CHAPTER V

SUMMARY

5.1.0 INTRODUCTION

Education in general and value education in particular occupies a prestigious place in the modern context of the contemporary society. The problem of value education of the young students has assumed increasing prominence in educational discussions during recent times. Parents, teachers and society at large concerned about values and value education of children. Education is expected to play a major role in promoting national development of all the faculties towards adequate preparation for life. We are witnessing tremendous value crisis throughout the world today. The reappearance of barbaric qualities of selfishness, clashes, conflagration and other destructive forces give clear indication of degeneration process of human society.

According to ICNR Medical Journal Report during the last decade, suicide rate in India increased from 6.4% to 10.5%. There is rapidly increase in crime rates also. So, there is an urgent need for a great effort to receive and reform the values of human life and to rejuvenate the foundation of civilization. Value crisis of the present day life is baffling the minds of educators and the students as well. The democratic ideology that has been accepted by our country is yet to be actualized in the form of social and economics democracy as to realize democratic values guaranteed by the constitution of India. The deterioration of value in education in present day is rapidly increasing. The present Indian educational system is reflecting more or less borrowed ideologies and philosophies while the national values are relegated to the background. The teacher educators and teachers are not being clearly oriented to the national values, personal values, social values, environmental values, ideals and ideologies that hey have to inculcate in students. Hence they are not in a position to play their roles as value educators. Our curriculum does not reflect human values and value system. Hence our school and colleges have become examination centers and not value centers. In educational reconstruction, the problem of an integrated perspective on values in pivotal, for its solution alone can provide organic unity for all the

multifarious activities of a school or college curriculum and programmes. An integrated education can provide for integrated growth of personality and integrated education is not possible without integration of values.

From last few years, our country have observed fall in the basic value which is required for any society to form a strong and healthy society and nation. Value Education is essential for all round development of personality. The NPE (1986) recommended, "Conscious and organized attempts be made for imparting education in social, moral and spiritual values." Hence there is need of serious efforts to integrate values through education system. NCF (2005) also talked about having Peace Education in India's perspective. "Teachers should make deliberate attempts to infuse and reinforce the importance of peace related values that are commensurate with the textual material taught in schools and the developmental stage of children." Peace education can be feasible if the children have essential values like, brotherhoodness, secularism, cooperation, equality, equity, tolerance, respect for other etc. which can be incorporated among children through integrated approach while teaching different subjects. Science being an important and interesting subject for students, there is much more scope for inculcating values while teaching the subject using integrated approach. Adding values with illustrations and examples can also help to make science teaching more interesting.

Education whether it be formal or informal is a very good medium through which there can be proper inculcation of values among children. Many issues in the society occurs due to the decline of values from the society which is not good for prevailing the harmony of the society. All these issues happen due to the deterioration of values in humans. Education system is often blamed for not imparting proper values among children. Hence there is a need for imparting values among students using best practices and integrated approach has the potential to impart values among students in a smooth manner.

Value education is imparted through various ways but when it is related with classroom teaching methods, we see that it enables the teacher to inculcate values through content of the textbook. Here the major role played by the content of textbook to inculcate values among students. The present study focuses on exploring the value

oriented content, finding values from the content, focusing on the values and inculcating those values among the students through teaching science. The study was conducted on the secondary school students as they are mature and future citizens who will play great role in construction of society. Jurseyed (n.d.) has rightly pointed that adolescent is a period of great stress, strain and strive. In face every revolution changes take place in the personality of child at this stage. This is a stage when mental, physical, social and sexual changes take place. By providing value education through different situation, stability can be maintained in the life of adolescent. It is very necessary to provide value education through indirect way of content so that the future of the students can be molded in a better way. Adolescent is a very crucial stage, so it is necessary to provide or to impart the value education at this stage which is imbibed in the contents of different subjects.

On the basis of researches reviewed and the present scenario of Value education in the society, though there are many practice undertaken to inculcate values in education, no one found using integrated approach in inculcating values. Hence, the researcher had undertaken a study where the proper inculcation of few values was done through the process of teaching science. Researcher has opted science as a subject to be taught using integrated approach as it plays important role in the process of transmitting knowledge, culture and values. Science is a subject which is well known for developing better cognitive aspect of human through its problem solving techniques and logic related concepts, these concepts can be very useful for proper inculcation of values and it was done using integrated approach where students were taught values along with the teaching of the content of science.

Secondary education is one of the very important stage of education which precedes elementary education and proceeds higher education. Children of Adolescent age use to be there at secondary education. Value conflict and turmoil is one of the specific characteristic of these children. Hence there is a need to manage these children at this stage through inculcating values through integrated approach. Standard IX being the beginning step in secondary education and students being tender to receive value education, standard IX is considered in the present study. Ten values like, Equality, Co-operation, Simplicity, Dignity of Labour, Determination, Honesty, Common goal,

Discipline, Loyalty to duty and Team work were considered in the present study as there is more scope for relating these values while teaching standard IX science.

5.2.0 RESEARCH QUESTIONS

The following research questions were in the mind of the researcher that lead the researcher to undertake the present study.

- Whether values can be inculcated through integrated approach while teaching science and technology?
- Whether integrated approach of teaching science will affect the achievement of students in science and technology?

5.3.0 STATEMENT OF THE PROBLEM

TEACHING OF SCIENCE AND TECHNOLOGY THROUGH INTEGRATED APPROACH FOR VALUE INCULCATION AT SECONDARY LEVEL

5.4.0 OBJECTIVES OF THE STUDY

1. To develop an intervention programme for teaching of science and technology through integrated approach for the inculcation of values like Equality, Co-operation, Simplicity, Dignity of Labour, Determination, Honesty, Common goal, Discipline, Loyalty to duty, and Team work in regular classroom teaching.
2. To implement the developed intervention programme for teaching of science and technology through integrated approach for the inculcation of the values.
3. To study the effectiveness of the intervention programme on integrated approach for value inculcation in teaching science and technology in terms of conceptual knowledge of values, value perception and value practice along with the achievement in science.
4. To study the reaction of students towards the intervention programme on integrated approach for value inculcation in teaching science.

5.5.0 OPERATIONAL DEFINITIONS

- **Value Perception**: Value perception in a specific value is the score secured by a person in the value perception scale prepared by the researchers.

- **Value Conceptual Knowledge:** Value conceptual knowledge of a specific value is the score secured by a person in the value knowledge test prepared by the researchers.

- **Achievement in science and technology:** The achievement in science and technology in the present study is considered as the total marks secured in the achievement test prepared by the investigator.

5.6.0 EXPLANATION/DEFINITION OF THE TERMS USED

- **Integrated Approach in Science and Technology:** Approach of teaching science and technology for the purpose of achieving the objectives of teaching science and technology along with imparting values during the same process integrating both the concepts of science as well as values.

  Equality: Equality means treating all the person equally without any discrimination on the basis of caste, colour, creed, race sex language, nation or religion

  Co-operation: It is a quality to adjust with people, place and time while working in group, accepting group decision and promoting healthy competition to achieve the group goal.

  Simplicity: It is the quality related to simple and natural living without artificial and ornamental behaviour to influence and free from ego.

  Dignity of Labour: It is the quality of doing any work accepted by the society giving proper respect to it and respecting the jobs of others.

  Determination: It is an act of setting target and working hard to achieve it. It is a firm resolve or intention to do an act seriously and see its end.

Honesty: It is a quality not given to lies, cheating, false or misleading and free from fraud. It is the quality to work or earn in a just and fair manner.

Common goal: This is the quality to accept and respect the goals set by the society for the universal betterment and long term development.

Discipline: It is a systematic and rigorous training of the mental, moral and physical powers for making one self control, obedient and good for the society.

Loyalty to Duty: It is the quality or state or an instant of being loyal and honest to ones' work and responsibility.

Team work: It is the quality of working with others respecting fellow workers, considering own responsibility, following the leader and norms of the group for the betterment of the team mates and the society.

5.7.0 DELIMITATIONS OF THE STUDY

- The present study was delimited to the standard IX English medium students of secondary level following GSHSEB curriculum.
- Values in the present study were limited to ten values viz. Equality, Co-operation, Simplicity, Dignity of Labour, Determination, Honesty, Common goal, Discipline, Loyalty to duty, and Team work.

5.8.0 HYPOTHESES OF THE STUDY

Basically the present study is an experimental study. To test the effectiveness of the developed intervention programme for teaching science through integrated approach to inculcate values, the following null hypotheses were formulated.

$H_0$1: There will be no significant differences between the mean post-test value conceptual knowledge score of standard IX students studying through the value integrated approach and those studying through traditional approach in the value of Cooperation.

$H_0$2: There will be no significant differences between the mean post-test value conceptual knowledge score of standard IX students studying through the value integrated approach and those studying through traditional approach in the value of Dignity of Labour.

$H_0$3: There will be no significant differences between the mean post-test value conceptual knowledge score of standard IX students studying through the value integrated approach and those studying through traditional approach in the value of Equality.

$H_0$4:: There will be no significant differences between the mean post-test value conceptual knowledge score of standard IX students studying through the value integrated approach and those studying through traditional approach in the value of Team Work.

$H_0$5: There will be no significant differences between the mean post-test value conceptual knowledge score of standard IX students studying through the value integrated approach and those studying through traditional approach in the value of Discipline.

$H_0$6: There will be no significant differences between the mean post-test value conceptual knowledge score of standard IX students studying through the value integrated approach and those studying through traditional approach in the value of Determination.

$H_0$7: There will be no significant differences between the mean post-test value conceptual knowledge score of standard IX students studying through the value integrated approach and those studying through traditional approach in the value of Simplicity.

$H_0$8: There will be no significant differences between the mean post-test value conceptual knowledge score of standard IX students studying through the value integrated approach and those studying through traditional approach in the value of Honesty.

$H_0$9: There will be no significant differences between the mean post-test value conceptual knowledge score of standard IX students studying through the value integrated approach and those studying through traditional approach in the value of Common Goal.

$H_0$10: There will be no significant differences between the mean post-test value conceptual knowledge score of standard IX students studying through the value integrated approach and those studying through traditional approach in the value of Loyalty of Duty.

$H_0$11: There will be no significant differences between the mean post-test value conceptual knowledge score of standard IX students studying through the value integrated approach and those studying through traditional approach in the values as a whole.

$H_0$12: There will be no significant differences between the mean post-test value perception score of standard IX students studying through the value integrated approach and those studying through traditional approach in the value of Cooperation.

$H_0$13: There will be no significant differences between the mean post-test value perception score of standard IX students studying through the value integrated approach and those studying through traditional approach in the value of Dignity of Labour.

$H_0$14: There will be no significant differences between the mean post-test value perception score of standard IX students studying through the value integrated approach and those studying through traditional approach in the value of Equality.

$H_0$15: There will be no significant differences between the mean post-test value perception score of standard IX students studying through the value integrated approach and those studying through traditional approach in the value of Team Work.

$H_0$16: There will be no significant differences between the mean post-test value perception score of standard IX students studying through the value integrated approach and those studying through traditional approach in the value of Discipline.

$H_0$17: There will be no significant differences between the mean post-test value perception score of standard IX students studying through the value integrated approach and those studying through traditional approach in the value of Determination.

$H_0$18: There will be no significant differences between the mean post-test value perception score of standard IX students studying through the value integrated approach and those studying through traditional approach in the value of Simplicity.

$H_0$19: There will be no significant differences between the mean post-test value perception score of standard IX students studying through the value integrated approach and those studying through traditional approach in the value of Honesty.

$H_0$20: There will be no significant differences between the mean post-test value perception score of standard IX students studying through the value integrated approach and those studying through traditional approach in the value of Common Goal.

$H_0$21: There will be no significant differences between the mean post-test value perception score of standard IX students studying through the value integrated approach and those studying through traditional approach in the value of Loyalty of Duty.

$H_0$22: There will be no significant differences between the mean post-test value perception score of standard IX students studying through the value integrated approach and those studying through traditional approach in the values as a whole.

$H_0$23: There will be no significant differences between the mean post-test Science achievement score of standard IX students studying through the value integrated approach and those studying through traditional approach.

5.9.0 RESEARCH DESIGN

Quasi experimental design was followed in the present study. As randomization was not used for the selection of both the experimental and control group, the pretest-posttest nonequivalent- groups design was followed in the present study. The design of the present study presented diagrammatically as follow.

O1	**X**	**O2**
O3	**C**	**O4**

O1, O3= Pretests; O2, O4= Posttests; X = Experiment group; C = Control group

The pre-test was administered to the students of both the groups before giving treatment. Post-test was conducted after the treatment period.

5.10.0 POPULATION

All the English medium secondary schools of Vadodara city affiliated to Gujarat Secondary and Higher Secondary Education Board (GSHSEB) were considered as the population of the present study. All the students of standard IX and X of English medium secondary schools of Vadodara city affiliated to GSHSEB during the academic year 2012-13 were considered as the population of the present study. There were 52 English medium both grant-in aid and non grant-in aid secondary schools at Vadodara city affiliated with GSHSEB. So all these 52 English medium secondary schools affiliated to GSEB and nearly 9360 students of standard IX and X of these schools of Vadodara city constituted as a population for the present study.

5.11.0 SAMPLE

The sample for the present study was selected purposively. As per the convenience of conducting the study, the researcher selected the sample for the present study. Vidhyakunj High School, Baroda a granted English medium secondary school

following GSHSEB syllabus was taken as sample. The reason for selecting this school was that the school authority were agreed to co-operate and provide the help needed by the researcher to conduct the entire study. There were two divisions in Standard IX and students of division A formed as the Experimental group and students of division B formed as the Control group. There were 40 and 42 students in the experimental and control group respectively. On the basis of the pre-test achievement in science, the experimental and control groups were made equivalent. After making the groups equivalent, 25 students from division A and 25 students from division B were considered as the sample for the present study.

5.12.0 TOOLS FOR DATA COLLECTION

Considering the objectives of the present study, Achievement Test in Science, Value Conceptual Knowledge Test, Value Perception Test and Reaction Scale were prepared to collect the required data for the study. Researcher with the help of experts in the field of value education and science education designed and prepared the tools and were shown to experts for validation and accordingly given suggestions of the experts were incorporated and the prepared tools were finalized. The tools were also referred to English language experts for language corrections and accordingly necessary modifications and changes were made as per the suggestions of the language experts. Details of the developed tools are given as follow.

5.12.1 Achievement Test in Science

Achievement test in Science was constructed by keeping in mind the content of 2 chapters of science to know the achievement of students which was administered prior and after the intervention programme. It consisted of 60 marks and the time allotted was 1 hour. The achievement test comprised 30 multiple choice type questions, 10 short answer type questions and 5 numerical type long questions. Thus a total of 45 questions were included in the achievement test. The achievement test was divided into two sections viz. objective type questions and subjective type questions. Equal weightage was given to objective and subjective type questions i.e. 30 marks to objective type questions and 30 marks to subjective type questions. Care was taken to include questions of all the points of the selected nine chapters of semester I of

standard IX science. A three dimensional blue print was designed and on the basis of this blue print, the achievement test was developed.

5.12.2 Value Conceptual Knowledge Test

In order to get the conceptual knowledge about the values, a Value Conceptual Knowledge Test was constructed based on the values identified from the content of science textbook. This test consisted of 100 marks. 5 questions were prepared regarding each of the selected values. Questions regarding the meaning, definition, example and characteristics of each value were asked. Thus a total of 50 questions were asked in this test for the selected values.

5.12.3 Value Perception Scale

In order to study the perception of the students about the taken values which were from the content of Science, value perception scale was constructed by the investigator for the standard IX students. 50 close-ended question based on the various daily life situations were framed. Hence the maximum marks for this test is of 200 marks. Four options were given to each question for selection of the answer as per their perception regarding the particular value. The scale was covered 10 values like Equality, Co-operation, Simplicity, Dignity of Labour, Determination, Honesty, Common goal, Discipline, Loyalty to duty, and Team work.

5.12.4 Reaction Scale

To find out the reactions of the students in the experimental group towards the developed programme, the researcher developed a five point reaction scale in order to study the reaction of students towards the value integrated science teaching programme. Twenty-five items having positive polarity were given in the reaction scale. All the twenty-five items were close ended and respondents had to tick mark (√) in the appropriate box ranging from Strongly Agree to Strongly Disagree. The reaction scale was constructed considering the following points regarding developed intervention programme on value integrated science teaching.

- Presentation of content

- Students liking for the developed programme
- Interest of the students
- Participation of students
- Ease in learning the topics of science through the value integrated approach
- Understanding and applicability of knowledge

Considering these points the reaction scale was prepared. All the constructed tools were referred to six experts in the field of Education and Science teaching to judge their adequacy, language and way of presentation and suggestions. Necessary modifications were done as per the suggestions received from the experts. The final version of the tools were also referred to experts in the field of English language for language correction.

5.13.0 DEVELOPMENT OF INTERVENTION PROGRAMME ON VALUE INTEGRATED APPROCH IN TEACHING SCIENCE AND TECHNOLOGY

Recently the text book of science in standard IX was changed as the text book of science and technology. Hence the subject ‘Science’ and ‘Science and technology’ is used interchangeably in the present study. Development of an intervention programme on value integrated approach in teaching science and technology was an important and essential part of this study. In order to achieve the objective 1 of the study i.e. “To develop an intervention programme for teaching of science and technology through integrated approach for the inculcation of values like Equality, Co-operation, Simplicity, Dignity of Labour, Determination, Honesty, Common goal, Discipline, Loyalty to duty, and Team work in regular classroom teaching”, each stage in the process of development of the intervention programme is discussed in this section.

The development of instructional materials was done in the different steps viz. selection of content, identification of values, preparation of lesson plans and pilot

testing. All the steps followed for the development of intervention programme is discussed below.

Step I: Selection of Contents from GSHSEB Standard IX Science Textbook

Nine chapters of first semester were selected by the investigator from standard IX GSHSEB English medium Science textbook. These chapters were selected based on their suitability to inculcate the values through the integrated approach. Based on the selected nine chapters of standard IX science textbook, investigator has identified 10 values which were suitable in integrating into the content of teaching.

Step II: Identification of Values

There are total 83 values which are essential as human values (Fernandez, 2002) and it can be benefit to imbibe the values into future citizens i.e. secondary school students. however, looking into the units and contents of GSHSEB standard IX science textbook, investigator has identified 10 values viz. Equality, Co-operation, Simplicity, Dignity of Labour, Determination, Honesty, Common goal, Discipline, Loyalty to duty, and Team work which were found suitable for integrating into the Science content teaching. The investigator also consulted other school teachers teaching science at secondary level for suitability of integrating 10 values into the teaching of science.

Step III: Preparation of Lesson Plans

After identifying the values which can be inculcated and which can be taught using integrated approach, lesson plans were prepared keeping in mind the instructional objectives of science. The lesson plans were prepared considering the spirit of integrated approach of teaching science and values.

Step IV: Pilot Testing

After developing the initial draft of the intervention programme, it was put into a field try out to find out its suitability for real field investigation. the pilot testing was done with the two objectives i.e. “To find out the difficulties faced by students if any in understanding the contents of Science through value integrated approach” and “To see

if the intervention programme has any effect on the students' achievement level in Science". There were three tools to test the effectiveness of the developed intervention programme viz. Value Conceptual Knowledge Test, Value Perception Test and Reaction Scale. Along with these tests the achievement test in science was used to know the impact of the value integrated approach on the achievement of students in science subject. Before experimentation, the developed programme was validated. For this purpose, the investigator has shown the programme to the secondary school Science teachers and experts in the field of education to know the suitability of the programme. The suggestions received from the experts were taken and accordingly the programme was modified. Pilot test was done in another English Medium school in the Baroda city. Standard IX students were taught science by the investigator with the help of the developed value integrated approach for 10 consecutive classes. Before teaching through the value integrated approach to the pilot group, the investigator explained to the students of pilot study about the purpose of the programme. The group were given freedom to express their views on the value integrated Science teaching. The students were also told to feel free and ask the investigator if they face any difficulty in understanding the contents of Science taught by the investigator through the value integrated approach. On the basis of the pilot testing the required modifications in the lesson plans were done and the final programme for integrated approach of teaching science was ready for the experimentation.

5.14.0 IMPLEMENTATION OF PROGRAMME

The pilot study carried out helped the investigator in finding out the difficulties faced by the students in understanding the Science contents through the value integrated approach. The programme was also validated as per the suggestions of the experts. The investigator had finalized the programme based on its pilot testing and the suggestions of the experts in the field and kept the programme ready for the final experiment. For implementing the value integrated intervention programme for the final experiment the investigator approached the existing school where he is working i.e. Vidyakunj High School, Baroda. Both the Experimental and Control group were selected from this school. Division A of standard IX was selected as experiment group while division B was selected as control group for the experimentation. After

selecting the school and experimental and control groups, the investigator administered the pre-tests on all the students of both the sections. There were 40 students in section A and 42 students in section B. After the administration of the pre-tests, the investigator compared the scores of the students of both the sections and based on equivalent scores of the students, 25 students from each section were selected as a sample for final experiment. The investigator taught the experiment group students with the help of developed intervention programme on value integrated Science teaching. The control group students were taught the same topics by another science teacher in the traditional method. The investigator explained the student of the experimental group about the developed programme on value integrated approach and the purpose of the programme. The orientation took in two periods of Science and the experimental group students were made familiar with the values integrated in the Science lessons. The experimental group students were given liberty to use their ideas, understanding and creativity to inculcate the values in the lessons. Each lesson has the limitation as well as possibility to integrate the value. The students were allowed freedom to share their ideas and knowledge about the particular value among each other and to provide feedback or suggestions on particular value integrated in Science teaching. The experiment took six months.

5.15.0 DATA COLLECTION

For realization of the objectives and to test the null hypotheses, the required data were collected personnel by the investigator. In order to collect the data, the sample students were told about the purpose for which data were collected and instructions were given by the investigator to the respective respondents during the data collection. Before the implementation of the intervention programme, pre-test was administered to the students of both the group: control and experimental group in the form of value knowledge test, value perception scale and achievement test in Science. At the end of the experiment the investigator administered the same tests as post-tests for value knowledge test, value perception scale and achievement test in Science on both the groups. The developed reaction scale was administered on the Experimental group to know their reaction towards the value integrated approach to teach science and technology at the end of the experimentation.

5.16.0 DATA ANALYSIS

To realize the objectives of the present study both quantitative as well as qualitative methods of data analysis were used. The present study was quasi experimental in nature. To achieve the objective III data were analysed quantitatively with the help of mean, standard deviation and u-test. The data for the objective IV has also been analyzed quantitatively with the help of frequency and intensity index. The non-parametric Mann Whitney U-test was used to analyze the data as the sample was taken purposively as it is considered as the most powerful non parametric equivalent of t-test of parametric family. Data collected through reaction scale was analysed quantitatively with the help of frequency and Intensity Index (II). Data collected through observation were analyzed qualitatively using content analysis and triangulation.

Intensity Index (II) is an uncommon statistical technique used in the present study to get the intensity of reaction of the respondents for each statement and the average intensity of reaction for the total programme in a five point scale. The following formula was used to calculate the Intensity Index (II) for a given statement.

II for Statement A=[(F1×5)+(F2×4)+(F3×3)+(F4×2)+(F5×1)]/(F1+F2+F3+F4+F5)

When, the scale values of 5,4,3,2 and 1 are assigned for the scale points of Strongly Agree (SA), Agree (A), Undecided (UD), Disagree (DA) and Strongly Disagree (SDA) respectively on a given statement "A".

And Frequencies for SA, A, UD, DA and SDA are F1, F2,F3, F4 and F5 respectively.

Average Intensity Index (II) is the sum of intensities for all the statements divided by the total number of statements.

5.17.0 MAJOR FINDINGS OF THE STUDY

Following Major findings were drawn for the present study on the basis of analysis and interpretation of the data.

1. The developed intervention programme on value based integrated approach for teaching science was found to be stochastically (significantly) effective in

terms of enhancing students' knowledge and perceptions about the values to the traditional approach.

2. The achievement of students of both experimental and control groups did not differ stochastically in terms of their achievement in Science and Technology. However, the mean achievement of experimental group in Science and Technology was found little more than the mean achievement of control group in Science which is only due to chance. Hence, the implemented value integrated approach in teaching science and technology had no negative impact on the science and technology achievement of students of the experimental group.

3. Teaching Science and Technology through value integrated approach was found equally effective like the traditional approach of teaching science and technology in enhancing the achievement of standard IX students.

4. The developed intervention programme on value integrated approach to teach science and technology was also found to be effective in terms of the reaction of students towards the programme as most of the students showed favorable reaction towards most of the components of value integrated approach for learning science as a whole.

5. The developed intervention programme on value integrated approach for teaching science and technology was found to make the students interested in learning science, having inculcation of values among students and considering the value integrated approach in learning science and technology.

5.18.0 OBSERVATIONS DURING THE EXPERIMENT

During the experiment, the researcher keenly observed the behaviour of students related to the learning of science with the help of the developed intervention programme on value integrated approach. Some of the main observations were as follows:

- Students were very active in learning science in value integrated approach. This indicates that they liked to learn science through the value integrated approach.

- Students were eager to know more about the values which showed their interest in learning science through value integrated approach.

- During the experiment it was also found that students were helping each other while interacting during the intervention programme. The researcher noticed that the students were discussing their knowledge and ideas about the different values with their peers and trying to understand the concept of values by themselves. They were found working in small groups. It indicates that learning with value integrated approach inspired the students to work in group and to have cooperative learning.

- It was also noticed that most of the students went through the value integrated approach. This showed that the developed programme inspired the students to imbibe the values in their study activities.

- Most of the students were found interested in the story, materials and different activities given in the value integrated approach. With the help of story and activities, they tried to link their theory knowledge of values with the practical.

- It was noticed that the students were trying value integration in other subjects too. In this way, the students tried to inculcate values themselves.

- The students were found approaching the teacher (researcher) while learning Science with the value integrated approach. They also showed the teachers the way they had completed the exercises and expressed their feelings about the contents. They also expressed their positive feelings about the value inculcation, activities, extra reading material for teaching-learning Science.

- It was also found that the students were practicing with the help of value integration in their daily living activities.

- The students were inculcating different values themselves with the help of value integration in their different activities. They were also found very much eager to know their result. In case of poor result, they were found repeating again and again to learn more about the values.

- The overall observation of the researcher shows that the students were enjoying the learning with the developed intervention programme on teaching science through value integrated approach.

5.19.0 IMPLICATIONS OF THE PRESENT STUDY

The value education should be given through integrating it with different school subjects as the present time demands value based education. Presently, there are lots of crisis, issues, corruptions, scandals and other problems all over the globe. As a developing country, India needs to produce better future citizens with sound mind who can cope with the real life difficulties and also can maintain their culture. The present study is an effort to integrate values in teaching Science and the effect of the value integrated approach on the learning of the students. It was just an attempt to find out an innovative way of teaching Science and to check the effectiveness. The following are some of the suggested implications of the present study on the basis of the major findings.

- To produce effective manpower with cultured citizens from the schools teachers should integrated values in their teaching-learning process so that students will practice the values in their daily life.

- Not only the topics which were taught through the value integrated approach by the researcher but other topics of the Science and other subjects also should be taught with the help of value integrated approach.

- The teaching through the value integrated approach affects more senses of the students and they make use of the learnt concepts of values in their real life.

- Value integrated approach shows the innovative way of providing value education and makes teaching-learning more fruitful and interesting.

- Use of value integrated approach for teaching Science has showed positive result as well as favourable views of students but it can be used with practical activities and discussion for better understanding of the students.

- Value integrated approach proved to be reducing the burden of the student as well as the teachers by making the teaching-learning process more joyful.

5.20.0 CONCLUSION

The value integrated approach for teaching Science to standard IX students of GSHSEB was found equally effective like the traditional approach of teaching science in enhancing the achievement of standard IX students and the implemented value integrated approach in teaching science had no negative impact on the science achievement of students of the experimental group. The developed value integrated intervention programme was found to be effective in enhancing students' knowledge and perceptions about the values in comparison to the traditional method of teaching. The developed intervention programme on value integrated Science teaching was also found effective in terms of the liking of students towards the programme that was revealed form of value integration for the teaching of Science. The values are very important in today's world as different school boards also emphasizing value education for school going children. However, teachers find it difficult to teach value education as a separate subject due to teaching and other assignments of compulsory subjects. Thus the value integrated approach proves effective one for providing value education with the subject teaching. Value integrated approach is also useful for the students in imbibing different values through its practices in their convenient time and this minimizes the issues related to the behaviours of the students in schools. Now there is a need to prepare such type of value integrated programmes or packages in different areas of Science and also in different subjects to provide the value education to the students of different board schools. Technology based value education packages also could be prepared for excelling the students in Science as well as in different subjects. Technology blended value education in teaching different subjects will create the better future of students by the way of imbibing different values during the teaching-learning.

5.21.0 SUGGESTIONS FOR FURTHER STUDIES

- The present study was delimited to the ten values viz. Equality, Co-operation, Simplicity, Dignity of Labour, Determination, Honesty, Common goal, Discipline, Loyalty to duty, and Team work only. In order to get comprehensive picture regarding the effectiveness of value integrated approach in teaching science, other values can be covered in teaching entire syllabus of science and a comprehensive intervention programme on value integrated approach can be developed.

- Value integrated intervention programme can be developed for teaching Commerce and Art subjects.

- The study was conducted on the secondary school students. Such studies can be conducted by taking sample from primary, high school and college students.

- Studies can also be conducted by taking other board schools. Comparison also can be done by taking samples from different board schools.

- Studies can be conducted on measuring effectiveness of such value integrated approach by taking different variables like gender, caste, school board, medium of instruction and interest in teaching science.