

A STUDY OF ENVIRONMENTAL EDUCATION AWARENESS AND ITS IMPACT ON BIOLOGICAL SCIENCE ACHIEVEMENT IN SECONDARY SCHOOL STUDENTS

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Abstract

Man has been a discoverer since the beginning of life on earth. He has gradually kept on finding new discoveries and findings for the betterment of mankind, either by chance or by choice, thus he kept progressing and evolution took place. In his journey of discovery man invents new things and simultaneously keeps on exploiting nature. This has been happening due to over indulgence of mankind in nature. Thus, he has delved into nature so much that he has exploited it to maximum. It becomes our responsibility thus, to become an ambassador of knowledge and environmental protection and to develop it sustainably. We must make our fellowmen aware of the importance of environmental conservation and protection, so that we can sustain the environment and develop it for the access of next generations. The present study focuses on the environmental awareness and its impact on biological science subject achievement and thus is an empirical study based on experimentation and observation. 120 students of class ninth of select schools of Hyderabad had been taken as sample. They had been tested for their awareness of the environment; thus, they had been informed and trained through teaching interactive sessions, activities and assignments and then the students' achievement of marks in related subject such as biological science achievement tests were conducted. Topics such as environmental protection, environmental pollution, environmental problems and how to take care of the environment had been taught. It was found that the students who possessed/ had a good knowledge of environmental awareness were good in/at their performance and achievement of/in biological science subject. This is also a fact that most of environmental studies comprises of biological facts related to biotic and abiotic factors in human surroundings. Environmental pollution, environmental conservation and protection, natural resources, bio-geo-chemical cycles in the universe, plants and energy, energy conservation and production are all topics that are some or the other way are taught in the disciplines (subjects) of school education and higher education. It also includes basics of environmental education and environmental protection.

Introduction

Environmental awareness means an awareness of our natural surroundings and our choices that help us to promote its well-being without causing much harm to it. It is also the awareness that the earth is in need of protection of its survival [1]. The methods to practice environmental awareness include using safe and non-toxic building supplies, conserving energy and water, recycling activism, etc. [2]

Environmental awareness is essential to demonstrate how humans can protect and preserve their natural resources [3]. Educating the population can reduce the use of plastics and water wastage while promoting recycling to reduce landfill waste. By demonstrating how plastic use, water wastage prevention and effect of global warming on the planet will impact future generations environmental awareness can sensitize and trigger changes in their behavior and attitude towards nature [4].

Environmental education, though is an ancient subject as old as humanity, but its modern objectives have changed to the over indulgence of human endeavors into nature. Environmental education has now become a relatively new field of knowledge that many disciplines have been connected with it. It is associated with the socio-politico-economic culture of different nations of the world. It includes many sciences. It equips individuals with knowledge, attitude, skills and motivation that helps us solve environmental problems. The aim of environmental education is to bring a change in every individual for a better living in a better environment. The term environment includes all the external conditions that effect human life. It includes all organic and inorganic substances [5].

Definition of environmental education

The national advisory council of environmental education (USA) defines environmental education as “it is a domain of acquiring knowledge, problem-solving skills and develops tenderness, motivational feelings of responsibility for informed decisions and responsible action”.

Environmental education emphasizes personal and social decision making.

US Environmental Protection Act (1970) it defines environmental education as an educational process that shows the relationship of man with nature and the human environment including population, pollution, supply, conservation, transportation, economy and banking, urban and rural planning and all other human activities [6].

According to IUCN: Environmental education is the process of identifying values and classifying concepts. Its chief focus is on the comprehension of biological, physical environment of students with relation to human civilization [7].

The American States Conference on Education and Environment in America 1974 – this conference had defined environmental education as teaching value judgement and a clear thinking of complete environmental problems through environmental education. Environmental education is a method adopted for the purpose of environmental protection, it is not a separate subject, but a unifying principle of life.

The aim of environmental education is to make the child fully aware of the physical and social environment. Environmental education in our country is started from primary grades. The Kothari Commission views that Environmental education is provided by the practice of elementary arts and crafts in addition to the study of environmental activities such as creative activities-skills in natural sciences, physical sciences, geography, history, political science and public administration [8].

The purpose of environmental education is to create awareness among the public about the environment, so that a healthy environment can be provided to all. Finding solutions to the problems in the environment in the foundation years of life can lead a long way ahead towards the environment.

The dependence of humans on ecology (Environmental study) highlights the individual's environmental knowledge, values, attitudes, responsibilities and skills thus protecting and improving the environment through promotion of new contemporary trends in individuals. It promotes environmental awareness in the group and society.

Objectives of the study

1. To do a comparative study of environmental education awareness among male and female students of class ninth.
2. To analyze the biological science achievement of class IX students.
3. To assess the impact of environmental education awareness of class IX students on the achievement of biological science subject.
4. To assess the level of understanding of environmental education in secondary school students.

Hypothesis of the study

1. There is no significant difference in the environmental awareness among male and female students of class ninth.
2. There is no significant difference in the student's achievement of biological science subject.
3. There is no significant impact of awareness of environmental education awareness on the achievement of biological science, in the students of class ninth.

Variables

There are two variables in this study one, the independent variable is gender and the other is dependent variable that is achievement in biological science subject.

Independent variable: A variable that stands apart and is not changed by the other variables being measured, e.g., age, gender. Independent variables are those that we expect will influence dependent variables. Independent variables are also called "stimulus" or "input".

Dependent variable: a dependent variable is that which happens as a result of the independent variables.

A dependent variable is something that depends on other factors. For example: an outcome of an interest for a study. A dependent variable depends on the independent variable. Dependent variables are also known as response or output.

Methodology: In this research survey method was used for the study.

Population: Students of Urdu medium schools of Hyderabad are included as the population of study.

Sampling: Sampling or sample size is the selected number of individuals or objects for the study under consideration. Simple random sampling from ten government schools were selected in Hyderabad for this study. Hundred and twenty students of class IX were selected as sample. Sixty were boys and sixty were girl students.

Tools: a questionnaire comprising a sequence of successive questions were taken as a research tool. The result of the questionnaire tool was obtained from individual students in their classroom situation, with the permission of the H.M. and class in-charges.

Statistical Techniques used: Mean, Standard Deviation and T-Test were used in the statistics.

Limitations of the Study:

The study is limited only to Urdu Medium Schools.

The study is limited to only schools in Hyderabad.

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The study is only limited to students of Class IX.

Review of Literature

Previous literature related to the topic is taken as reference for further study. The research done in the relevant field is studied for validation and verification to be done in similar research.

Emanuel (1980) A study of effectiveness of environmental education on science subject teachers. Objective was

1. to evaluate the quality of ecological study.
2. To study the impact of environmental education on students' intelligence
3. To find out the awareness among rural and urban students

The findings of this study showed that rural students had more environmental awareness than the urban students of secondary schools.

Joshi B P SIE (1981) The impact of environmental education of science subject on secondary school students.

To study the need and impact of environmental education at secondary level.

Environmental education has been made mandatory at the national level to develop the necessary skills in students of secondary schools. It also promotes the awareness of environmental importance among students.

Gupta et al (1981) A comparative assessment of environmental awareness among citizens and students.

Objectives of the study

1. To study the environmental awareness of urban and rural students.
2. To find out the environmental awareness of students in relation to formal and non-formal educational institutions.

Results of this study showed that the students of rural schools have greater environmental awareness when compared to urban school student's environmental awareness. Students of non-formal education, have greater environmental education when compared to students of urban schools.

A Gupta (1986) A study of attitude of teachers towards environmental education [9].

Objectives:

1. To find out the attitude of teachers towards environmental education.
2. To assess the attitude of environmental education of teachers.

3. To compare the attitude of environmental education of teachers of different levels of education.

Result: The attitude of all the teachers towards environmental education is favorable. The mean value of senior secondary school teachers is less compared to secondary school teachers and the value of mean of secondary school teachers towards environmental education is comparatively less than the mean value of primary school teachers.

Shah Nawaz (1990) A study of Environmental awareness and attitude of secondary school students towards environmental education [10].

Objectives: Assessment of environmental awareness among students of teachers of secondary schools.

1. To find out the attitude of students and teachers towards environmental education.
2. To find out the difference of environmental awareness among male and female students.

Result: 95% teachers and 94% students have positive attitude towards environmental awareness was high among teachers. Girls were found to have more environmental awareness than boys.

Zeenath Kidwai (1991) Curriculum development of Geography subject of secondary level based on environmental studies [11].

Objectives:

1. To study the physical, biological, economic, cultural and social aspects of environment and comprehension of their correlation.
2. To prepare individuals with environmental consciousness who can protect the environment.
3. To create individuals and social networks who can identify and possess skills and abilities to solve problems related to the environment.

Result; An intermediate level, geography curriculum based on environmental concepts was presented.

Gopal Krishna, Sarojini (1992) The impact of environmental education on undergraduate students [12].

Objectives:

1. To identify the major components of the environment.
2. To assess the importance of environmental education.
3. To find out the effectiveness of experiential learning through analytical study.

4. To obtain teacher's reactions to environmental education.

Result:

1. The general observation shows that the method of environmental education was found to have a positive effect on the students.
2. Experiential learning has a better effect on students regarding environmental education.
3. Students associated with environmental education performed better in the test taken from the general population.

Rambabu Dharavath (2004) A study of awareness among high school students about environmental awareness and environmental protection in Hyderabad.

Sample size 600 students from a population of 20 secondary schools in Hyderabad.

Methodology: Statistics based on percentage.

Findings: Government madrasas and private madrasas among high school students when compared, the environmental awareness in private schools is higher. Tenth class students' environmental awareness is higher compared to ninth class students.

Sandhya Gihar (2006) A study of environmental responsibility among students [13].

Objective:

1. To study the level of responsibility among students regarding environmental protection and environmental pollution based on their gender.
2. To study the level of responsibility among students regarding environmental protection and environmental pollution based on their locality of residence.
3. To study the level of responsibility among students regarding environmental protection and environmental pollution based on their stream of subject.

Result:

1. The environmental responsibility of boys is greater when compared to girl students.
2. The environmental responsibility of science students is comparatively greater than the students of other streams.

Methodology and research design

Methodology of the research

A process/ method of carrying out the research is called methodology of the research. The procedure of data collection from the population, the sample, the tool and the process or method of quantitative and qualitative or otherwise, finding in the form of statistics is called methodology of research.

The result of a research ultimately depends on the method and technique. If we utilize the right procedure, we get the right result. Therefore, it is important that we use a suitable and standard tool for the research.

There are basically three types of research methods.

1. Historical research
2. Descriptive research and
3. Experimental research.

The method used in this research is descriptive survey method. It is generally used to study a sample of large size, so that many individuals can be studied.

Survey method is used to identify and represent upon the sample at random generally so that the maximum population is considered to select at random. A survey is an attempt to collect data from the members of the population in order to determine the current status of that population with respect to one or more variable. (L.R. Gay) [14].

Sampling: Random selection was done for sampling in this research, from a huge population. 120 individuals of which 60 male and 60 female were selected for study as a sample in this research.

Girls	Boys	Total
60	60	120

Table 1: Population size of the research

Questionnaire: A questionnaire is a tool for the researcher to test the hypothesis of the study. A close ended questionnaire is used here, comprising of thirty questions/ items. Each question is based on yes or no as answer.

Tool: A standard tool of environmental awareness ability measure (EAAM) prepared by Dr. Praveen Kumar Jha was used as the standard tool of research.

Statistical techniques: the researcher had taken ten Urdu medium schools of Hyderabad as a sample study. Sample size 120 students. The data collected was calculated to achieve mean, standard deviation and t-test.

$$\text{Mean} = \frac{\sum X}{N}$$

$\sum X$ = Total marks achieved

N= Number of marks

Standard Deviation

$$s = \sqrt{\frac{1}{n-1} \sum_{i=1}^n (x_i - \bar{x})^2}$$

where n is the number of observations obtained in the sample, x_1, x_2, \dots, x_n are the obtained observations and \bar{x} is the sample mean.

Two sample t-test

$$t = \frac{M_1 - M_2}{\sqrt{\frac{\sigma_1^2}{N_1} + \frac{\sigma_2^2}{N_2}}}$$

M_1 = mean of first group

M_2 = mean of second group

σ_1 = standard deviation of first group

σ_2 = standard deviation of second group

N_1 = Number of scores of first group

N_2 = Number of scores of second group

Data analysis

Data Analysis is the most important part of the research. After collection of the data, based on the observation and data noted the data has to be analyzed for the achievement of the result.

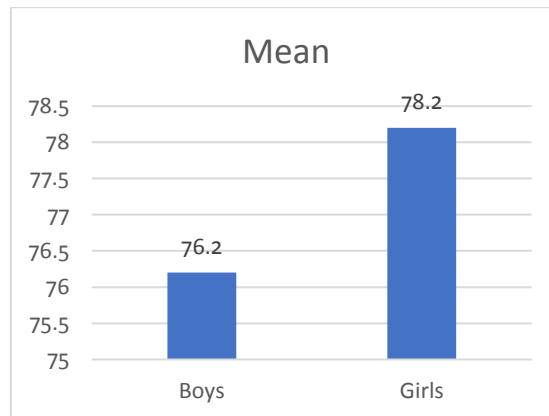
For subjectivity to be negated the researcher has used critical analysis type of data analysis.

The process of interpretation is essentially one of the methods of stating the result. The result shown has mean, the significance of related data and achievement of the result i.e., answer to the original problem. This is called research findings

Environmental awareness in boys and girls

Gender	Number of students	Mean
Boys	60	76.2
Girls	60	78.2

Table 2: Mean of Environmental awareness in boys and girls

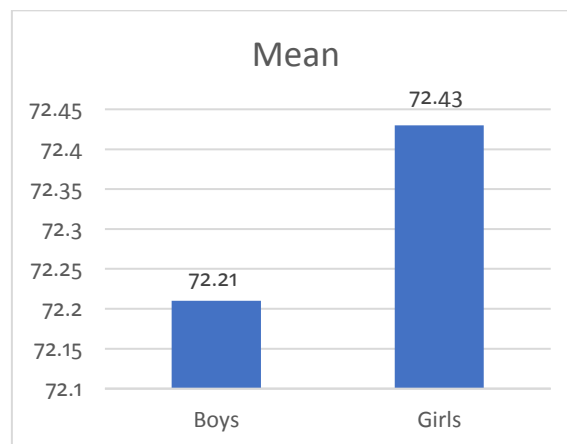


Graph1: Mean of Environmental awareness in boys and girls

Mean derived from the scholastic achievement in biological science in boys and girls' performance through test.

Gender	Number of students	Mean
Boys	60	72.21
Girls	60	72.43

Table 3: Mean of scholastic achievement in biological science in boys and girls

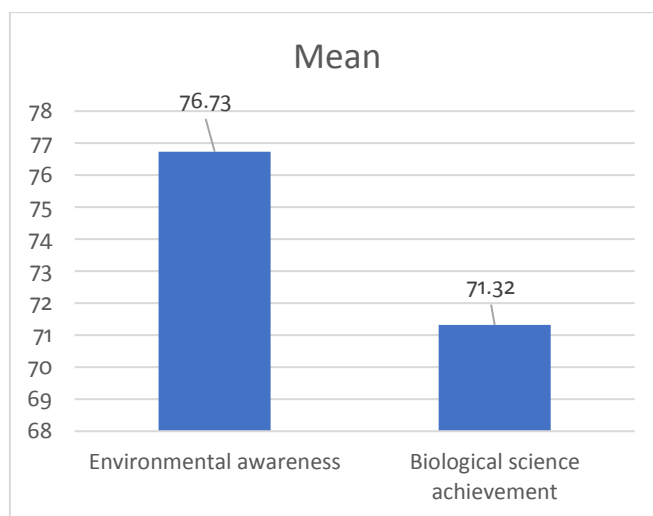


Graph 2: Mean of scholastic achievement in biological science in boys and girls

Impact of environmental awareness of students on their achievement in biological science subject

Domain	Number of students	Mean
Environmental awareness	120	76.73
Biological science achievement	120	71.32

Table 4: Mean of Impact of environmental awareness of students on their achievement in biological science subject



Graph 3: Mean of Impact of environmental awareness of students on their achievement in biological science subject

t-test for environmental awareness of boys and girls

Gender	No. of students	Mean	S.D.	df	't' value	t table value 0.05 to 0.01	Level of significance
Boys	60	76.2	7.68	98	1.35	1.99	Insignificant
Girls	60	78.2	8.17			2.63	

Table 5: t-test for environmental awareness of boys and girls

From the table above it is found that in students of ninth class girls environmental awareness mean is 78.2 and boys environmental awareness mean is 76.2. The difference between the mean value is insignificant.

The null hypothesis that there is no significant difference between the environmental awareness of boys and girls of class nine is accepted.

t-test for scholastic achievement in biological science in boys and girls

Gender	No. of students	Mean	S.D.	df	't' value	t table value 0.05 to 0.01	Level of significance
Boys	60	72.21	7.92	98	0.19	1.99	Insignificant
Girls	60	72.43	8.24			2.63	

Table 6: t-test for scholastic achievement in biological science in boys and girls

From the table above it is found that in students of ninth class girls scholastic achievement in biological science mean is 72.43 and boys scholastic achievement in biological science mean is 72.21. The difference between the mean value is insignificant.

The null hypothesis that there is no significant difference in the scholastic achievement of biological science of boys and girls of class nine is accepted.

t-test for Impact of environmental awareness of students on their achievement in biological science in boys and girls

Domain	No. of students	Mean	S.D.	df	't' value	t table value 0.05 to 0.01	Level of significance
Environmental Awareness	120	76.73	7.96	98	4.78	1.99	Significant
Biological science achievement	120	71.32	8.05			2.63	

Table 7: t-test for Impact of environmental awareness of students on their achievement in biological science in boys and girls

From the table above it is found that in students of ninth class environmental awareness mean is 76.73 and biological science achievement mean is 71.32. The difference between the mean value is significant.

The null hypothesis "There is no significant impact of awareness of environmental education awareness on the achievement of biological science, in the students of class ninth" is rejected.

Findings

Findings get us acquainted with the balanced result of the research done. They produce a comparative picture of complete research done by the researcher on a study which reflects the objectives.

The objectives of the study via the statistical data analysis take us towards the findings of the research done.

As per the objectives of the study in the research it was found that class ninth students are aware of environment. No significant difference was found in the awareness of environmental education among boys and girls of class ninth.

The mean of awareness of environmental education in boys is 76.2 and in girls is 78.2. the t-value is 1.35.

There was no difference found in the biological science achievement among male and female students of class ninth.

The average of biological science achievement of boys was 72.26 and in girls is 72.43.

The t-value was found to be 0.19.

Conclusion

From these findings it is evident that the awareness of environmental education among the ninth-class students has an impact on the achievement of biological science achievement. The mean of environmental education awareness among ninth class students is 76.73 and the mean of biological science achievement is 71.32. The t- value is 4.78 which shows that the environmental awareness had an impact on the achievement of biological science.

Recommendations

Similar research should be done on environmental awareness impact on other group students such as primary school students.

Such research can also be done on higher education students such as senior secondary students and degree college students.

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