SUMMARY

The focus of the study was to ascertain the relative effectiveness of an Environmental Education Programme Utilizing ICT in Influencing Environmental Sensitivity, Awareness, Ethics and Attitudes among Secondary School Students. This chapter gives a brief summary of the study in retrospect which includes the rationale of the study, statement of the problem, objectives of the study, hypothesis formulated for the study, methodology, the variables in the study, the tools and techniques used procedure of the data collection and the statistical techniques used. The main findings and conclusions emerged out of the study based on the analysis, forms the major part of this chapter. The educational implications which are the contributions of the study are also included as a part along with the suggestions for further research in the field of environmental education.

INTRODUCTION

Environment is simply the world in which we live. It is not merely the atmosphere and other physical factors surrounding us, but is the complex of all factors which not only affect one organism all the time. Since late 1960’s, due to increasing industrialization and extra resources utilization, the destruction of environment in modern times has become a globally critical problem. Man is now continuously exploiting his environment and the natural resources just for the sake of his comforts and leisure. The environment damage already inflicted cannot be reversed unless there is collective thinking, will and efforts. These call for public awareness and participation for bringing about an attitudinal change and finally restricting further damage to the environment. These changes could be brought about only through a continuous, lifelong interdisciplinary Environmental Education, which can develop sensitivity, awareness, knowledge, skills, values and attitudes towards such environmental issues and help one to lead a desired quality of life.
India accepted Environment Education with recommendations of Tiwari Committee (1980) and consequently, a Department of Environment was set up in 1982 at Ahmedabad. So, Environmental Education has been accepted as the compulsory subject in India at secondary school stage and at college level. Normally in a classroom, students are taught about environmental concepts by traditional methods. Lecturing is the heart of traditional method. There is no doubt that lecturing is extremely useful for imparting large amount of factual information to large number of pupils in short duration of time. However, it is also accepted that information imparted through lecturing method is not retained by the learner for a long time. So, in order to cater the needs of the individual learner, they should be given enriched educational programme based on enhancing their environmental sensitivity, awareness, attitude and ethics. As environmental problems cannot be solved within a day or two, it requires rigorous efforts at school level. So, teacher is one of the important factors, which is bound to affect this programme.

In order to cater to the needs of individual learner, one of the important, innovative and participatory method of instruction gaining momentum is use of ICT. Information and Communication Technology can be used to provide Environmental Education to masses. Maximum information with help of technology can be provided to the learners. Imparting instruction through ICT can fill the gaps of traditional teaching because it can provide access to different sources of information. ICT provides variety in the presentation of content which help learners in concentration, better understanding, and long retention of information which is not possible otherwise. Instruction provided through computers, LCD, OHP, Power Point Presentations provides opportunity for the learner to use maximum senses to get the information. It breaks the monotony and provides variety in the teaching-learning situation. At present, ICT can be used for this purpose as it helps in drawing the attention of the learner to a
particular concept, which not only creates interest among the learners but also motivates them to learn. This learning helps the learners to become conscious about their environmental and related issues.

**RATIONALE OF THE STUDY**

The world scenario has undergone great upheaval during the last century. Technological advancement, ever increasing industrialization and the tendency of masses to settle down in urban area has resulted in environmental degradation. The repercussion of deteriorating environment conditions has been casting negative impact on the ecological conditions on the globe. Due to the activities pertaining to over exploitation of biotic and abiotic components, ecological balance is being disturbed day-by day. In the present age of technological revolution, the needs of human being are destroying the nature brutally. Insensitive and irrational exploitation of natural resources and effects of destroying the nature can be seen in the form of global warming, ozone layer depletion, increasing amount of chlorofluorocarbons, acid rain and green house effect, etc. The experts believe that within decades we will have reached the point at which the changes in ecosystems are irreversible (Leadley, 2010). Environmental problems have reached up to a level where almost everyone is conscious of them. The increasing consciousness has also given rise to a wide spread responsiveness to the idea for the need to do something about it (Chhokar, 2000). There is a great need that the society should not only be aware of the present deteriorating environmental conditions but it should also feel the responsibility to save the environment. Environmental problems are not the problems of developing countries like India but it is concerned with the whole globe. Hence, it is the need of the hour to make the whole society conscious about the ecosystem and ecological balance. Education is a powerful medium for changing our behavior. Thus, this is a crucial time to realize that environmental sensitivity and environmental friendly behavior should be cultivated among masses particularly among youth through
education. For the awareness of the society about the environment, it is essential to work at grass root level so that the entire society can work to save the environment. So, it becomes essential to educate and train children regarding the significance of healthy environment. When the pupils learn about the functioning of ecosystem and about environmental actions and strategies that contribute to their maintenance, they develop more environmentally responsible behavior on a daily basis. Now, it becomes essential that teacher should also have knowledge of environmental issues, sensitivity, awareness, attitudes and ethics towards the environment and appropriate action strategies for solving various problems related to the environment, so that similar environmental sensitivity, awareness, attitudes and ethics can be taught and developed among school students. But, research findings on the teaching of Environmental Education show that despite the fact that it is integrated in the content of different subjects, teachers do not teach it because they lack knowledge and skills in the teaching of Environmental Education (Bolstad, 2004) and few get the opportunity to see how Environmental Education is taught (Mtaita, 2005). Although Makundi (2000) supports this argument, she further attributes this situation to the approaches and methodologies used in teaching. She points out that the teaching and learning methods used emphasize knowledge gathering only. As such, students can have knowledge about environment but do not take action. Similarly, Spiropoulou et al. (2007) argue that the implementation of Environmental Education has been less effective due to the traditional teaching approaches, inflexible curricula, a lot of content to be learnt and insufficient time for an in-depth approach to the study of environmental matters and lack of skills in integrating Environmental Education into traditional subject content. In general terms, the teaching of environmental concepts should be such that the students should feel that Environmental Education is a way of teaching people to conserve and value the environment. For this, the students should be provided with visual experiences along with verbal experiences about the environment. This
creates interest among the students about the subject and also motivates them to learn. For providing such experiences to students ICT can be utilized to a large extent. At the grass root level, technology-oriented education like ICT can effectively influence the students to act. ICT can play the role of a facilitator of development, disseminator of information and an agent of change in the society. When students learn through ICT about the functioning of eco-system and about environmental action strategies that contribute to their maintenance they will develop more environmentally responsible behavior.

Keeping in view all these facts, the investigator decided to develop an Environmental Education Programme Utilizing ICT and study its effects in influencing Environmental Sensitivity, Awareness, Ethics and Attitudes among Secondary School Students.

STATEMENT OF THE PROBLEM

The selected research problem is stated here-

**EFFECTIVENESS OF AN ENVIRONMENTAL EDUCATION PROGRAMME UTILIZING ICT IN INFLUENCING ENVIRONMENTAL SENSITIVITY, AWARENESS, ETHICS AND ATTITUDES AMONG SECONDARY SCHOOL STUDENTS.**

OPERATIONAL DEFINITION OF THE KEY TERMS

- **EFFECTIVENESS**

  Effectiveness is the degree to which objectives are achieved and the extent to which targeted problems are resolved.

  In this study, effectiveness means the extent to which the Environmental Education Programme Utilizing ICT influences Environmental Sensitivity, Awareness, Ethics and Attitudes among School Students.

- **ENVIRONMENTAL EDUCATION PROGRAMME**

  Environmental Education Programme, here, involves teaching of concepts related to various issues of Environment Utilizing ICT.
INFORMATION AND COMMUNICATION TECHNOLOGY (ICT)

ICT refer to electronic means of capturing, processing, storing and disseminating information. ICT (Information and Communications Technology) in an umbrella term that includes any communication device or application, encompassing computers, Liquid Crystal Display (LCD) Projector, Over Head Projector(OHP), Power Point Presentations and internet, as well as the various services and applications associated with them for handling information (Smeets,1996).

In this study, ICT refers to a systematic use of this technology which includes computers, LCD projector, educational CDs for representation of information regarding various concepts of Environmental Education which changes learner’s perception and understanding of the content.

ENVIRONMENTAL SENSITIVITY

Environmental Sensitivity refers to an empathetic perspective towards the environment. It includes the affective domain as well as the cognitive domain. Individuals must have some cognitive knowledge of the environment to develop an intelligent concern for their natural surroundings.

In this study, Sensitivity towards the environment refers to the attributes of feeling, beliefs and emotions about environmental concerns viz. population explosion, health and hygiene, environmental pollution, wildlife & forests and concern for the conservation of environment. The Environmental Sensitivity here refers to the total score obtained by the respondents on Environmental Sensitivity Scale developed by the investigator herself.

ENVIRONMENTAL AWARENESS

It is the growth and development of understanding and consciousness towards the biophysical environment and its problems, including human interactions and effects i.e. thinking “ecologically” or in terms of an ecological consciousness.
In this study, Environmental Awareness is knowing and understanding various environmental issues like causes of pollution, conservation of wild life, natural resources, forest, animals, water, food and land—need to preserve and save them, energy conservation, reuse and recycling of waste material, local agencies responsible for its disposal and conservation of human health. The Environmental Awareness here refers to the total score obtained by the respondents on Environment Awareness Ability Measure developed by Jha (1998).

- ENVIRONMENTAL ETHICS

Environmental Ethics are concerned with the issue of responsible personal conduct with respect to environment.

In this study, Environmental Ethics, refer to human responsibility to nature and the remote future. It is ecological conscience or moral that reflects a commitment and responsibility towards the environment, including plants and animals as well as present and future generations of people. It is concerned with the issue of responsible personal conduct with respect to natural landscapes, resources, species, and non-human organism, population, global environmental issues, forests and wildlife conservation and waste generation and management. The Environmental Ethics here refers to the total score obtained by the respondents on Environmental Ethics Scale developed by Haseen Taj (2001).

- ENVIRONMENTAL ATTITUDE

Environmental Attitude is a hypothetical construct that represents an individual’s like or dislike for environment and its problems. Environmental Attitudes are positive, negative or neutral views of an individual about environmental and related issues.

In the present study, Environmental Attitudes are the individual views and feelings about population explosion, health and hygiene, environmental pollution, wildlife, forests and environmental concerns or
the way the individual tends to behave towards it, often in an evaluative way. The Environmental Attitude here refers to the total score obtained by the respondents on Environmental Attitude Scale developed by Haseen Taj (2001).

- SECONDARY SCHOOL STUDENTS

In this study, class IX students of Kendriya Vidyalaya No.1 of Ganganagar district were considered as Secondary School Students.

OBJECTIVES OF THE STUDY

The main objectives of the study were:

1. To assess the degree of Environmental Sensitivity, Awareness, Ethics and Attitudes among Secondary School Students.

2. To develop an Environmental Education Programme Utilizing Information and Communication Technology (ICT) for Secondary School Students.

3. To implement the designed Environmental Education Programme on Secondary School Students.

4. To compare the Effectiveness of Environmental Education Programme Utilizing ICT and Traditional Method of Teaching in improving Environmental Sensitivity among Secondary School Students.

5. To compare the Effectiveness of Environmental Education Programme Utilizing ICT and Traditional Method of Teaching in enhancing Environmental Awareness among Secondary School Students.

6. To compare the Effectiveness of Environmental Education Programme Utilizing ICT and Traditional Method of Teaching in cultivating Environmental Ethics among Secondary School Students.

7. To compare the Effectiveness of Environmental Education programme Utilizing ICT and Traditional Method of Teaching in developing positive Attitude towards Environment among Secondary School Students.
HYPOTHESIS OF THE STUDY

Following research hypothesis was formulated for the present study:

Environmental Education Programme Utilizing Information and Communication Technology (ICT) will be more effective than Traditional Method of Teaching in influencing Environmental Sensitivity, Awareness, Ethics and Attitudes among Secondary School Students.

DELIMITATIONS OF THE STUDY

The present study was delimited to:

- one CBSE affiliated school (Kendriya Vidyalaya) of Ganganagar district only.
- students of class IX.
- one hundred students only.
- the concepts and topics of Environmental Education only.

RESEARCH METHODOLOGY

Keeping in view the nature and need of the study, the investigator adopted the Experimental Method of Research because this method was considered to be more suitable and appropriate for the research problem. Randomized Groups, Pre-test-Post-test Experimental Design was followed by the investigator for the present study.

IDENTIFICATION OF THE VARIABLES

Three types of variables were used by the investigator for the study.

Independent Variable

Environmental Education Programme Utilizing ICT was the Independent Variable in the present study.

Dependent Variables

In this study, the Dependent Variables were Environmental Sensitivity, Environmental Awareness, Environmental Ethics and Environmental Attitudes of the Secondary School Students.
Intervening Variables

There are certain variables that might influence the dependent variable and whose effect may be confused with the effect of the independent variable. In the present study, such variables i.e. Academic Environment, Physical Environment, Grade to be Taught, Subject to be Taught, Instructor’s Behaviour, Maturation, Prior Knowledge of the Subject, Contamination Effect, Instrumentation etc. were identified and controlled experimentally.

DESIGN OF THE STUDY

In this study, the investigator adopted the Randomized Groups, Pre-test- Post-test Experimental Design. This design is used in the classroom experiments, when experimental and control groups are taken as regular class students. Randomized procedure was adopted for getting equivalent control and experimental groups.

RAJASTHAN (STATE) ↓
GANGANAGAR (DISTRICT) ↓
K.V.No.1 School, Suratgarh (SCHOOL) ↓
STUDENTS (RESPONDENTS) (100) ↓
Experimental Group (G1) (50) ↓ Pre-Test ↓ Exposed to ICT programme (For 50 days) ↓ Post-Test
Control Group (G2) (50) ↓ Pre-Test ↓ Taught through Traditional Method (For 50 days) ↓ Post-Test
A pre-test was administered to the two groups. Experimental treatment was administered to experimental group and the control group was treated with Traditional Method of Teaching i.e. Lecture Method. Then the post-test was given to the two groups. The pre-test and post-test were designed to indicate students’ Environmental Sensitivity, Awareness, Ethics and Attitudes before and after the application of the experimental treatment.

**SAMPLE**

For the present study, Purposive sampling was employed in order to select the sample. The investigator selected Ganganagar district of Rajasthan state for conducting the present study. Out of nine Tehsils of district Ganganagar, Suratgarh Tehsil was selected purposively due to convenience and easy access. The population of the present study consisted of class IX students of Secondary Schools of Ganganagar district, who were studying the syllabus/curriculum specified by Central Board of Secondary Education and using text books published by the National Council of Educational Research and Training (NCERT). An important criterion while selecting the sample school was that the school should be equipped with computer facilities and having computer laboratory with sufficient number of terminals and should have large student strength in class IX. A number of schools in Suratgarh region were shortlisted on the these basis. Most of the schools in Suratgarh region have excellent computer facilities but did not have enough student strength in class IX to carry out the study. Taking various factors into account, one school K.V.No.1, Suratgarh was finally selected for carrying out the study. The sample comprised of 100 students from all the divisions of class IX of K.V.No.1 School, Suratgarh. The students were randomly assigned to two groups, 50 students in each group i.e. experimental and control group.

**TOOLS USED IN THE STUDY**

Keeping in view the requirements of the study, following tools were used in the research.
1. **Intervention Tool**

An Environmental Education Programme Utilizing ICT was used as an intervention tool. The programme included sections on the concepts of Environmental Education.

2. **Measuring tools**

1. Environmental Sensitivity Scale developed by the Investigator herself.

The measuring tools were used as pre-test and post-test for collection of data.

**COLLECTION OF DATA**

The following procedure was adopted to collect the data.

1. Intervention and one Measuring tool i.e. Environmental Sensitivity Scale was developed by the investigator.
2. Two parallel groups i.e. control group and experimental group of 50 students each were formed by random assignment of subjects.
3. Pre-test was administered to each group before exposing the group to the treatment.
4. Environmental Education concepts were taught to control group through Traditional Method of teaching and intervention programme was employed to experimental group for a period of 50 days.
5. Post-test was administered to each group after exposing them to appropriate treatment.
STATISTICAL TECHNIQUES USED

The following statistical techniques were used to analyze the data:

1. Mean

2. Standard Deviation.

3. The effectiveness of an Environmental Education Programme Utilizing ICT and Traditional Method of Teaching in Influencing the Environmental Sensitivity, Environmental Awareness, Environmental Ethics and Environmental Attitudes among Secondary School Students was compared using ‘t-test’.

MAIN FINDINGS OF THE STUDY

Section-I AN OVERVIEW OF THE VARIABLES i.e. LEVEL OF ENVIRONMENTAL SENSITIVITY, ENVIRONMENTAL AWARENESS, ENVIRONMENTAL ETHICS AND ENVIRONMENTAL ATTITUDES OF CONTROL GROUP AND EXPERIMENTAL GROUP DEPENDING ON OBTAINED MEAN PRE-TEST SCORES

1. The mean pre-test scores on Environmental Sensitivity of control group and experimental group were 290.66 and 291.66 respectively. Therefore, it was concluded on the basis of obtained mean pre-test scores that before intervention the control group and experimental group had above average level of Environmental Sensitivity.

2. The mean pre-test scores of control and experimental group on Environmental Awareness were 31.08 and 31.52 respectively. It was depicted that the students of control and experimental group had average level of Environmental Awareness before the intervention.

3. The mean pre-test scores of control and experimental group on Environmental Ethics were 115.2 and 114.6 respectively. This indicated that before the intervention the students of control and experimental group possessed above average level of Environmental Ethics.

4. The mean pre-test scores of control and experimental group on
Environmental Attitudes were 194.56 and 194.08 respectively. It means that before intervention students of control and experimental group had positive and favourable Environmental Attitudes.

Section-II COMPARISON OF THE MEAN PRE-TEST SCORES OF CONTROL AND EXPERIMENTAL GROUP WITH RESPECT TO ENVIRONMENTAL SENSITIVITY, ENVIRONMENTAL AWARENESS, ENVIRONMENTAL ETHICS AND ENVIRONMENTAL ATTITUDES

1. The mean pre-test scores of control group and experimental group on Environmental Sensitivity were 290.66 and 291.66 respectively. Mean pre-test score (290.66) of control group was almost equivalent to that of the mean pre-test score (291.66) of experimental group on Environmental Sensitivity. The computed ‘t’ value for Environmental Sensitivity was 0.602, which was found to be lower than the table value 1.98 at 0.05 level of significance. It indicated that there exists no significant difference between mean pre-test scores of control and experimental group. The two groups did not differ significantly in their Environmental Sensitivity level. So, this revealed that before subjecting to the experimental treatment, the two groups were almost equivalent with reference to their Environmental Sensitivity level.

2. The mean pre-test scores of control group and experimental group on Environmental Awareness were 31.08 and 31.52 respectively. Mean pre-test score (31.08) of control group was comparable to that of the mean pre-test score (31.52) of experimental group on Environmental Awareness. The computed ‘t’ value for Environmental Awareness was 0.699, which was found to be lower than the table value 1.98 at 0.05 level of significance. It indicated that there exists no significant difference between mean pre-test scores of control and experimental group. The two groups did not differ significantly in their Environmental Awareness level. So, this revealed that before subjecting to the experimental treatment, the two groups were almost equivalent.
with reference to their Environmental Awareness level.

3. The mean pre-test scores of control group and experimental group for Environmental Ethics were **115.52** and **114.96** respectively. Mean pre-test score (115.52) of control group was almost similar to that of the mean pre-test score (114.96) of experimental group on Environmental Ethics. The computed ‘t’ value for Environmental Ethics was **0.704**, which was found to be lower than the table value 1.98 at 0.05 level of significance. It indicated that there exists no significant difference between mean pre-test scores of control and experimental group. The two groups did not differ significantly in their level of Environmental Ethics. So, this revealed that before subjecting to the experimental treatment, the two groups were almost equivalent with reference to their Environmental Ethics.

4. The mean pre-test scores of control group and experimental group on Environmental Attitudes were **194.56** and **194.08** respectively. Mean pre-test score (194.56) of control group was almost equivalent to that of the mean pre-test score (194.08) of experimental group on Environmental Attitudes. The computed ‘t’ value for Environmental Attitude was **0.471**, which was found to be lower than the table value 1.98 at 0.05 level of significance. It indicated that there exists no significant difference between mean pre-test scores of control and experimental group. The two groups did not differ significantly in their attitudes towards environment. So, this revealed that before subjecting to the experimental treatment, the two groups were almost equivalent with reference to their Environmental Attitude.

**Section-III EFFECTIVENESS OF EXPERIMENTAL TREATMENT**
**COMPARISON OF THE MEAN POST-TEST SCORES OF CONTROL AND EXPERIMENTAL GROUP**

1. The mean post-test scores of control group and experimental group on Environmental Sensitivity were **295.42** and **300.64** respectively. For the experimental group, the mean post-test score (300.64) on
Environmental Sensitivity was higher than mean post-test score (295.42) of control group on Environmental Sensitivity. The computed ‘t’ value for Environmental Sensitivity was 3.436, which was found to be higher than the table value 2.63 at 0.01 level of significance. It indicated that there exists significant difference between control group and experimental group. So, this revealed that students taught through an Environmental Education Programme Utilizing ICT gained significantly in Environmental Sensitivity.

2. The mean post-test scores of control group and experimental group on Environmental Awareness were 32.68 and 35.08 respectively. For the experimental group, the mean post-test score (35.08) on Environmental Awareness was greater than mean post-test score (32.68) of control group on Environmental Awareness. The computed ‘t’ value for Environmental Awareness was 3.529, which was found to be higher than the table value 2.63 at 0.01 level of significance. It indicated that there exists significant difference between control group and experimental group. So, this revealed that students taught through an Environmental Education Programme Utilizing ICT gained significantly in Environmental Awareness.

3. The mean post-test scores of control group and experimental group on Environmental Ethics were 118.04 and 120.8 respectively. For the experimental group, the mean post-test score (120.8) on Environmental Ethics was higher than mean post-test score (118.04) of control group on Environmental Ethics. The computed ‘t’ value for Environmental Ethics was 3.415, which was found to be higher than the table value 2.63 at 0.01 level of significance. It indicated that there exists significant difference between control group and experimental group. So, this revealed that students taught through an Environmental Education Programme Utilizing ICT gained significantly in Environmental Ethics.
4. The mean post-test scores of control group and experimental group on Environmental Attitude were 196.52 and 199.76 respectively. For the experimental group, the mean post-test score (199.76) on Environmental Attitude was greater than mean post-test score (196.52) of control group on Environmental Attitude. The computed 't' value for Environmental Attitude was 3.017, which is found to be higher than the table value 2.63 at 0.01 level of significance. It indicated that there exists significant difference between control group and experimental group. So, this revealed that students taught through an Environmental Education Programme Utilizing ICT gained significantly in Environmental Attitudes.

Section-IV THE COMPARATIVE EFFECTIVENESS OF ENVIRONMENTAL EDUCATION PROGRAMME UTILIZING ICT AND TRADITIONAL METHOD OF TEACHING IN INFLUENCING ENVIRONMENTAL SENSITIVITY, ENVIRONMENTAL AWARENESS, ENVIRONMENTAL ETHICS, ENVIRONMENTAL ATTITUDES AMONG SECONDARY SCHOOL STUDENTS

1. The mean gain scores of control group and experimental group on Environmental Sensitivity were 4.76 and 8.98 respectively. For the experimental group, the mean gain score (8.98) on Environmental Sensitivity was greater than mean gain score (4.76) of control group on Environmental Sensitivity. The computed 't' value for Environmental Sensitivity was 5.095, which was found to be higher than the table value 2.63 at 0.01 level of significance. It indicated that there exists significant difference between control group and experimental group. So, it was concluded that students taught through the Environmental Education Programme Utilizing ICT gained more in level of Environmental Sensitivity than those taught through the traditional method of teaching.

2. The mean gain scores of control group and experimental group on Environmental Awareness were 1.6 and 3.56 respectively. For the
experimental group, the mean gain score (3.56) on Environmental Awareness was higher than mean gain score (1.6) of control group on Environmental Awareness. The computed ‘t’ value for Environmental Awareness was **3.771**, which was found to be higher than the table value 2.63 at 0.01 level of significance. It indicated that there exists significant difference between control group and experimental group. So, it was concluded that students taught through the Environmental Education Programme Utilizing *ICT* developed higher Environmental Awareness than those taught through the traditional method of teaching.

3. The mean gain scores of control group and experimental group on Environmental Ethics were **2.52** and **5.84** respectively. For the experimental group, the mean gain score (5.84) on Environmental Ethics was greater than mean gain score (2.52) of control group on Environmental Ethics. The computed ‘t’ value for Environmental Ethics was **7.050**, which was found to be higher than the table value 2.63 at 0.01 level of significance. It indicated that there exists significant difference between control group and experimental group. So, it was concluded that students taught through the Environmental Education Programme Utilizing *ICT* gained more Environmental Ethics level than those taught through the traditional method of teaching.

4. The mean gain scores of control group and experimental group on Environmental Attitude were **1.96** and **5.68** respectively. For the experimental group, the mean gain score (5.68) on Environmental Attitude was higher than mean gain score (1.96) of control group on Environmental Attitude. The computed ‘t’ value for Environmental Attitude was **4.906**, which was found to be higher than the table value 2.63 at 0.01 level of significance. It indicated that there exists significant difference between control group and experimental group. So, it was concluded that students taught through the Environmental Education Programme Utilizing *ICT* developed relatively positive
Environmental Attitudes than those taught through the traditional method of teaching.

EDUCATIONAL IMPLICATIONS OF THE STUDY

The findings of the present study have a number of implications for students, teachers, teacher educators, Government and curriculum planners. These implications are presented in the following section:

1. Environmental Education Programme Utilizing ICT motivate the students to present their views regarding environment concepts and they also show concern about the environmental problems. So, the Environmental Education should be imparted to the students through the use of ICT.

2. Teachers should get opportunities to attend workshops and refresher courses etc. to equip them to prepare Environmental Education Programme Utilizing ICT and present the concepts to the students with the help of this programme.

3. All the major Environmental Educational concepts should be included in the Secondary School curriculum.

4. Innovative instructional strategies for Environmental Education curriculum transaction should be used.

5. Teachers should sensitize the students and make them aware of all the Environmental issues and aspects.

6. Rigorous training should be given to pre-service and in-service teachers to learn, to select and blend the different strategies used for preparing ICT based programmes for transaction of the content of Environmental Education.

7. The educational institutions should organize refresher courses for the in-service school teachers to train them to prepare and use the ICT based strategies in transaction of content of Environmental Education in the classroom and become better prospective teachers.
8. The head of the institutions should arrange Environmental Education programmes based on ICT and modern techniques. The principals should arrange seminars, discussions etc. for developing environmental sensitivity, awareness, ethics and positive attitude among teachers and students in the school.

9. More books, journals etc. based on Environmental Education should be made available in the school library.

10. Teachers should be encouraged to participate in seminars, workshops and refresher courses conducted on Environmental issues.

11. Sufficient financial aid should be allotted to organize nature club and sufficient audio visual aids, internet facility should be made available in the schools to explore the Environment.

12. The natural environment and natural resources should be protected and conserved. The government should enforce it through laws and insist the Education Department to instruct the school students to protect and conserve our natural environment. The secondary schools should organize nature club and all the students should be members of this club.

13. The government should also take initiative to allot funds to the schools for organizing nature clubs and for developing innovative teaching strategies for Environmental Education.

14. Teachers should be encouraged to use innovative practices in teaching Environmental Education utilizing ICT. They can be motivated and encouraged by the government by giving certificates and awards to those who are doing innovative practices in developing new strategies of teaching Environmental Education.

15. Effective steps should be taken for revising the present secondary school curriculum with more environmental issues and aspects included in it. So, in the curriculum subject matter of that type should be added
where teacher can use the ICT based programme, to keep pace with the changing society. Teachers should get orientation in teaching through Environmental Education Programme Utilizing ICT and students should be oriented to the ICT based concepts, based on the newly as well as technically introduced curriculum on Environmental Education at all levels of the education.

SUGGESTIONS FOR FURTHER RESEARCH

On the basis of this intensive study, the investigator felt that a series of allied studies might be conducted in accordance with the present one. Some of the areas in which further studies can be carried out are presented in the following section:

1. Similar type of experimental researches can be carried out to compare the effectiveness of ICT programme and traditional method of teaching in other subjects also.

2. It will be useful to conduct the similar research over a large sample including students of different types of schools situated in urban as well as in rural locality.

3. A similar study can also be conducted to examine the effectiveness of Environmental Education Programme Utilizing ICT on the sensitivity, awareness, ethics and attitudes of Primary and higher secondary students belonging to different academic streams.

4. Preparation and validation of educational programmes utilizing ICT in different subjects can be undertaken.

5. A study may be undertaken to find the opinion of the pupils towards ICT based instructions.

6. A study can also be undertaken to examine the attitudes of parents and teachers towards Environmental Education Programme Utilizing ICT.

7. A survey can be conducted to identify the role of various environmental organizations in developing and fostering
Environmental Awareness, Sensitivity, Ethics and Attitudes and in giving Environmental Education at formal, informal and non formal levels of education.

8. Attitude of educational practitioners, administrators, curriculum framers, teachers and environmentalists towards the inclusion of more environmental issues and aspects in school and college curriculum may also be studied.

9. A study can be conducted for preparation of modern instructional strategies to develop environment concerns among students of various classes. Further investigation should be undertaken to find out new instructional strategies for Environmental Education.

10. A study can also be undertaken to analyze the effect of Environmental Education Programme Utilizing ICT on the Sensitivity, Awareness, Ethics and Attitudes of students of different socio-economic strata from all over the country.