

## **An Exploratory Study in Educating High School Children towards Maintaining an Eco-Friendly Environment**

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### **Abstract**

An exploratory study in educating high school children towards maintaining an eco-friendly environment was conducted as a part of Bhavya's Doctoral research by Dr. K. Purnima and Smt. Bhavya N. Children are the citizens of tomorrow and a great responsibility of protecting the environment rests on their young shoulders. Hence, this study evolved. The objectives were: To compare the pretest and posttest knowledge of the high school children about environment, its pollution and conservation; To compare the pretest and posttest attitude of the high school children about environment, its pollution and conservation; To compare the pre test and posttest practices of the high school children about environment, its pollution and conservation; To compare the knowledge, attitude and practices of the high school children of the five schools about environment, its pollution and conservation. Four hypotheses were formulated stating that there is no difference between the pre test and posttest knowledge of the respondents about environment, its pollution and conservation; there is no difference in the pre test and posttest attitude of the respondents about environment, its pollution and conservation; there is no difference in the pre test and post test practices of the respondents about environment, its pollution and conservation and there is no difference in the pre and post test knowledge, attitude and practices of the respondents of the five schools. The five schools taken for the study were Mangalavada, Mugadalabetta, CK Pura, Gujjanadu and KT Halli, which were randomly selected in Pavgada Taluk, Tumkur District, Karnataka. adolescent boys and girls studying in 9th standard, numbering 300 were selected using the Purposive Random Sampling technique. Questionnaire was used as tool, developed both in English and Kannada, which consisted of basic information about the respondents followed by five sections in which a total of 119

objective type questions were framed and distributed. The experimental group consisted of 152 children from all the five school together.

Very interesting results have been observed from the present study undertaken for 9<sup>th</sup> standard children from the five schools in Pavagada Taluk.

The mean scores and t value of the pre and post tests under different dimensions of the environment regarding the experimental group showed high significant difference in mean scores with regard to pre test and post test analysis under the five dimensions - eco-system and environment, air, water, land, energy and resource conservation and picture perception, and also attitude and practices towards the eco-friendly environment.

The overall mean scores were significantly much higher in the post test analysis than the pretest, showing that the intervention program was extremely useful and educative to the experimental group.

The standard deviation of almost all the dimensions and attitude and practices were significantly lesser in the post test, showing that the post test values were more homogenous, since they showed less variability than the pre test scores.

The **t** values were significant at 1% level for all the five dimensions as well as attitude and practices in all the five schools towards the eco-friendly environment.

The above study gives a clear picture of the improvement regarding knowledge, attitude and practices about the eco-friendly environment and has inculcated better knowledge, positive attitudes and better practices among the children.

**Key words:** adolescents and knowledge of environment, eco-friendly concept of environment, attitude and practices towards eco-friendly environment.

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## **Introduction**

The environment in which we live in is a complex and a dynamic one in which all forms of life are interdependent on each other. Deep and harmonious relationship exists between man and environment.

The term environment means the surroundings of an organism. It includes both living and non-living components such as land, air, atmosphere, water, and by living components like plants and animals. Further, the environment includes the pollutants, and other factors that adversely affect our life. Environment refers to the sum total of all the forces, materials and influences around us at a given point of time and place.

Ecosystem is essentially a technical term for 'nature'. Ecosystem is a self-regulating and self-sustaining structural and functional unit of the biosphere. This system depends upon the sun for its energy.

Environment is the sum total of all conditions and influences that affects the life and development of organisms.

The earth is the only planet known in the entire universe capable of supporting life. The three basic amenities for living organisms are air, land or soil and water-which are found in our mother earth. But in his quest to improve the quality of his life, man has polluted all these essential components of earth.

Man is considered as an integral part of nature and there should be harmony & not hostility between man and environment. Man started interfering with the environment since the human civilization evolved. With the increased human tendency of exploitation of natural resources for economic development, the environment is facing serious threats to its conservation.

According to UNESCO and UNEP (United Nations Environment Program)"Environment education is a sustained process in which the individuals gain awareness of their environment and acquire the knowledge and skills to enable them to act individually as well as collectively to solve environment problems". (Kurukshetra, 2004)

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## **Need for the Study**

The results of the pretest and post test of the intervention are presented in this study to create awareness about the impact and influence of the intervention programme on school children.

## **Review of Literature**

Environmental Awareness Among Secondary School Students a study conducted by Tejpreet Kaur Kang and Asha Chawla (2011). Environment has become the concern for all; the academicians, intellectuals, scientists, policy makers and government across the continents. The UN World Conference on the Environment in Stockholm in 1972, the Earth Summit held in Rio de Janeiro in 1992, the Global Forum, 1992 and the activities organized by the International NGO Forum show that environment is on the agenda of the international community. People have become more concerned about the environment. The environmental movement has focused attention on the quality of the air we breathe and the water we drink, on how new dam construction harms wildlife and how strip mining devastates the landscape and causes floods. We are beginning to realize that virtually all aspects of the world around us can have profound and potentially negative effects on our health and well-being. The relationship between environment and human kind is indeed deep and has been recognized from the Vedic period. Therefore, awareness and education of environment is the paramount concern of all the citizens of society. Environment protection starts by creating awareness among the people so that it becomes part of their lifestyle. The key to achieving this goal lies in environmental education and its related programmes. The objective of environmental education includes awareness, knowledge, attitudes, skills and participation of people in protecting the environment. Present study was conducted on 60 senior secondary students (30 boys and 30 girls) belonging to the age group of 15 to 17 years. Environment Awareness Ability measure by Jha was used to assess their environment awareness. Majority of the students were found to be having average to high level of environment awareness. Significant gender differences existed in environment awareness.

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**A Study of Environmental Awareness Among Higher Secondary Students And Some Educational Factors Affecting It - a study conducted by Prashant Kumar Astalin (November 2011).**

In this study investigator has tried to find the environmental awareness among higher secondary students and some educational factors affecting it. Total 608 students were selected from different board by using cluster random sampling technique having 280 male and 328 female students. For collecting data the tool "Paryavaran Jagrukata Prashnavali" constructed by investigator was used. Post Hoc Tests, F-test and t-ratio test had been used for analysis of data. Main findings of this study are the students of 11th and 12th standard were identical as for as their environmental awareness was concerned. Science stream students had more environmental awareness in comparison to arts stream students. The CBSE students had more environmental awareness in comparison to UP Board students. Parent's group of students belonging to literate, undergraduate, post graduate and research had more environmental awareness in comparison to parent's group of students belonging to high school and intermediate. Finally the male students had also more environmental awareness in comparison to female students.

**Environmental Knowledge and Attitude among Students in Sabah - a study conducted by Rosta Harun World Applied Sciences Journal (2011).**

Environmental awareness among students is highly influenced by their background, knowledge, attitude and sensitivity towards the environment. The objectives of this study are to identify level of knowledge on environmental literacy and attitude towards environmental issues that are occurring in Malaysia presently among students in Sabah, Malaysia. Multi-stage stratified sampling was used to select the samples. Data was collected using self-administered questionnaire which was developed by expert panel which consisted of lecturers and teachers through two sessions of focus group discussions (FGD). The items developed for the questionnaires took into consideration the environmental problems which have existed locally as well as cultural sensitivities of local community. Pilot test among 50 form four secondary school students show moderate level of internal consistency of knowledge (Cronbach Alpha -0.68) and

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attitude (Cronbach alpha 0.72) domains. 1106 (95%) of 1200 sample responded the study. The result show that in general, students in Sabah particularly from Form 4 level have high level of environmental knowledge except for several items which measure the current environmental issues in Malaysia such as Carbon dioxide and climate change. Their attitudes are influenced by the level of knowledge that they have concerning the environment.

### **Objectives of the Present Study**

1. To compare the pretest and posttest knowledge of the high school children about environment, its pollution and conservation.
2. To compare the pretest and posttest attitude of the high school children about environment, its pollution and conservation.
3. To compare the pretest and posttest practices of the high school children about environment, its pollution and conservation.
4. To compare the knowledge, attitude and practices of the high school children of the five schools about environment, its pollution and conservation.

### **Hypotheses**

1. There is no difference between the pre test and post test knowledge of the respondents about environment, its pollution and conservation.
2. There is no difference in the pre test and post test attitude of the respondents about environment, its pollution and conservation.
3. There is no difference in the pre test and post test practices of the respondents about environment, its pollution and conservation.
4. There is no difference in the pre and post test knowledge, attitude and practices of the respondents of the five schools.

### **Scope of the Study**

The findings of the present study will be an eye opener to other rural government schools who, on the same lines can promote the knowledge of an eco-friendly environment among the students. It will also inculcate a positive attitude and better practices of the eco-friendly environment.

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## **Methodology**

The study was carried out in the following phases.

### **Phase - I**

To conduct a survey on five Government Aided High Schools from each of the five different villages, randomly selected in Pavagada Taluk, Tumkur Dist. Karnataka, India, which are listed below.

- 1) Mugdalabetta (Fig.1)
- 2) K.T. Halli (Fig.2)
- 3) Gujjanadu (Fig.3)
- 4) Mangalawada (Fig.4)
- 5) C.K. Pura (Fig.5)



Fig.1 - Rastra Pragathi High School, Mugdalbetta.





Fig.2 – Sri Rama Rural High School, K.T. Halli.



Fig. 3 - Netra Vidya Peeta High School, Gujjanadu



Fig.4 - Thirumala Raghavendra High School, Mangalawada.



Fig. 5 - Sri Siddeshwara Swamy High School, C.K. Pura.

## Phase - II

### Identification of the sample:

Adolescent boys & girls studying in 9<sup>th</sup> standard in the 5 Government Aided High Schools in Pavagada Taluk numbering 300 were selected using the purposive random sampling.

## Phase - III

### Development of the Tool

A Questionnaire on adolescents' knowledge about the environment, its pollution and conservation was developed both in English and Kannada, since Kannada is the medium of instruction followed in the rural schools. It consisted of the basic information about the

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respondents, followed by five sections in which objective type questions were asked. A total of 119 questions were framed for the questionnaire and 20 statements each regarding attitude and practices towards environment were distributed to the respondents.

**Part-A** Consisted of statements true/false, multiple choices and matching the items under the following heads:

1. Eco- system and environment
2. Air
3. Water
4. Land
5. Energy, environment and resource conservation management.

**Part-B** consisted of one section on picture perception.

A total of 119 questions were framed for the questionnaire.

#### **Phase - IV**

#### **Pilot Study**

A pilot study was conducted on hundred 9<sup>th</sup> standard High school students, selected randomly, 20 each from the 5 schools.

#### **Phase - V**

**Pretest:** The respondents were administered the developed tool to elicit information about their existing knowledge, attitude and practices followed to maintain an eco-friendly environment.

#### **Phase -VI**

**Development of the Module:** After assessing the existing knowledge, attitude and practices followed by the respondents, the intervention module was developed to educate adolescents in gaining more knowledge, to develop positive attitude and better practices regarding the eco-friendly environment.

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## Phase -VII

### Intervention Phase

The developed module of the intervention program was implemented for an academic year in the schools using appropriate audio-visual aids and teaching strategies.



Creating Environmental awareness regarding air pollution at K.T. Halli High School.

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Activity conducted at K T Halli School regarding Eco-system and Environment.



Activity conducted at K T Halli School regarding Eco-system and Environment.





Creating Environmental Awareness Regarding Solar Energy and Water Conservation at C K Pura School.



Creating Environmental awareness through Tree planting at Mugadalabetta School.



Creating Environmental awareness for school children and Teachers of five schools by conducting exhibition at K.T. Halli School with charts and miniature models prepared by school children on pollution and conservation.

### **Phase-VIII**

**Posttest:** The developed tool was re-administered to the respondents to assess their knowledge, attitude and practices followed in maintain an eco-friendly environment. A pre and post test data analysis was made to study the influence of the intervention program in enhancing the knowledge, positive attitude and better practices of eco-friendly environment among the adolescents. The purpose of the intervention program was reassessed using the same tool, keeping an interval of one month between intervention and the reassessment.

**Comparison between Pre and Post Mean Scores under Different Dimensions of Environment (Experimental Group), Mugadalabetta Village**

Place	Dimensions	Pre test (Mean ± SD)	Post test (Mean ± SD)	Significance of t value
<b>MugadalaBetta (n = 11)</b>	<b>Eco-System &amp; Environment</b>	9.36 ± 1.91	14.09 ± 1.22	6.3910**
	<b>Air</b>	7.90 ± 2.34	13.63 ± 1.28	8.3154**
	<b>Water</b>	5.45 ± 1.75	13.63 ± 0.92	19.3649**
	<b>Land</b>	5.63 ± 2.24	13.54 ± 1.12	12.3782**
	<b>Energy &amp; Resource Conservation</b>	10.54 ± 2.73	23.54 ± 2.16	17.3459**
	<b>Picture Perception</b>	9.90 ± 1.70	23.00 ± 1.34	20.0465**
	<b>Overall</b>	48.81 ± 5.07	101.45 ± 4.43	35.7435**
	<b>Attitude</b>	19.00 ± 4.73	34.72 ± 0.90	11.0661**
	<b>Practice</b>	19.09 ± 4.67	29.81 ± 2.71	7.4809**

\*\* Significant at 1% level

### **Interpretation**

The analysis shows high significant difference in mean scores with regard to pretest and posttest analysis under five dimensions- Eco-system and environment, air, water, land, energy and resource conservation and picture perception; attitude and practices towards the eco-friendly environment. The overall mean scores were significantly much higher in the post test analysis than the pre- test, showing that the intervention program was extremely useful and educative to the experimental group. The standard deviation of all the dimensions and attitude and practices were significantly lesser in the post test, showing that the post test values were more homogenous, since they showed less variability than the pre test scores.

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The **t** values were significant at 1% level for all the five dimensions as well as attitude and practices towards the eco-friendly environment. Especially with regard to water, energy and resource conservation, picture perception and attitude towards eco-friendly environment, the **t** values were found to be much higher than the other dimensions and practices.

**Comparison between Pre and Post Mean Scores under Different Dimensions of Environment (Experimental Group), K T Halli Village**

Place	Dimensions	Pre test (Mean ± SD)	Post test (Mean ± SD)	Significance of t value
<b>K. T. Halli (n = 26)</b>	<b>Eco-System &amp; Environment</b>	6.57 ± 1.67	13.57 ± 0.94	19.0245**
	<b>Air</b>	9.46 ± 2.35	13.03 ± 1.07	6.6098**
	<b>Water</b>	4.73 ± 1.58	12.76 ± 1.17	19.8160**
	<b>Land</b>	7.76 ± 2.53	13.80 ± 1.16	11.2592**
	<b>Energy &amp; Resource Conservation</b>	9.23 ± 2.15	26.23 ± 2.31	26.7766**
	<b>Picture Perception</b>	11.42 ± 1.87	22.92 ± 1.49	20.3049**
	<b>Overall</b>	49.19 ± 5.86	102.34 ± 3.35	36.4615**
	<b>Attitude</b>	22.46 ± 3.08	34.57 ± 1.62	19.3561**
	<b>Practice</b>	20.34 ± 4.86	30.84 ± 2.76	13.7598**

\*\* Significant at 1% level

**Interpretation**

The analysis shows high significant difference in mean scores with regard to pretest and posttest analysis under five dimensions- Eco-system and environment, air, water, land, energy and resource conservation and picture perception; attitude and practices towards the eco-friendly environment. The overall mean scores were significantly much higher in the post test analysis than the pre- test, showing that the intervention program was extremely useful and educative to

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the experimental group. The standard deviation of all the dimensions except energy and resource conservation and not so significantly lesser with regard to water and land in the post test showing that except for energy and resource conservation, the posttest values were more homogenous since they showed less variability than the pretest scores.

The **t** values were significant at 1% level for all the five dimensions as well as attitude and practices towards the eco-friendly environment. Especially with regard to eco-system and environment, water, energy and resource conservation, picture perception and attitude towards eco-friendly environment, the **t** values were found to be much higher than the other dimensions and practices.

**Comparison between Pre and Post Mean Scores under Different Dimensions of Environment (Experimental Group), Gujjanadu Village**

<b>Place</b>	<b>Dimensions</b>	<b>Pre test (Mean ± SD)</b>	<b>Post test (Mean ± SD)</b>	<b>Significance of t value</b>
<b>Gujjanadu (n = 28)</b>	<b>Eco-System &amp; Environment</b>	8.03 ± 2.02	13.60 ± 1.02	11.1471**
	<b>Air</b>	7.60 ± 2.54	13.39 ± 1.10	11.1184**
	<b>Water</b>	5.92 ± 2.60	13.89 ± 0.98	15.6032**
	<b>Land</b>	6.03 ± 2.64	13.67 ± 1.12	12.7788**
	<b>Energy &amp; Resource Conservation</b>	9.50 ± 4.46	22.32 ± 2.84	29.1650**
	<b>Picture Perception</b>	10.00 ± 2.44	22.67 ± 1.18	31.2920**
	<b>Overall</b>	47.10 ± 9.51	99.57 ± 3.41	32.2643**
	<b>Attitude Practice</b>	22.42 ± 2.89 22.35 ± 4.06	33.89 ± 1.81 31.28 ± 3.14	19.0790** 15.2291**

\*\* Significant at 1% level

## Interpretation

The analysis shows high significant difference in mean scores with regard to pre test and post test analysis under five dimensions- Eco-system and environment, air, water, land, energy and resource conservation and picture perception; attitude and practices towards the eco-friendly environment. The overall mean scores were significantly much higher in the post test analysis than the pre- test, showing that the intervention program was extremely useful and educative to the experimental group. The standard deviation of all the dimensions and attitude and practices were significantly lesser in the post test, showing that the post test values were more homogenous, since they showed less variability than the pre test scores.

The **t** values were significant at 1% level for all the five dimensions as well as attitude and practices towards the eco-friendly environment. Except for eco-system and environment, air and land, the **t** values were found to be much higher in the other dimensions, attitude and practices.

### Comparison between Pre and Post Mean Scores under Different Dimensions of Environment (Experimental Group), Mangalawada Village

Place	Dimensions	Pre test (Mean $\pm$ SD)	Post test (Mean $\pm$ SD)	Significance of t value
Managalwada (n = 40)	Eco-System & Environment	8.50 $\pm$ 2.55	13.60 $\pm$ 1.05	14.1170**
	Air	8.70 $\pm$ 2.63	13.55 $\pm$ 1.15	14.9995**
	Water	7.32 $\pm$ 3.02	13.15 $\pm$ 1.43	17.3532**
	Land	6.72 $\pm$ 2.35	13.12 $\pm$ 1.15	24.5986**
	Energy & Resource Conservation	11.02 $\pm$ 4.52	21.47 $\pm$ 4.03	33.7115**

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	<b>Picture Perception</b>	11.47 ± 2.31	19.35 ± 2.37	32.7181**
	<b>Overall</b>	53.75 ± 11.83	94.25 ± 6.57	39.4039**
	<b>Attitude</b>	24.17 ± 3.38	66.72 ± 9.66	42.2278**
	<b>Practice</b>	23.15 ± 4.04	30.70 ± 3.42	18.3565**

\*\* Significant at 1% level

### Interpretation

The analysis shows high significant difference in mean scores with regard to pre test and post test analysis under five dimensions- Eco-system and environment, air, water, land, energy and resource conservation and picture perception; attitude and practices towards the eco-friendly environment. The overall mean scores were significantly much higher in the post test analysis than the pre- test, showing that the intervention program was extremely useful and educative to the experimental group. The standard deviation of the dimensions eco-system and environment, air, water, land and energy and resource conservation were significantly lesser in the post test.

The **t** values were significant at 1% level for all the five dimensions as well as attitude and practices towards the eco-friendly environment. Especially with regard to land, energy and resource conservation, picture perception and attitude towards eco-friendly environment, the **t** values were found to be much higher than the other dimensions and practices.

### Comparison between Pre and Post Mean Scores under Different Dimensions of Environment (Experimental Group), C K Pura Village

Place	Dimensions	Pre test (Mean ± SD)	Post test (Mean ± SD)	Significance of t value
<b>C. K. Pura (n = 47)</b>	<b>Eco-System &amp; Environment</b>	8.38 ± 2.06	12.44 ± 1.20	18.2835**
	<b>Air</b>	8.10 ± 2.67	12.85 ± 1.38	16.4011**
	<b>Water</b>	5.31 ± 2.16	12.89 ± 1.33	32.4923**
	<b>Land</b>	6.19 ± 3.08	12.78 ± 1.14	17.0034**

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<b>Energy &amp; Resource Conservation</b>	10.03 ± 3.13	13.10 ± 2.16	13.1641**
<b>Picture Perception</b>	10.78 ± 2.88	19.53 ± 2.48	21.9566**
<b>Overall</b>	49.04 ± 6.90	80.78 ± 5.14	44.3771**
<b>Attitude</b>	25.31 ± 3.42	33.29 ± 1.14	17.1311**
<b>Practice</b>	23.38 ± 4.58	64.23 ± 12.51	35.0675**

\*\* Significant at 1% level

### Interpretation

The analysis shows high significant difference in mean scores with regard to pre test and post test analysis under five dimensions- Eco-system and environment, air, water, land, energy and resource conservation and picture perception; attitude and practices towards the eco-friendly environment. The overall mean scores were significantly much higher in the post test analysis than the pretest, showing that the intervention program was extremely useful and educative to the experimental group. The standard deviations of all the dimensions except practice towards eco-friendly environment were significantly lesser in the posttest.

The **t** values were significant at 1% level for all the five dimensions as well as attitude and practices towards the eco-friendly environment. Especially with regard to water, picture perception and practices towards eco-friendly environment, the **t** values were found to be much higher than the other dimensions and attitude.

Seeing to the interpretation of the comparison between pre and post mean scores, standard deviation and **t** value under the different dimensions of environment pollution, among the five schools taken for the study, first, second and third hypotheses stating that: There is no difference between the pretest and posttest knowledge of the respondents about environment, its pollution and conservation; There is no difference in the pretest and posttest attitude of the respondents about environment, its pollution and conservation; There is no difference in the pretest and posttest practices of the respondents about environment, its pollution and

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conservation have been disproved. The fourth hypothesis that there is difference in the pre and post test knowledge, attitude and practices of the respondents of the five schools has also been disproved. In fact, the findings of the study show a lot of difference between the mean scores of pre and posttests, the posttest mean scores being much higher than the pre test mean scores.

## **Conclusion**

Very interesting results have been observed from the present study under taken for 9<sup>th</sup> standard children from the five schools in Pavagada Taluk.

The mean scores and **t** value of the pre and post tests under different dimensions of the environment regarding the experimental group showed high significant difference in mean scores with regard to pretest and posttest analysis. Under the five dimensions - eco-system and environment, air, water, land, energy and resource conservation and picture perception, and also attitude and practices towards the eco-friendly environment.

The overall mean scores were significantly much higher in the post test analysis than the pretest, showing that the intervention program was extremely useful and educative to the experimental group.

The standard deviation of all most all the dimensions and attitude and practices were significantly lesser in the post test, showing that the posttest values were more homogenous, since they showed less variability than the pre test scores.

The **t** values were significant at 1% level for all the five dimensions as well as attitude and practices in all the five schools towards the eco-friendly environment.

The above study gives a clear picture of the improvement regarding knowledge, attitude and practices about the eco-friendly environment and has uncalculated better knowledge, positive attitudes and better practices among the children.

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