration of the National Philosophy of Education (NPE) to develop high levels of personal well-being towards contribution to the harmony of society and nation (Curriculum Development Centre, 1990).

The most effective way of increasing the environmental awareness and consciousness is to educate the children as young and early as possible about the environment. To gain the necessary awareness, the students need to learn about the environment. Therefore, the education that can increase the environmental awareness initially aims to increase the environmental knowledge of the students and then develop the materials to provide this knowledge in the most effective way (Çelikkıran, 1997; Palmberg & Kuru, 2000). In the context of such education, the students could develop their knowledge about the basic qualities of environment in a systematic way (Türksoy, 1991). At this point, science education gains significance in terms of providing such education at schools, as, in developing environmental concepts and supporting potentiality of pro-environmental behaviour (Littledyke, 2008). Besides the formal education, the environmental awareness and positive attitude towards the environment should be started from students' close circumference and developed through informal education. This usually takes place in museums, zoos, nature centers, and field trips (Dierking & Falk, 1994; Kubota & Olstad, 1991; Orion, 1993). The main aim of informal education is to stimulate a change in the learning environment besides increasing the level of interest in science. Environmental awareness, is gained mostly through formal education at schools. In this context, the environmental education is provided in 4-8 grade science curriculum prepared by Ministry of National Education. There are main topics which are the world and universe, matter and energy, living organisms, and natural resources besides 45 concepts in relation to environment some of which are habitat destruction, habitat degradation, habitat fragmentation, deforestation, air pollution, water pollution, soil pollution, public awareness about environmental problems, recycling, environmental protection, and water cycle (Yılmaz, Boone, & Andersen, 2004), whether through formal or informal, education is the most important factor that affects people's attitudes and awareness towards the environment besides the other factors such as age, family, interest and others. When studying the literature, it is seen there have been many studies that examine the factors affecting environmental awareness, students' views in relation to environment and their awareness towards the environmental issues besides the attitudes of the students. In relation to the factors affecting environmental issues and environmental attitudes, in the literature, it was found out that some factors such as students' gender, age, or educational level significantly affect their attitudes towards the environmental issues (Ma & Bateson, 1999). Furthermore, Harold (1982) examined the affect of education on the environmental attitude. Specifically, he studied the effectiveness of ten-hour environmental instruction on 5th graders' environmental attitudes. He found that the students who had environmental instruction had significantly more positive attitudes than the other group who did not. Yılmaz, Boone, and Andersen (2004) also studies with 458 Turkish students from 4th grade to 8th grade to identify their views for environmental issues and whether some factors affect their views. They found that achievement in science courses was significantly affected from gender, family income, and the place they live and students' views towards the environment.

3. Statement of the Problem:

"A comparative study of scientific attitude and environmental awareness among senior secondary school students of Jaipur city"

4. Definition of the Terms Used

Environmental Awareness Environmental awareness is the characteristic quality of man to understand and know the ins and outs of working forces and conditions of the environment. Environmental awareness is indicative of one's conscious state of being towards one's own environment. In the present study environmental awareness includes both factual familiarity and personal variables as a composite whole. However, it has been defined operationally in the present study as follows:

Environmental awareness is an attitude towards environment which manifests itself in terms of the awareness towards pollution.

Scientific Attitude In the present study, scientific attitude has been operationally defined in terms of the following components-Rationality, Curiosity, Open-mindedness, Aversion to Superstitions and Objectivity

Research Questions

The main research problem was to examine the relationship of environmental awareness with scientific attitudes.

5. Objectives of the Study

The following were the main objectives of the study:

- (1) To study the nature and extent of environmental awareness among higher secondary students and Factors affecting it.
- (2) To study the relationship between environmental awareness and scientific attitudes among higher Secondary students.

6. Hypothesis of the Study

The following were the research hypotheses of the study:

- HR1: Demographic variables like gender affect the environmental awareness of students.
- HR2: Environmental awareness has relationship with scientific attitudes among students.
- HR3: The educational variables like course of study affect the environmental awareness of students.

7. Measurement of the Variables of the Study

The independent variable of this study is scientific attitudes of students while dependent variable is environmental awareness. This study is an attempt to highlight the relationship between environmental awareness and scientific attitudes.

8. Relationship among Variables

At the initial level, the study was concerned with the measurement of variables, selection of sample and the description of the sample. At the later stage, the study was concentrated on relationship between the independent and dependent variables, i.e. scientific attitudes and environmental awareness respectively. Population for this study consist of students of schools of Jaipur City. A sample is defined as a representative part (or subset) of the population selected for the observation and analysis. On the basis of characteristics of the sample, inferences can be made about the Characteristics of population in general. A sample is selected on random basis and study is conducted only on those members selected in the sample. This type of sample is the best representative of the population whose characteristics are unknown. Statistical Treatment In addition to general descriptive statistical analysis, other treatments such as t-test and correlation analysis were used to realise the objectives of the study.

9. Statistical Technique Used:

Mean, Median, Mode, Standard Deviation & t-test.

10 Analysis and Interpretation of Results

Analysis has been done with the help of various statistical techniques. The results are being discussed in the table below:

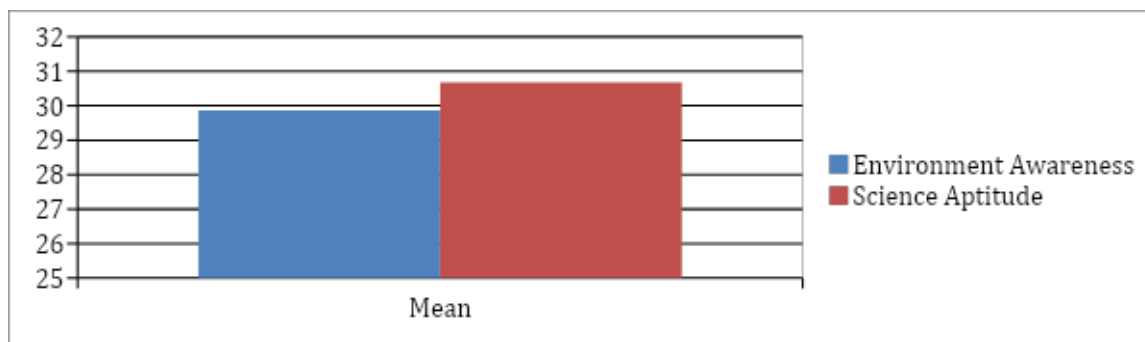
A. Relationship of Environmental Awareness and Science Attitude

The relationship between Environmental Awareness and Scientific Attitude was measured in 108 students individually. The mean scores of Environmental awareness and Scientific Attitude are 29.87 and 30.68 respectively where as the standard deviation (SD) of Environmental Awareness and towards science are 2.97 and 3.09 respectively.

The results shows that there is strong correlation between environmental awareness and science attitude as observed value of coefficient correlation (r) is 0.7651.

Table-1 Relationship of Environmental Awareness and Science Attitude

Variable	Number	Mean	S.D	t-value	Correlation Coefficient (r)
Environment Awareness	108	29.87	2.97	1.97	0.7651
Science Aptitude	108	30.68	3.09		

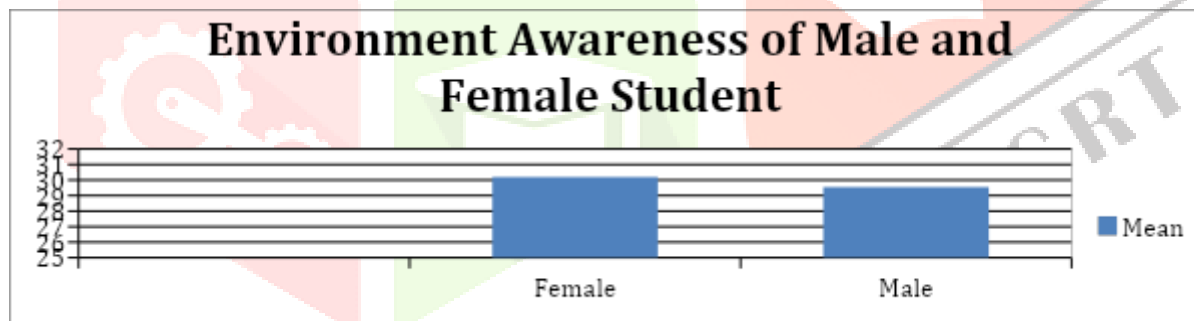


B. Comparison of the Environment Awareness of Male and female student.

Table 2 show that the mean of 54 female and 54 male students are 30.18 and 29.55 whereas the SD are 2.8 and 3.12 respectively. The mean of female students is higher than the mean of male students which indicates that the scientific level was found better female than male.

Table-2 Comparison of Environment Awareness of Male and Female Student.

Category	Number	Mean	S.D	t-value
Female	54	30.18	2.8	1.10
Male	54	29.55	3.12	



C. Comparison of Environment Awareness of Arts and Commerce Students

Table-3. shows that environment awareness score of 36 Commerce students have Mean 28.33 and SD 2.15 whereas 36 Arts students have Mean 28.77 and SD 2.16. It shows that there is no significant difference between two. So there is not any big difference of environment awareness in Arts and Commerce Students

Table 3: Comparison of Environment Awareness of Arts and Commerce Students

Category	Number	Mean	S.D	t-value
Arts Student	38	28.77	2.15	0.87
Commerce Student	28	28.33	2.16	

D. Comparison of Environment Awareness of Arts and Science Students

Table-4. shows that environment awareness score of 36 Arts students have Mean 28.77 and SD 2.15 whereas 36 Science students have Mean 32.5 and SD 2.63. It shows that the Mean of the Science Students is higher than mean of Arts students, it indicate that the environment awareness was found better science students.

Table 4: Comparison of Environment Awareness of Arts and Science Students

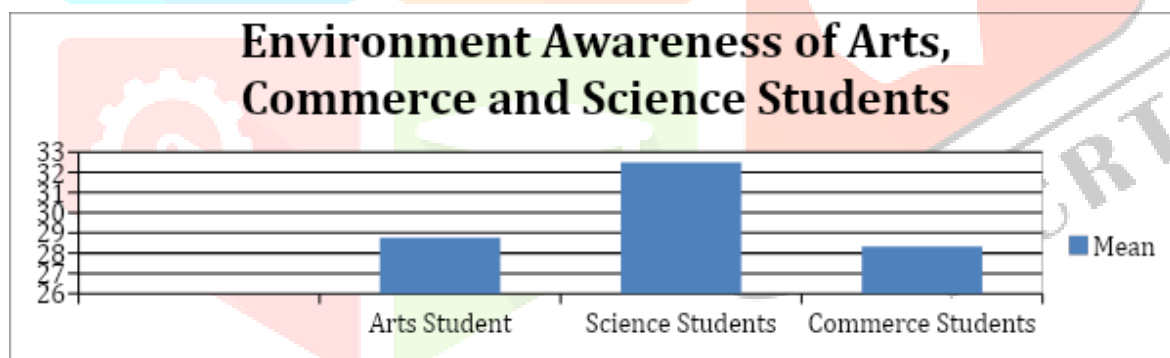
Category	Number	Mean	S.D	t-value
Arts Student	38	28.777	2.15	6.56
Science Students	34	32.5	2.63	

E. Comparison of Environment Awareness of Commerce and Science Students

Table-5. shows that environment awareness score of 36 Commerce students have Mean 28.33 and SD 2.16 whereas 36 Science students have Mean 32.5 and SD 2.63. It shows that the Mean of the Science Students is higher than mean of Arts students, it indicate that the environment awareness was found better science students.

Table 5: Comparison of Environment Awareness of Commerce and Science Students

Category	Number	Mean	S.D	t-value
Commerce Students	28	28.333	2.16	7.33
Science Students	34	32.5	2.63	



11. Conclusion and Discussion

The findings of the study revealed that the students of Jaipur city possessed good average level of environmental awareness. Further, the result clearly indicate that a strong relationship between the environmental awareness and scientific attitude. Female students have higher environmental awareness compared to male students. It is also observed that the science students have higher environmental awareness than the Arts and commerce students. it indicate that scientific attitude was found better in science students. Similar findings were reported by Jing Wu *et. al*(2022) Sharma (2021), Hoovinbhavi B.L, (2021), Arunkumar (2012), Abbas and Singh (2014), Altin *et. al.* (2014) and Sharma (2014) through the earlier studies conducted in this context by these researchers. It shows that the initiations and steps taken by various governmental and non-governmental agencies towards development of environmental awareness among students is proving fruitful as all studies reported possession of quite average level of environmental awareness by students. The findings of the study revealed that there exists significant difference in the level of environment awareness among undergraduate students in relation to their stream of study. The findings of the study are in consonance with the findings of the study conducted by Chavada (2020), Danielraja, R. (2019), Simmons (1998), Yilmaz *et. al.* (2004), Sebastian & Nima (2005), Sengupta, Das & Maji (2010), Astalin (2011), Pillai (2012) and Sharma (2014); but in contrast to the findings reported by Khalid (2001) and Pandey (2014). The present study also reported high mean score in level of environmental awareness by students studying in science

stream as compared to students studying in arts and commerce streams (non-science streams) and that findings are in consonance with the findings reported by Sebastian & Nima (2005), Astalin (2011), and Sharma (2014); but in contrast to the findings reported by Sengupta, Das & Maji (2010). It may be due to the more exposure of science stream students (than non-science stream students) to environment related contents and activities through their curriculum in their stream specific courses.

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