

# Developing Responsible Environmental Behaviour in Indian Adolescents: An Experimental Study

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## ABSTRACT

The present study aimed at developing Responsible Environmental Behaviour in Indian adolescents. A sample of 260 students of class IX studying in Private Schools of Patiala affiliated to CBSE, constituted the population for the study. The objective of the study was to find whether groups taught through Active Learning Programme and Traditional Teaching Method differ in mean gain scores on Responsible Environmental Behaviour by investigator for giving treatment to one of the two groups (Active Learning Programme group) and Responsible Environmental Behaviour scale developed and standardized by the investigator herself to collect the scores on Responsible Environmental Behaviour. The findings reveal that there exists a significant difference between group taught through Active Learning Programme and group taught through Traditional Teaching Method in the mean gain scores on the variable of Responsible Environmental Behaviour.

**Keywords:** Active learning programme, responsible environmental behaviour, traditional teaching

Much of our conventional education is learning “about” nature. We study nature as something separate from us and as an object which is useful to us. When human beings consider themselves to be the masters of earth and have dominion over it, then they are more likely to abuse it and exploit it. So there is need to learn that everything we receive from nature is a gift. We receive the gifts given to us by our friends with thanks and gratitude. We will never harm or exploit or damage or denigrate someone who is our friend. Nature is not there to be plundered or exploited rather it is there to be cherished and celebrated. Nature identification is possible only when we are able to let go off our separation. To learn from nature we need to be in nature. Imagine children cleaning up rivers and beaches, saving trees, starting recycling programs and establishing a nursery. These all programs will expose the students to actual world they live. Main focus of Environmental Education is to acquaint the students with environmental related issues and problems. They must also be able to look at

the environmental problems and to evaluate, draw inferences and equip themselves to resolve them.

## Present position of Environmental Education in the Schools

The most serious long-term threat facing the world is the danger that human actions are producing irreversible harmful changes to the environmental conditions that support life on Earth.

In this context, the Hon’ble Supreme Court of India has directed all educational agencies in the country to make Environmental Education as a compulsory component of the system from 2005-2006 from class I to XII. Before this, national board like CBSE has introduced it as optional subject in their curriculum. Some state board like Maharashtra board has made Environmental Education compulsory.

Children are just mugging up another subject, the Environmental Education, the prescribed curriculum won’t help a student in getting a mound of rubbish outside a house or school cleared.

Students are being taught mere facts and figures. We have to make our children realize that they are part of the problem and therefore they have to be part of solution also. So it is important for the teacher to actively pursue methods that bring about behaviour change or positive behaviour development in learners. Behaviour change or positive behaviour development are personal endeavours. Selection of methods therefore should aim at making the education learner – centred.

### Active Learning

*“We will conserve only what we love, we will love only what we understand, we will understand only what we taught”*

— **Dioum (1998)**

Environmental Education has a mission to achieve. It aims at creating a society of motivated citizens committed to conservation, preservation and protection of the environment and striving towards a life in perfect harmony with nature. To achieve this mission, certain essential steps have to be taken. First of all, young learners should develop skills for dealing effectively with problems and to acquire leadership qualities through participation in specially designed activities.

Active Learning strategies in Environmental Education includes:

- ♦ Class Discussion
- ♦ Small Group Projects
- ♦ Games
- ♦ Information gathering and dissemination
- ♦ Visit to sites/field trips
- ♦ Demonstration in school
- ♦ Debate and discussion on topic relevant to Environmental problems.
- ♦ Outdoor studies
- ♦ Guest lecturer
- ♦ Practical work
- ♦ Role Plays, Simulation, games and dramatization.
- ♦ Filling in Puzzles
- ♦ Painting and Modeling

- ♦ Composing and Singing or reciting on Environment Education
- ♦ Writing Essays, Case histories etc.
- ♦ Carrying out projects e.g. nursery establishments and management making demonstration plots, making scrap books, monitoring local environment for pollution, deforestation, soil erosion etc.
- ♦ Story telling
- ♦ Participation in Community activities e.g. Public health Education, Garbage Collection, Bush Cleaning, Soil and Water Conservation activities, Forestation/Tree Planting, Conservation Campaigns etc.

One of the objectives of the Tbilisi Conference declaration of 1977 was to operationalise Responsible Environmental Behaviour. A good attitude will help people to acquire sets of values and feelings of concern for their environment and motivate them to actively participate in the improvement and protection of the environment (Hungerford and Volk, 1990).

### Responsible Environmental Behaviour

*“The unleashed power of the atom has changed everything except our ways of thinking.”*

— **Einstein (1946)**

Environmental crisis is referred as crisis of maladaptive behaviour

All of this led to realization that the current behaviour of people towards their environment needs to change, implying that people need to learn how to behave in an environmentally responsible way. (Linke, 1998)

Environmentally responsible behaviour is a measure of how far a person is prepared to take an active part in protecting the environment. It is one of the three components of environmental consciousness (the other two being the understanding of environmental issues and attitude towards the environment) that educators, environmentalists and curriculum agencies (Greenall-Gough, 1990) are seeking to promote.

To a large extent it is a reflection of a person’s understanding of environmental issues and his

or her views towards them. Environmentally responsible behaviour is a composite attribute involving both personal habits and collective action.

### **Studies Related to Responsible Environmental Behaviour**

Sia, Hungerford and Tomera (1986) in their research indicated that the classroom instruction has limited impact at improving the Responsible Environmental Behaviour in 5th graders. We can enhance it through extended outdoor experiences.

Sivek and Hungerford (1989) attempted to assess eight selected variables affecting the prediction of Responsible Environmental Behaviour:

- ♦ Level of environmental sensitivity.
- ♦ Perceived individual Locus of Control.
- ♦ Perceived group Locus of Control.
- ♦ Perceived knowledge of environmental action strategies.
- ♦ Perceived skill in using environmental actions strategies.
- ♦ Beliefs about/attitudes toward pollution.
- ♦ Beliefs about/attitudes towards technology.
- ♦ Psychological sex role classification.

They found that perceived skill in environmental action strategies was an extremely strong predictor of Responsible Environmental Behaviour. Locus of Control, both individual and group, was also significant component. The third significant factor was regarding environmental sensitivity. They determined that major precursors for sensitivity include variables associated with the out of doors and related activities.

Whiston (1992) presented research on the relationship between college students attitude and behaviour. It reviews models of environmental paradigms and relates them to an assessment of college students' attitudes and action with respect to responsible environmental behavior. Attitudes such as satisfaction, optimism, commitment, urgency and increase in concern are tested against a student's level of reported action with respect to environmental issues. It's particular significance is the way in which the attitudes may easily be suspended or contradicted in terms of behaviour on self reported actions.

Ramsey (1993) used issue investigation and action training (IIAT) with eighth graders. His findings were similar to 7<sup>th</sup> graders, that IIAT promoted the specific knowledge, skills, and beliefs critical to Responsible Environmental Behaviour, one difference was the indication that subject's Locus of Control was significantly promoted, although earlier studies had shown the group Locus of Control to be greater than individual Locus of Control.

Hammit and Freimund (1994) studied the changes in Responsible Environmental Behaviour for students in the National Outdoor leadership school (NOLS), a prominent outdoor education organization. Results revealed that students' reported behaviour was significantly more environmentally responsible after NOLS. Students responded more positively after NOLS to construct of a theoretical predictive model for Responsible Environmental Behaviour.

Vaske and Kobrin (2001) believe that place attachment facilitates the development of Responsible Environmental Behaviour. They operationalise place attachment as place dependence which refers to a functional attachment to a specific place and place identity which refers to an emotional attachment to that specific place. According to them a person will engage in Responsible Environmental Behaviour towards a place (natural setting) if they have emotionally meaningful ties to that place. Environmental Education (EE) programmes should therefore be designed in such a way that they help learner form an emotional attachment to their immediate environment and the broader or global environment.

Adams (2003) evaluated the effectiveness of the Globe environment Programme in promoting environmentally responsible behaviour in the learners in one South African school. The Globe environment Programme was proved to be supportive of not only promoting environmentally concerned attitude but also environmentally responsible behavior. It was an Environmental Education and science programme that has been implemented in more than 80 countries. It follows the guidelines identified at Tbilisi conference held in 1977.

Kaur (2007) conducted a study of environmental knowledge, sensitivity, attitudes and action strategies in relation to locus of control of Prospective and In-service teachers on 400 Prospective and in-service

teachers from different schools and colleges of Education of Chandigarh. She found that In-service teachers exhibited better total environmental knowledge, better total environmental sensitivity and better total environmental action strategies than prospective teachers.

She also found that there was a significant interaction between teacher type and locus of control with respect to total environmental knowledge, total environmental sensitivity and total environmental action strategies.

Lake, Flanagan and Osgood (2010) presented a descriptive analysis of trends in the environmental attitudes, beliefs and behaviour of high school seniors from 1976 to 2005. Across a range of indicators, environmental concerns of adolescents show increases during the early 1990s and declines across the remainder of the three decades. Declining trends in reports of personal responsibility for the environment, conservation behaviors, and the belief that resources are scarce are particularly noteworthy. Across all years, findings reveal that youth tended to assign responsibility for the environment to the government and consumers rather than accepting personal responsibility. Recent declines in environmental concerns for this nationally representative sample of youth signal the need for a renewed focus on young people's views and call for better environmental education and governmental leadership.

### **Emergence of the problem**

Reviews related to different Environmental education programmes including activity oriented instruction in Environmental education helps in forming concepts concerning environmental subjects (Bryant and Hungerford, 1979), conservation programs which develop positive attitude towards environment (Ryan 1991), many active learning strategies like problem solving, cooperative students projects, role playing etc., which cultivates critical thinking. Studies related to Active Learning Programme show that issue investigation and action training (IIAT) providing training directed at environmental issue analysis, investigation and resolution promoted Responsible Environmental Behaviour. (Ramsey & Hungerford, 1989) and active participant involvement in Active Learning Programme was also determined to be positively

related to improving environmental behavior (Zelezny, 1999).

According to Lake, Flanagan and Osgood (2010) since the Environmental Movement began, adolescents' views have been largely ignored in studies of public opinion. There are two main reasons for paying close attention to trends in this age group's views. First, according to the theory of generational replacement the changes in adolescents' attitudes are important markers of long-term social change. Second, young people's environmental concerns also deserve attention because they act as active agents in protecting the environment. By the age of 15 and 16, adolescents are in a stage called Moralism: they have an increasing awareness of themselves and their decisions are based on a combination of cognitive and affective components. So the researcher decided to study the effect of Active Learning Programme on Responsible Environmental Behaviour on adolescents studying in secondary schools.

## **METHODOLOGY**

### **Variables**

#### **Independent variable**

Teaching strategy was independent or treatment variable. Treatment variable was performed in two ways:

- (i) Active Learning Programme and
- (ii) Traditional Teaching Method

#### **Dependent Variable**

Dependent Variables were Responsible Environmental Behaviour and its dimensions, namely:

- ◆ Civic action
- ◆ Educational action
- ◆ Financial action
- ◆ Legal action
- ◆ Physical action
- ◆ Persuasive action

### **Sample**

Students of class IX studying in Private Schools of Patiala affiliated to CBSE, formed population

for the study. The data was collected from IX class students studying in schools situated in Patiala. A sample of 260 students of class IX was raised. The technique employed was multistage randomization of clusters at school and section levels. There were 18 schools and out of these 18 schools, four schools were selected randomly. Out of each of these schools thus selected, two sections were selected randomly. Further each section was assigned to one of the two Teaching Strategies namely Active Learning Programme and Traditional Teaching Method using randomization. Thus two groups, namely A1 group taught through Active Learning Programme and A2 group taught through Traditional Teaching Method were formed.

### Hypothesis

- ♦ There exists no significant difference in the mean gain scores of group taught through Active Learning Programme and group taught through Traditional Teaching Method on Responsible Environmental Behaviour, and its dimensions namely Civic action, Educational action, Financial action, Legal action, Physical action and Persuasive action.

### Tools Used

For the present study the following tools were employed to collect relevant data:

- ♦ Active Learning Programme developed by investigator for giving treatment to Active Learning Programme group.
- ♦ Responsible Environmental Behaviour scale developed and standardized by the investigator herself to collect the scores on Responsible Environmental Behaviour.

### Description of tools

#### Active Learning Programme

Active Learning Programme included 45 activities like Class Discussion, Small Group Project, Games, Information gathering and dissemination, Visit to sites/field trips, Demonstration in school, Debate and discussion on the topic relevant to Environmental problems, Outdoor studies, Guest lecture, Practical work, Role play, Filling in Puzzles, Painting, Singing or reciting on Environment Education, Writing

essays, Carrying out projects e.g. composting plants, tree plantation, making scrap books, Story telling, Participation in Community activities e.g. Survey on the use of natural resources, Litter Collection, Campus maintenance, Soil and water Conservation activities, Conservation Campaigns and Visit to sites.

#### Responsible Environmental Behaviour scale:

The Responsible Environmental Behaviour scale was developed by the investigator herself with the objective of measuring the Responsible Environmental Behaviour of adolescents in Indian situations. After careful exploration and survey of literature, six dimensions, namely, Civic action, Educational action, Financial action, Legal action, Physical action and Persuasive action as given by Smith-Sebasto (1995) were included in the present scale.

#### Procedure

The following procedure was adopted for conducting the study:

**Phase I** : Pre-Testing

**Phase II** : Experimental Phase

**Phase III** : Post Testing

#### Phase I (Pre Testing)

A sample of 260 students of class IX was raised from four schools. In this phase the initial scores were obtained pertaining to Responsible Environmental Behaviour by administering Responsible Environmental Behaviour scale on whole sample. The sample was divided into two groups, namely, Active Learning Programme group and Traditional Teaching Method group as already has been explained while describing sample.

#### Phase II (Experimental Phase – The treatment)

Active Learning Programme group was taught through Active Learning Programme for 45 days for one hour daily. The Traditional Teaching Method group was taught the same lessons through Traditional Teaching strategy by investigator herself involving Lecture method, weekly and Monthly test which is being practiced in the schools these days for the same duration as the experimental group.

**Phase-III (Post-Testing)**

After completion of the instructional treatment, the final scores were obtained, pertaining to Responsible Environmental Behaviour by administering the same Responsible Environmental Behaviour scale as post test to the students of experimental and control group.

**RESULTS AND DISCUSSION**

**Descriptive Statistics**

Descriptive statistics such as mean, median, mode, standard deviation, skewness and kurtosis were worked out in order to ascertain the trend and nature of distribution of scores on Responsible Environmental Behaviour along with its dimensions viz. Civic action, Educational action, Financial action, Legal action, Physical action & Persuasive action, Locus of Control and Achievement Motivation for the total sample, for the group taught through Active Learning Programme and for the group taught through Traditional Teaching Method. These values are entered in Table 1 and 2.

**Interpretation and Discussion based on Table 1**

Table 1 shows that the values of Mean, Median and mode are almost equal for all the variables. So, it can be inferred that dependent variables Responsible Environmental Behaviour and its dimensions namely Civic action, Educational action, Financial action, Legal action, Physical action & Persuasive

action and independent variables of Locus of Control and Achievement Motivation are nearly normally distributed. The values of the Skewness for all the variables except the Financial action, Legal action and Physical action are slightly negatively skewed (the values of skewness varied from to -0.48 to -0.05) and for Financial action, Legal action and Physical action are slightly positively skewed (the values of skewness are 0.24, 0.12 and 0.21 respectively). The distortions in obtained values of skweness from normal value (0.00) were negligible. Therefore the distribution can be treated as normal.

The values of Kurtosis show that the distributions of the scores on all the variables are platykurtic as kurtosis is more than 0.263 in case of all the variables. It did not indicate marked departure from normal because the values of kurtosis for all the variables were close to 0.263, which is the value of kurtosis for normal distribution. Hence the distribution can be treated as normal.

**Interpretation and Discussion based on Table 2**

Table 2 shows that the values of mean, median and mode of gain scores are almost equal with nominal variation in case of all the variables. It can be inferred that distribution of the scores on dependent variables of Responsible Environmental Behaviour and its dimensions viz. Civic action, Educational action, Financial action, Legal action, Physical action & Persuasive action and independent variables of Locus of Control and Achievement Motivation are approximately normal.

**Table 1:** Mean, Median, Mode, Standard Deviation, Skewness and Kurtosis of Gain scores on Responsible Environmental Behaviour and its dimensions namely Civic action, Educational action, Financial action, Legal action, Physical action, Persuasive action and scores on Locus of Control and Achievement Motivation of the group taught through Active Learning Programme

Variables	Mean	Median	Mode	Standard Deviation	Skewness	Kurtosis
Responsible Environmental Behaviour	132.57	131.45	129.56	18.39	-0.12	0.279
Civic action	26.16	27.02	25.13	5.57	-0.24	0.383
Educational action	22.18	23.67	24.12	7.12	-0.11	0.324
Financial action	16.24	16.78	15.89	4.36	0.24	0.286
Legal action	18.12	17.98	18.23	3.12	0.12	0.560
Physical action	36.61	35.67	37.42	32.51	0.21	0.276
Persuasive action	13.26	13.12	13.89	4.21	-0.25	0.323
Locus of Control	56.01	57.12	55.23	4.34	-0.05	0.272
Achievement Motivation	164.11	165.23	161.67	15.89	-0.48	0.301

**Inferential Statistics**

**Interpretation and Discussion of Results on the basis of Table 3**

Effect of Teaching strategies (Active Learning Programme and Traditional Teaching Method) on Responsible Environmental Behaviour and its dimensions Civic action, Educational action, Financial action, Legal action, Physical action, Persuasive action

The t-value of 9.32 for the effect of Teaching strategies namely Active Learning Programme and Traditional Teaching Method on Responsible Environmental Behaviour was found to be significant at 0.01 level as it is more than the table value of 2.59 for 258 degrees of freedom. It shows that there is a significant difference in mean gain scores of the two groups.

Hence, the hypothesis namely, “There exists no significant difference in the mean gain scores of group taught through Active Learning Programme and group taught through Traditional Teaching Method on Responsible Environmental Behaviour and its dimensions namely Civic action, Educational action, Financial action, Legal action, Physical action and Persuasive action” is rejected on the variable of Responsible Environmental Behaviour and its dimensions Civic action, Financial action, Physical action, Persuasive action and is accepted on the variable of Educational action and Legal action. So there exists a significant difference between group taught through Active Learning Programme and group taught through Traditional Teaching Method in the mean gain scores on the variable of Responsible Environmental Behaviour and its

**Table 2:** Mean, Median, Mode, Standard Deviation, Skewness and Kurtosis of Gain scores on Responsible Environmental Behaviour and its dimensions namely Civic action, Educational action, Financial action, Legal action, Physical action, Persuasive action and scores on Locus of Control and Achievement Motivation of the group taught through Traditional Teaching Method

Variables	Mean	Median	Mode	S.D	Skewness	Kurtosis
Responsible Environmental Behaviour	109.00	108.89	107.68	12.35	0.92	0.264
Civic action	24.14	24.49	24.01	5.79	0.76	0.302
Educational action	18.14	18.78	18.56	8.12	0.22	0.274
Financial action	12.74	12.78	13.02	3.52	0.61	0.278
Legal action	12.19	12.45	12.67	7.13	0.53	-0.312
Physical action	32.51	32.65	32.78	8.36	0.12	0.275
Persuasive action	9.28	9.56	10.09	3.12	0.65	0.245
Locus of Control	54.34	55.45	56.76	6.45	0.07	0.453
Achievement Motivation	161.79	162.54	160.34	14.09	-0.16	0.273

**Table 3:** t-ratio for Responsible Environmental Behaviour and its dimensions namely Civic action, Educational action, Financial action, Legal action, Physical action, Persuasive action

Variable	Active learning programme group (130)		Traditional teaching group(130)		t-ratio df = 258	Level of significance
	Mean	S.D	Mean	S.D		
Responsible Environmental Behaviour	132.57	18.39	109.00	12.35	9.32	0.01
Civic action	26.16	5.57	24.14	5.77	2.71	0.01
Educational action	22.18	7.12	18.14	8.12	1.43	Insignificance
Financial action	16.24	4.36	12.74	3.52	6.36	0.01
Legal action	18.12	3.12	12.19	7.13	1.28	Insignificant
Physical action	36.61	9.41	32.51	8.36	3.28	0.01
Persuasive action	13.26	4.21	9.28	3.12	5.12	0.01

dimensions Civic action, Financial action, Physical action, Persuasive action. There exists no significant difference between groups taught through Active Learning Programme and Traditional Teaching Method in mean gain scores on Educational action and Legal action dimension of Responsible Environmental Behaviour.

In order to determine which group is having better Responsible Environmental Behaviour, means of two groups were compared. Since mean gain scores on Responsible Environmental Behaviour of group taught through Active Learning Programme is 132.57 and group taught through Traditional Teaching Method is 109.00, it can be concluded that group taught through Active Learning Programme have significantly more Responsible Environmental Behaviour than group taught through Traditional Teaching Method.

The t-value of 2.71 for the effect of Teaching strategies namely Active Learning Programme and Traditional Teaching Method on Civic action dimension of Responsible Environmental Behaviour

was found to be significant at 0.01 level as it is more than the table value of 2.59 for 258 degrees of freedom. This implies that there is a significant difference between groups taught through Active Learning Programme and Traditional Teaching method in the mean gain scores on the Civic action dimension of Responsible Environmental Behaviour.

In order to determine which group has developed better Civic action dimension of Responsible Environmental Behaviour, means of two groups were compared. Since mean gain scores on Civic action dimension of Responsible Environmental Behaviour of group taught through Active Learning Programme is 26.16 and group taught through Traditional Teaching method is 24.14, it can be concluded that group taught through Active Learning Programme have developed significantly more Civic action dimension of Responsible Environmental Behaviour than group taught through Traditional Teaching method.

From table 3, the t-value of 1.43 for the Main effect of Teaching strategies namely Active Learning

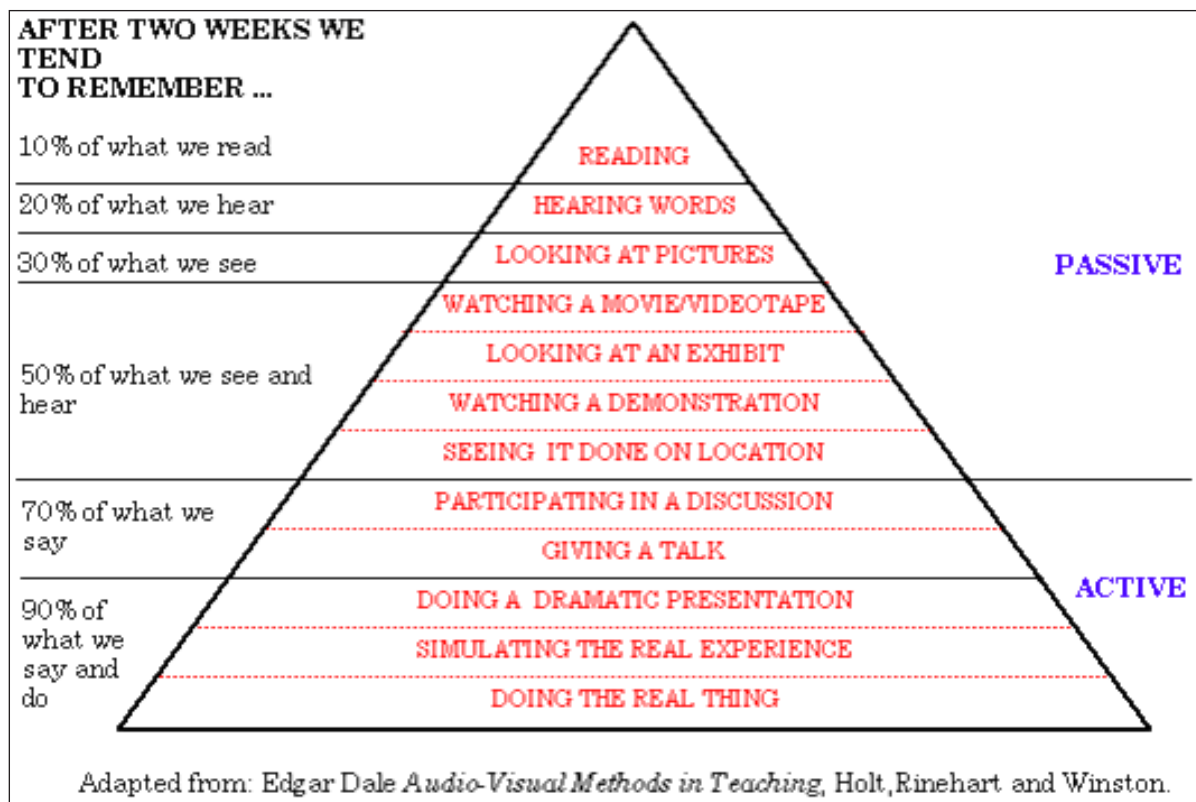


Fig. 1: The Cone of Learning



Programme and Traditional Teaching Method on Educational action was found to be insignificant at 0.05 level as it is less than the table value of 1.96 for 258 degrees of freedom. It shows that there is no significant difference in mean gain scores of the two groups on the Educational action dimension of Responsible Environmental Behaviour. This result indicates that Teaching strategies did not affect significantly the mean gain scores on Educational action.

The t-value of 6.36 for the Main effect of Teaching strategies namely Active Learning Programme and Traditional Teaching Method on the Financial action dimension of Responsible Environmental Behaviour was found to be significant at 0.01 level as it is more than the table value of 2.59 for 258 degrees of freedom. It shows that there is significant difference in mean gain scores of the two groups.

In order to determine which group has developed better on Financial action dimension of Responsible Environmental Behaviour, means of two groups were compared. Since mean gain scores on Financial action dimension of Responsible Environmental Behaviour of group taught through Active Learning Programme is 16.24 and group taught through Traditional Teaching Method is 12.74, it can be concluded that group taught through Active Learning Programme has developed significantly more than group taught through Traditional Teaching Method. This significant result may be attributed to the fact that in Active Learning Programme, opportunities were provided for the various activities like: survey of car pooling, water conservation survey and survey of use of automobiles which deal with Financial action of Responsible Environmental Behaviour. These activities helped in sensitizing the subjects regarding expenses involved in daily life and how to be economic and that in turn might have helped in promoting Financial action dimension of Responsible Environmental Behaviour. They were taught the content related to car pooling, water conservation and use of automobiles as means of saving money and becoming more economic with the help of textbooks through lecture method only. So it could be the reason that group taught through Active Learning Programme have developed significantly more Financial action than group taught through Traditional Teaching Method.

From Table 3 t-value of 1.28 for the main effect

of Teaching strategies namely Active Learning Programme and Traditional Teaching Method in mean gain scores on Legal action dimension of Responsible Environmental Behaviour was found to be insignificant at 0.05 level as it is less than the table value of 1.96 for 258 degrees of freedom. This insignificant t-ratio on the gain score indicates that two groups have not yielded significantly different mean gain scores on Legal action.

This result indicates that Teaching strategies did not affect significantly the mean gain scores on Legal action dimension of Responsible Environmental Behaviour. The above findings are justifiably true in the light of arguments given ahead. Legal action involves the knowledge about the laws enforced by the government for the protection of environment. Active Learning Programme involved only one such activity that is an extension lecture by a resource person which could help in promoting Legal action dimension of Responsible Environmental Behaviour. Similarly, in Traditional Teaching Method students were told about the laws enforced by the government for the protection of the environment by the teacher herself through lecture method. Consequently, group taught through Active Learning Programme and the group taught through Traditional Teaching Method did not differ significantly on Legal action dimension of Responsible Environmental Behaviour.

From table the t-value of 3.28 for the Main effect of Teaching strategies namely Active Learning Programme and Traditional Teaching Method in respect of gain scores on the Physical action dimension of Responsible Environmental Behaviour was found to be significant at 0.01 level as it is more than the table value of 2.59 for 258 degrees of freedom. It shows that there is a significant difference in mean gain scores of the two groups.

In order to determine which group has developed significantly better Physical action dimension of Responsible Environmental Behaviour, means of two groups were compared. Since mean gain scores of group taught through Active Learning Programme is 36.61 and group taught through Traditional Teaching Method is 32.51, it can be concluded that group taught through Active Learning Programme have significantly developed more Physical action dimension of Responsible Environmental Behaviour than group taught through Traditional Teaching Method.

The t-value of 5.12 for the effect of Teaching strategies namely Active Learning Programme and Traditional Teaching Method on Persuasive action was found to be significant at 0.01 level as it is more than the table value of 2.59 for 258 degrees of freedom. It shows that there is a significant difference in mean gain scores of two groups.

In order to determine which group is better on Persuasive action, means of two groups were compared. Since mean gain scores of group taught through Active Learning Programme is 13.26 and group taught through Traditional Teaching Method is 9.28, it can be concluded that group taught through Active Learning Programme have significantly developed more Persuasive action dimension of Responsible Environmental Behaviour than group taught through Traditional Teaching Method.

### Significance of the Study

According to the U.S. Census Bureau (2000), the world population is expanding at a mind-boggling rate. It is estimated that the population will swell to over 12 billion by 2050. That means that if the world's natural resources were evenly distributed, people in 2050 will get almost four times less than the people who lived in 1950. The world has fixed amount of natural resources-some of which are already depleted. If we intend to leave our children and grandchildren with the same standard of living we have enjoyed, we must preserve the foundation of that standard of living. We save for college education, health problems and weddings, but what about saving clean air, water, fuel sources and soil for future generations?

Environmental degradation is one of the greatest challenges that humanity is facing today. Knowledge of environmental problems will provide an informational foundation, but people will fail to act if they do not possess the desire or confidence to tackle the important issues at hand. This barrier to action establishes an educational need to develop Responsible Environmental Behaviour.

On the basis of findings of the study following educational implications may be laid down.

- ♦ Curriculum framers should make activities an integral and significant part of environmental education. While evaluating the performance

of students in the subject of environmental education due weightage should be given to these activities also. In this way it will help in the changing the views of certain parents who believe that participating in the activities is just a wastage of time.

- ♦ It has the implications for teachers, NGO's and researchers working in the area of environmental education and curriculum framers to identify activities related to these dimensions, so that Active Learning Programme may be made more enriched and beneficial in developing these dimensions may by incorporating the identified activities.

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