Chapter – 6

Summary, findings, areas for further research and limitations
SUMMARY, FINDINGS, AREAS FOR FURTHER RESEARCH
AND LIMITATIONS

6.1. Introduction

School science education needs to respond to a changed social context and to help prepare young people to contribute as citizens to shaping the world in which they will live. The world is becoming more and more competitive. The desire for high level of science achievement puts a lot of pressure on teachers and schools, including the educational system in general and on students in particular. The whole system of education revolves around the academic achievement of the students especially in science. Thus, a lot of time and effort of the schools is directed towards helping students to perform better in all scholastic areas. To maximize the achievement in science within a given set of conditions, therefore, has become the realistic goal of every education. Therefore, there is need to know the factors which are deterrent to it. In view of the rapid changes being witnessed in organization, curricula and teaching techniques, it becomes still more pertinent to seek systematic information on the significant correlates of achievement in science. Such factors when identified have practical and theoretical implications for developing curricula and designing educational programs to suit the needs of the pupils with varied background. Research findings on the theme, it is hoped, would lead to improved curriculum development, efficient of teaching and better academic achievement.

Thus, the present study is an attempt to find out the achievement in science in relation to various factors such as attitude towards multimedia information technology, socio-economic factors, personal factors and institutional factors.
6.2. Statement of the problem

“A Study of Secondary School Students’ Achievement in Science in Relation to Attitude towards Multimedia, their Socio-Economic Status and Certain Personal and Institutional Factors ”

6.3. Objectives of the study

The investigator has started the work with the following objectives:

1. To study the general features of science achievement of secondary school students.

2. To study the attitude towards multimedia information technology (combination of audio-video, text, graphics, sound, animation etc.) in relation to science achievement.

3. To study the socio-economic status (upper, middle and lower classes) in relation to science achievement.

4. To study the personal factors (gender difference, religion, parental education and occupation, family size, pre-primary education, type of primary education, type of assistance, computer and internet access friends interested in computers, time spent on study at home, school sponsored sports activities, educational tours organized by schools, on-school hours playing with friends and choice of stream) in relation to science achievement.

5. To study the institutional factors (private and government, convent and non-convent, single-sex and coeducational, urban and rural, English and Hindi medium, multimedia and non-multimedia schools) in relation to science achievement.
6.4. Hypotheses of the study

The study was conducted after formulating the following research hypotheses in the light of its above-mentioned objectives:

1. There is no significant difference in science achievement in relation to attitude towards multimedia information technology (combination of audio-video, text, graphics, sound, animation etc.) of students.

2. There is no significant difference in science achievement in relation to socio-economic status (upper, middle and lower classes) of students.

3. There is no significant difference in science achievement in relation to personal factors (gender difference, religion, parental education and occupation, family size, pre-primary education, type of primary education, type of assistance, computer and internet access friends interested in computers, time spent on study at home, school sponsored sports activities, educational tours organized by schools, on-school hours playing with friends and choice of stream) of students.

4. There is no significant difference in science achievement in relation to institutional factors (private and government, convent and non-convent, single-sex and coeducational, urban and rural, English and Hindi medium, multimedia and non-multimedia schools) of students.

6.5. Review of the related literature

The review of related literature embodies the work done on different factors influencing the achievement in science of secondary school students. The investigator had gone through many journals, magazines, surveys, library, etc. and found a number of studies related to the present problem. The notable names of
the researches who had conducted research studies from 1964 to 2008 are as follows:

6.6. Methodology and design of the study

Before conducting any research study, it is necessary to make a systematic plan and to take decisions, which are crucial for the successful achievement of the study’s objectives. The method adopted for this study was descriptive and statistical nature. The sample used for study of secondary school students’ achievement in science forms the main sample of the study in view of the objective of the investigation which sought to find its relationship with some other student characteristics such as attitude towards MIT, socio-economic status, personal and institutional factors. In all 1500 students were involved in the study of the relationship between science achievement and their attitude towards MIT, socio-economic status, personal and institutional factors. All students who participated in the investigation were studying science as one of their academic subjects at standard 9th; their ages ranged between 15 and 17 years.

6.6.1 Sample of the study

The sample was selected keeping in view the needs and objectives of the study. It should be mentioned that these students have been chosen from 30 schools of Western U. P., (India). Out of 30 schools selected 18 were private which includes 1008 students and 12 were government schools which includes 492 students. Out of these seven are girls’ schools; eighteen co-educational and the rest are boys’ schools. The number of the male students is more than that of female students, their numbers being 813 and 687 respectively.

6.7. Data collected for the study

The following baseline data were collected for carrying out the present investigation:

1. Data used for development of Multimedia information technology attitude scale.
2. Scores on the science achievement of the students.
4. Scores of the students’ personal factors.
5. Data related to institutions of the students.

6.8. Tools used for the study
The following tools were used by the investigator for the collection of data.
1. Multimedia information technology attitude scale (developed by the investigator)
2. Socio-economic status scale (modified by the investigator)
3. Science achievement test (developed by the investigator)
4. Personal information sheet (prepared by the investigator)

6.9. Statistical techniques employed
The analysis of the data was done by using statistical techniques, which were chosen only after investigator found them to be most appropriate and compatible for the analysis of data. They are as follows:

- Determination of the reliability and validity of the MITA Scale, Socio-economic status scale and science achievement test using known techniques.
- Computation of mean percentage of science achievement test.
- Computation of mean and standard deviation.
- Use of linear measure of correlation (Pearson’s Product Moment Coefficient Correlation).
- Use of F-test for measuring the significance of difference among many means.
- Use of t-test for measuring the significance of the difference.
6.10. Findings

After statistical analysis, the following conclusions were drawn in accordance with the hypotheses and results of the hypotheses and results of the study:

1. **Attitude towards MIT and achievement in science.**
   The attitude towards MIT and achievement in science are positively correlated in this study. The higher the attitude of students towards MIT, the higher is the achievement in science.

2. **Socio-economic status and achievement in science.**
   Socio-economic statuses of students have been shown to have a direct positive association with achievement in science. The higher the SES of students, the higher is the achievement in science. The children of upper economic strata and lower economic strata differed in science achievement very significantly. The upper and the middle economic groups differed in science achievement significantly. The middle and the lower economic groups differed in science achievement significantly.

3. **Personal factors and achievement in science.**
   - There exists no significant difference between male and female students so far as their achievement in science is concerned, i.e. gender did not relate to science achievement. Both the groups are equally good or bad in the same measure.
   - There exists no significant difference in science achievement of muslim and non-muslim students.
   - In this study parental education is found to be an important factor of children’s achievement in science. Children from highly educated parents are likely to have significantly higher science achievement as compared to the children of less educated parents.
   - It has been found that father’s occupation is related to their children’s achievement in science. The nature of father’s occupation is important
for their children’s science achievement. Children of professional group have achieved highest score than all other groups. There was significant difference between achievement scores in science of children of housewife and working mothers.

- The study also explained the relationship between students’ achievement in science and their family size. Children of smaller family size have got significantly higher achievement in science than the children of larger family size.

- Knowledge of how students started their pre-primary education can help in predicating their performance in science in higher classes. This result presented support that students who started their education from play schools brings some benefits for students in science achievement.

- In this study school type at primary level has envisaged as a significant contributor in the determination of science achievement. The students of private schools have got significantly higher score in science than the students of government schools.

- The statistical result revealed that type of assistance (familial assistance, no assistance and assistance by tutor/coaching centre) is not related to the achievement in science. Students perform in science in all the cases equally. Thus the study reveals that the intensity of tution availed will not improve science achievement.

- The results showed that the achievement in science of students having access to computer was significantly better with the one that does not.

- The present result indicated that the students having access to internet have significantly better science achievement than those who have not access to internet.

- The result showed that mean achievement scores of students whose friends were interested in computers had significantly better science achievement.
• The result presented support the idea that study at home brings some benefits for students. The result shows that those students who spent more than two hours on study at home have more achievement in science than the students who spent less than two hours.

• The result indicated that the students who have participated in school sponsored activities have higher science achievement than the students who have not participated.

• The result indicated that the students who have participated in educational tours organized by the schools have higher science achievement scores than the students who have not participated in such type of tours.

• In this study, science achievement was predicted in the best way by the amount of time spent playing with friends outside schools. The result indicates that students who spent more than two hours daily on playing with their friends outside schools is negatively associated with science achievement than those who spent less than two hours time.

• The result indicated that students who will opt science stream at higher classes have higher mean achievement than their counterparts (who will opt non-science stream).

4. Institutional factors and achievement in science.

• The statistical result showed that students of government schools secured significantly lower achievement scores in science than private school students.

• The students of convent schools achieved significantly higher achievement in science than the students of non-convent schools.

• The statistical result showed that the science achievement of students in co-educational schools were significantly higher than that of boys as well as of girls student in single-sex schools. Further, it was found that boys of co-educational schools have significantly higher achievement in
science than the boys of single-sex schools and also girls of co-educational schools have significantly higher achievement in science than the girls of single-sex schools.

- The result showed that students of urban schools excelled in science than their rural counterparts.
- The result revealed that students of English medium schools achieved significantly higher achievement scores in science than Hindi medium school students.
- The statistical result indicated that students of multimedia schools (having computer for practical) have got significantly higher achievement scores in science than the non-multimedia school (not having computer for practical) students.

6.11. Implications

Clearly the results of this study have implications for governments, parents, educational planners and policy makers and the school authorities as well as for further research. The design of effective and efficient education policies requires a more comprehensive knowledge of the determinants of educational achievement. The results of this study suggest that there is a pressing need for more effective polices that seek to minimize the undesirable consequences of discrepancies in science achievement. Government key policy deliberations must include formulating sound educational policies that provide appropriate support for parents, students, teachers and school, modifying curriculum, and adapting instructional practices. Educational policies could be designed that specifically take into account the school characteristics and family background characteristics of students.

The results might have some practical implications for science curriculum design in terms of enhancing interest in integrated science subject. The results of
the study provide new information on the interrelationship of various factors and students' science achievement.

Educators and researchers cannot assume that by installing computers with various types of software in schools, the achievement level of the students will automatically increase. The relationship between computer use and achievement is much more complicated than it might initially appear. In light of the findings in this study and other research that supports similar assertions, it must be emphasized that it is not computer use itself that automatically affects the student’s achievement in school, but the “how” it is used that affects the quality of its results. Computers in education should not be studied in isolation nor as mere vehicles, but within the context and structure of programs and settings in order to examine how the synergy of technology, instructional methods, subject matter, and other contextual factors provide the conditions necessary to support knowledge construction and learning when teachers and learners are separated.

This report has shown a strong link between SES and student achievement. The link was found to influence differences in achievement levels between students and differences in achievement levels between schools. Planning for and delivery of education should take into account the parents’ SES. Teachers as implementers of educational facilities should have a balanced view of children from various SES background as to blend their teaching so that all will benefit equally. Parents whether high SES, middle SES or low SES should strive to provide extra incentive for their children in the school. The main recommendation that can be put forward from this study is the need to concentrate on improving pupils’ experience of science in school.

6.12. Areas for further research

When the present study was in progress, certain problems closely related to the area of this work came up before the investigator. These problems, if investigated along the present work, would help in clarifying the conceptual
misgivings and confusions. Some of these research problems related to the present area may be taken by the researchers in future. Thus the following recommendations for further research and study are offered:

1. Gifted and non-gifted children and their achievement in mathematics and science.
2. Influence of scientific attitude on achievement in science.
3. Influence of cognitive factors on academic achievement.
4. Influence of teaching methods on the achievement in science.
5. Students’ self-efficacy towards science learning and achievement in science and mathematics.
7. Students’ academic achievement and its correlation with their skill and interest.
8. Students from advantaged and disadvantaged backgrounds and their science performance.
9. Teacher expectations and students’ academic achievement.
10. Teacher-pupil relationship and achievement in mathematics and science.
11. Peer influence on students’ academic achievement.
12. Influence of reinforcement, modeling and teaching skills on science achievement.

6.13. Limitations

The limitations of this study are as follows:

1. The present study was focused upon the achievement of secondary school students only. It did not study the achievement of elementary, graduate and postgraduate students.
2. The study was conducted in mostly urban areas only. The sample includes only 345 students (8 schools) from rural areas; therefore, one
cannot generalize the findings of this study to all the institutions of India due to number of differences in their conditions and circumstances.

3. The results of the present study had reflected the secondary school students’ achievement in science in Aligarh and Bulandshahar at a particular time. But these findings might be quite different at some other time or in other social-cultural settings.

4. The present study was conducted to find out the science achievement of private and government schools only. The students can also be categorized in more categories on the basis of management in schools.

5. The present study was limited only to find out the influence of various factors on the achievement in science. Other subjects (English, Hindi, Social Science and Mathematics) were not covered under this study.