CHAPTER – V

SUMMARY, FINDINGS, IMPLICATIONS, SUGGESTIONS AND CONCLUSION

5.1 INTRODUCTION

This chapter deals with the research process and highlights the important findings, their educational implications and suggestions for further research.

There is a change in the quality of education due to emergence of a new science and technological paradigm based on information and communication technologies. There is no doubt that science and technology has made both quantitative and qualitative growth by affecting positively and negatively each and every aspect of school education. C.V. Raman, the Indian Nobel Laureate in Physics said “it is the brain that work and not the machine”. It is very much true that more possession of latest technologies will not mean their utility, but the attitude have to be changed if we want to introduce effective Multimedia Approach in the school. In the words of Argentinean writer Gabriella Marcel, “We must act now. We cannot wait for everything to be right for bandwidth to increase and technology penetration to increase in schools. Many things in life can wait but the child cannot. Now is the time and his mind is being shaped. His name is not tomorrow. It is today”.

Now time has come for educationalist, school administrators, teachers and even parrots to visualize the global impact of Multimedia. There is a great need to reshape our educational system at all levels of teaching learning and take active and practical initiative in bringing the Multimedia into the classroom for regular teaching.
5.2 TITLE OF THE STUDY

The problem selected for the present study is “EFFECT OF MULTIMEDIA APPROACH ON KNOWLEDGE AND SKILLS IN AND ATTITUDE OF STUDENTS TOWARDS SCIENCE AT UPPER PRIMARY LEVEL”.

5.3 VARIABLES OF THE STUDY

The experimental study was designed with the following variables:

a) Independent Variable

- Multimedia Approach (MMA)

b) Dependent Variables

- Achievement of Knowledge in science
- Attainment of Skills in science
- Attitude towards science

5.4 OBJECTIVES OF THE STUDY

The study was taken up with the following objectives:

1. To develop instructional material based on Multimedia Approach in science at Upper Primary Level for developing Knowledge, Skills and Attitude.

2. To study the effectiveness of Multimedia Approach over the Conventional method in science at Upper Primary Level for developing Knowledge, Skills and Attitude.

3. To study the gender differential effectiveness of Multimedia Approach and Conventional method in science at Upper Primary Level for developing Knowledge, Skills and Attitude.
5.5 HYPOTHESES OF THE STUDY

1. The students exposed to MMA will have greater achievement in science than the Conventional method at Upper Primary Level in terms of Knowledge.

2. The students exposed to MMA will have greater achievement in science than the Conventional method at Upper Primary Level in terms of Skills.

3. The students exposed to MMA will have greater Attitude towards science than the Conventional method at Upper Primary Level.

4. The effect of MMA and Conventional approach in science will be different on boys and girls at Upper Primary Level in terms of development of Knowledge.

5. The effect of MMA and conventional method in science will be different on boys and girls at Upper Primary Level in terms of development of Skills.

6. The effect of MMA and Conventional method will be different among boys and girls at Upper Primary Level with respect to Attitude towards science.

5.6 PROCEDURE

The study was designed to develop MMA for acquisition of Knowledge and Skills in science and development of Attitude scale to develop Attitude towards science among Upper Primary students. In order to test the efficacy of the MMA, an experimental study was conducted.

a) Sample

The sample selected for the experimental study was 100 students of VII standard from Kunnamangalam Higher Secondary School, Kunnamangalam, Kozhikode District, Kerala. The sample was divided into two groups – an Experimental group and the Control group, with 50 students in each group.
b) Tools used for the study

The tools used in the present study are:

- Achievement test on knowledge in science
- Achievement test on attainment of Skills in science
- Multimedia Approach (MMA)
- Attitude scale

c) Statistical Techniques used

- Descriptive statistics such as Mean and Standard Deviation.
- ‘t’ test to compare the achievements of Experimental and Control groups

5.7 MAJOR STEPS INVOLVED IN THE STUDY

- Analysis of the text books and syllabi of VII standard.
- Study of theoretical aspects and principles adopted for the development of MMA.
- Preparation of MMA on selected six chapters in science of VII standard based on principles.
- Description of the MMA developed by the investigator.
- Validating the developed MMA and ascertaining its effectiveness.
- The efficacy of the MMA is tested by conducting an experimental study on a sample of 100 students of VII standard.

5.8 STAGES OF EXPERIMENT

1. Selection of Experimental Group and Control Group

Two divisions of VII standard students from Kunnamangalam Higher Secondary School were selected. Because of the close acquaintance with the teachers of the school, a preliminary grouping of the students with respect to their achievement in science was possible. The students were thus divided into two equal groups with 50 students in each division. The investigator ascertained the homogeneity of the
groups with the help of the scores obtained from the pre test in science and Attitude scale. Thus the students were grouped into Control Group and Experimental Group.

2. The Conduct of the Experiment

During the treatment stage, the students of the Experimental Group were provided instruction and learned the content through the MMA under the supervision and guidance of the investigator. The Control Group was given instruction and learned through the Conventional method.

3. Testing

At the end of the experiment a common post test was administered in both the groups. The difference between the Mean gain scores were calculated and analysed.

5.9 MAJOR FINDINGS OF THE STUDY

The following are the major findings of the study.

1. There is a significant difference (‘t’ value – 93.16) between the pre test and post test means on achievement of Knowledge in science of Experimental group which means that the students of Experimental group could achieve more after treatment with MMA.

2. There is a significant difference (‘t’ value – 59.53) between the pre test and post test Mean on achievement of Knowledge in science of Control group which means that even the students of Control group could achieve more even after the Conventional method of teaching.

3. The ‘t’ value between the gain scores of Experimental group and Control group on achievement of Knowledge in science is 21.46. This shows a significant difference between Experimental group and Control group, which means that the MMA has been more effective than the treatment in the Control group in the achievement of Knowledge in science.
4. There is a significant difference (‘t’ value – 8.09) between pre test and post means of attainment of Skills in science of Experimental group which means that the students of Experimental group could achieve more on attainment of Skills after treatment with MMA.

5. There is a significant difference (‘t’ value – 7.97) between the pre test and post test Means on attainment of Skills in science of Control group which means that the students of Control group also could achieve even after the Conventional method of teaching.

6. The ‘t’ value between the mean gain of Experimental group and Control group on attainment of Skills in science is 13.39. This shows a significant difference between the Experimental group and Control group which means that the students of Experimental group could achieve higher Mean on Skills after treatment with MMA.

7. There is a significant difference (‘t’ value – 18.31) between the pre test and post test Mean of Attitude towards science of Experimental group which means that the students of Experimental group could achieve higher mean after treatment with MMA.

8. There is a significant difference (‘t’ value – 9.8) between the pre test and post test Mean on Attitude towards science of Control group which means that the students of Conventional group could achieve even after Conventional method.

9. The ‘t’ value between the mean gain of Experimental group and Control group on Attitude towards science is 33.16. This shows a significant difference between Experimental group and Control group which means that the students of Experimental group could achieve higher mean on Attitude towards science after treatment with MMA.
10. There is a significant difference (‘t’ value – 2.75) between the Mean of girls and boys with respect to the pre test on achievement of Knowledge in science of Experimental group. The result indicates that the pre test Mean on achievement of Knowledge in science of boys (M = 5.77) is higher than the girls (M = 4.84) which means that boys could achieve more in the pre test on Knowledge in science for the Experimental group.

11. There is a significant difference (‘t’ value – 2.87) between the Mean of girls and boys with respect to the post test on achievement of Knowledge in science of Experimental group. The result indicates that the post test Mean on achievement of Knowledge in science of boys (M = 35.94) is higher than the girls (M = 33.32) which means that boys of Experimental group could achieve more in the post test on Knowledge in science.

12. The ‘t’ value between the gain scores of girls and boys with respect to the achievement of Knowledge in science for the Experimental group is 2.63. The result indicates that the Mean gain of the achievement test on Knowledge in science for boys (M = 32.16) was higher than the girls (M = 30.13) which means that the boys of Experimental group could achieve more in the test of achievement of Knowledge in science which shows that the MMA was more effective for boys than girls.

13. There is no significant difference (‘t’ value – 1.87) between the Mean of boys and girls with respect to the pre test achievement of Knowledge in science for the Control group which means that the boys and girls of Control group could not achieve better in the pre test on achievement of Knowledge in science.

14. There is no significant difference (‘t’ value – 1.52) between the Mean of boys and girls with respect to the post test on achievement of Knowledge in science for the
Control group which means that the boys and girls of Control group do not differ much in their achievement of Knowledge in science.

15. The ‘t’ value between the Mean gain of girls and boys of Control group on achievement of Knowledge in science is 1.14. This shows that there is no significant difference between the Mean gain of girls and boys on achievement of Knowledge in science of the Control group which means that the Conventional method of teaching was equally effective for both girls and boys of Control group.

16. There is a significant difference (‘t’ value – 2.59) between the Mean of girls and boys with respect to the pre test on attainment of Skills in science for the Experimental group. The result indicates that the pre test means on the attainment of Skills in science for boys (M = 4.65) is higher than the girls (M = 3.47) which means that the boys could achieve more in the pre test on attainment of Skills in science than girls.

17. There is a significant difference (‘t’ value – 3.26) between the Mean of girls and boys with respect to the post test on attainment of Skills in science for the Experimental group. The result indicates that the post test scores on attainment of Skills in science for boys (M = 29.23) is higher than the girls (M = 26.69) which means that the boys could achieve more than girls in the post test on attainment of Skills in science which shows that the MMA was more effective for boys than girls.

18. The ‘t’ value between the Mean gain of girls and boys of Experimental group on attainment of Skills in science is 3.87. This shows a significant difference between girls and boys on attainment of Skills in science of Experimental group which means that the MMA was effective for boys (M = 35.17) than girls (M = 33.26).
19. There is no significant difference (‘t’ value – 1.76) between the Mean scores of girls and boys with respect to the pre test on attainment of Skills in science for the Control group which means that both the girls and boys of Control group could perform almost equally in the pre test on attainment of Skills in science.

20. There is no significant difference (‘t’ value – 1.63) between the Mean of girls and boys with respect to the post test on attainment of Skills in science for the Control group which means that both boys and girls of Control group could not achieve better in the post test on attainment of Skills in science.

21. The ‘t’ value between the mean gain of girls and boys of Control group on attainment of Skills in science is 1.21. This shows that there is no significant difference between the girls and boys of Control group on attainment of Skills in science which means that the Conventional method of teaching was equally effective for the girls and boys of Control group on attainment of Skills in science.

22. There is a significant difference (‘t’ value – 5.31) between the pre test Mean of girls and boys of Experimental group with respect to the Attitude towards science. The result indicates that the pre test Mean on the Attitude towards science for boys (M = 105.61) was higher than the girls (M = 100.68) which means that the boys could achieve more than girls in the pre test on Attitude towards science.

23. There is a significant difference (‘t’ value – 3.26) between the post test Mean of girls and boys of Experimental group with respect to the Attitude towards science. The result indicates that the post test Mean of the Attitude towards science for girls (M = 120.1) was higher than boys (M = 119.74) which means that the MMA was effective for girls than that of boys on development of Attitude towards science.
24. The ‘t’ value between the gain scores of girls and boys of Experimental group with respect to Attitude towards science is 3.24. This shows a significant difference between girls and boys on developing Attitude towards science which means that the MMA was effective for girls (M = 19.53) than boys (M = 14.13) on developing Attitude towards science.

25. There is no significant difference (‘t’ value – 1.01) between the pre test Mean of girls and boys with respect to the Attitude towards science of Control group which means that both the girls and boys could perform equally in the pre test on Attitude towards science.

26. There is a significant difference (‘t’ value – 4.28) between the post test scores of girls and boys of Control group with respect to the Attitude towards science which means that the girls (M =113.02) could achieve more than boys (M = 105.29) in the post test on Attitude towards science.

27. There has been a loss in the development of Attitude towards science for both boys and girls. The ‘t’ value between the Mean loss of girls and boys with respect to the Attitude towards science for the Control group is 2.84. This shows a significant difference between girls and boys of Control group on developing Attitude towards science. The loss has been more for boys (M=14.23) and less for girls (M=7.68).

28. There is a significant difference (‘t’ value – 26.92) between the post test Mean of Experimental group and Control group on achievement of Knowledge in science. The result indicates that the post test mean on achievement of Knowledge in science for Experimental group (M = 48.54) is higher than the Control group (M=34.94) which means that the MMA is very effective on achievement of Knowledge in science.
29. There is a significant difference (‘t’ value – 14.88) between the post test Mean of Experimental group and Control group on attainment of Skills in science. The result indicates that the post test Mean of Experimental group on attainment of Skills in science (M = 9.86) was higher than the Control group (M = 6.66) which means that the MMA was very effective on attainment of Skills in science.

30. There is a significant difference (‘t’ value – 3.93) between the post test Mean of Experimental group and Control group on Attitude towards science. The result indicates that the post test Mean of Experimental group on developing Attitude towards science (M = 108.34) is higher than the Control group (M = 103.74) which means that the MMA has been very effective on developing Attitude towards science.

5.10 EDUCATIONAL IMPLICATIONS

The present study is a modest attempt to explore the effect of Multimedia Approach on achievement of Knowledge and Skills in and Attitude towards science at Upper Primary Level. The investigator here suggests the following educational implications in the light of the present study.

- The study has shown that MMA used for achieving Knowledge and Skills in science would help in the nurturing of scientific knowledge of students.
- In this study the various components of MMA used including charts, pictures, videos and different activities performed would enhance the science learning in a positive way.
- The study has revealed that achievement of Knowledge and Skills in science would help in the modification of Attitude towards science.
• Students would develop scientific values, get opportunity to learn science in a fruitful way, scope for doing practical work, thinking about future participation in science, develop self concept in science, understand importance of science and use science outside the school with this study.

• Study has shown that the greater Attitude towards science was developed among the students which would help to change their behavior and establish an interest to understand science in a better way.

• This study would help the teacher to develop MMA materials for other chapters and other subjects also through in service, pre service and teacher training courses also.

• Students get opportunities to represent and express their knowledge in science with Multimedia materials provided in the classroom teaching.

• Knowledge about the science through Multimedia would help in the modification of existing science knowledge of the students of Upper Primary Level.

• The science curriculum in schools can be modified by incorporating the Multimedia materials which would help the science learning in a more beneficial way to the school students.

• Teaching science with Multimedia materials would encourage students to develop deep reflective scientific thinking.

• Achievement of Knowledge and Skills in science with Multimedia teaching would help to develop interest in students to learn science.
5.11 SUGGESTIONS FOR FURTHER RESEARCH

Following suggestions are offered for the further study:

- The study was focussed on the effect of Multimedia Approach on Knowledge and Skills in and Attitude towards science at Upper Primary Level. A study with other variables like scientific attitude, scientific aptitude, etc. can also be studied with Multimedia Approach.

- The present study was confined to VII standard students of only one CBSE school of Kerala state; further researchers can extend the study by covering other schools of same state or different states.

- The study is focussed only on the achievement of Knowledge and Skills in and Attitude towards science. The same study can be taken for other subjects with the same variables or considering the suitable variables of other subjects.

- For teaching other theoretical curriculum, the Multimedia Approach would be used and the expansion of Multimedia can be done by considering the various components with interactive effect.

- More studies can be conducted on using Multimedia in the academic curriculum in the school atmosphere.

- The present study can be done taking a large sample of students at various state level and district level also.

- The present study can be undertaken by involving the same variables and different variables at the Primary level, Secondary level, College level, etc.
5.12 CONCLUSION

Developing Attitude towards and creating interest in science learning is the most important outcome of science learning. In the present study the investigator made an attempt to find out the Effect of Multimedia Approach on achieving Knowledge and Skills in science and also developing Attitude towards science. The study reveals that the Multimedia Approach using in the science class rooms especially at Upper Primary Level is very effective. The students of VII standard on which the treatment were done could achieve more in their acquisition of knowledge skills in science when compare to the students taught by Conventional method. The students treated with MMA could develop greater Attitude towards science than that of the Control group. The present study would help in the modification of science behaviour of students and the students could understand the importance of science learning by performing activities and experiments in the class room.

The investigator concluded by the study that the Multimedia Approach can be used very effectively in the science class rooms at Upper Primary Level to develop Knowledge and Skills in and Attitude towards science. Therefore these variables can be considered as important factors in school science curriculum.