Chapter-V

Summary, Findings and Recommendations
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SUMMARY, FINDINGS AND RECOMMENDATIONS

5.1 SUMMARY

Science is mirror of progress of any nation. Developed countries utilise knowledge of science in every possible way. Technology is reflected in every aspect of daily life in these countries. So science education must be on priority of government and educators. Science education is not a mere activity of memorisation of facts, formulas or equation. knowledge of science is necessary to be created within mind of learner . it can not be poured like water into brains of learners . so method for science teaching should be such type that it can originate knowledge and assimilate it with previous pertaining information. Method based and dependent upon memorisation and cramming can not be effective for teaching of science. Proper method for science teaching provides students for pleasant and interesting learning experiences.

Models of teaching are design or plan of activities done by students or teachers in classroom during teaching learning process. Models of teaching determine objectives of teaching before commencement of teaching and employ a specific procedure for realisation of these objectives. For teaching of science, model approach of teaching is emerged as one of most productive and successful teaching strategies.

Inquiry Training Model was developed by Richard suchman in 1962. This model is based on scientific method of problem solving. Students are led to construction of theory or concept by using their own cognitive skill. They are encountered to a discrepant event or puzzle and they ask question to teacher in order to solve that puzzle. Teacher replies in yes or no only. In this way students constructs their own knowledge.

This study was aimed to compare effect of Inquiry Training Model and conventional method of teaching on science achievement of secondary school students so that suitable and productive method for science teaching can be recognized.
5.1.1 Statement

“Comparative Study of Effect of Inquiry Training Model and Conventional Method of Teaching on Achievement in Science of Secondary School Students”

5.1.2 Objective

1. To develop teaching material of class IX to teach Science as per assumptions of Inquiry Training Model.

2. To find out the Significance of difference in science achievement scores of class IX students in experimental group and control group at pre-test stage.

3. To find out the effectiveness of conventional method of teaching on science achievement scores of class IX students in control group at pre-test stage and post-test stage.

4. To find out the effectiveness of Inquiry Training Model on science achievement scores of class IX students in experimental group Pre-test stage and post-test stage.

5. To find out the significance of difference in science achievement scores of class IX students in experimental group and control group at Post-test stage.

6. To find out the significance of difference in science achievement scores of male students of class IX in experimental group and control group at Post-test stage.

7. To find out the significance of difference in science achievement scores of female students of class IX experimental group and control group at Post-test stage.

8. To find out the significance of difference in science achievement scores of rural students of class IX in experimental group and control group at Post-test stage.

9. To find out the significance of difference in science achievement scores of urban students of class IX in experimental group and control group at Post-test stage.

5.1.3. Hypotheses

1. There is no significant difference in science achievement scores of class IX students in experimental group and control group at Pre-test stage.
2. There is no significant difference in science achievement scores of class IX students in control group at Pre-test stage and Post-test stage.

3. There is no significant difference in science achievement scores of class IX students in experimental group at Pre-test stage and Post-test stage.

4. There is no significant difference in science achievement scores of class IX students in experimental group and control group at Pre-test stage.

5. There is no significant difference in science achievement scores of male students of class IX in experimental group and control group at Post-test stage.

6. There is no significant difference in science achievement scores of female students of class IX experimental group and control group at Post-test stage.

7. There is no significant difference in science achievement scores of rural students of class IX in experimental group and control group at Post-test stage.

8. There is no significant difference in science achievement scores of urban students of class IX in experimental group and control group at Post-test stage.

5.1.4 Variables

**Independent variable** – teaching strategies.

Two types of teaching strategies were used in this study which are

1. Inquiry Training Model

2. Conventional method of teaching

**Dependent variable** – science achievement

**Moderator variable**- 1. Living place

2. gender

Living place had two levels-

1. Rural

2. Urban
Gender had two levels –

1. Male
2. Female

5.1.5 Population Population for this study consisted of IX grade students of Hindi medium schools (affiliated to U.P. Board of Secondary education) in Aligarh city.

5.1.6 Sampling

5.1.6.1 size a sample of 202 students was drawn from IX grade students of Hindi medium schools (affiliated to U.P. Board of Secondary education) in Aligarh city.

5.1.6.2 Sampling method - Multistage Random Sampling

5.1.6.3 Research design – Pre - test Post - test control group true experimental design

5.1.6.4 Statistical techniques – t test , mean , standard deviation

5.1.7 Data collection

Students in sample were divided in two groups- experimental group and control group. Students in sample were taught 3 units of science syllabus of IX class. Students in experimental group were taught through Inquiry Training Model and students in control group were taught through conventional method of teaching. A Pre - test and a Post - test was administered on both groups before and after teaching of each unit respectively. Questions in these tests were from content to be taught. Students of both groups were assessed with same questions on tests.

5.2 FINDINGS

After collecting data by 3 pre - tests and 3 post - tests, obtained scores were analysed and following findings were revealed –

1. There was no significant difference in science achievement scores of class IX students in experimental group and control group at Pre - test stage. Both groups were equivalent at Pre - test stage.
2. There was significant difference in science achievement scores of class IX students in control group at Pre - test stage and Post - test stage. Students of
control group were taught through conventional method of teaching and they improved their science achievement scores significantly at post stage with respect to their science achievement scores at Pre - test stage.

3. There was significant difference in science achievement scores of class IX students in experimental group at Pre - test stage and Post - test stage. Students of experimental group were taught through Inquiry Training Model of teaching and they improved their science achievement scores significantly at post stage with respect to their science achievement scores at Pre - test stage.

4. There was significant difference in science achievement scores of class IX students in experimental group and control group at Pre - test stage. Students of experimental group performed better than students of control group at Post - test stage. So Inquiry Training Model was found to be more effective than conventional method of teaching.

5. There was significant difference in science achievement scores of male students of class IX in experimental group and control group at Post - test stage. Male Students of experimental group were much better than male students of control group at Post - test stage of science achievement test.

6. There was significant difference in science achievement scores of female students of class IX in experimental group and control group at Post - test stage. Female Students of experimental group performed better than female students of control group at Post - test stage.

7. There was significant difference in science achievement scores of rural students of class IX in experimental group and control group at Post - test stage. Rural Students of experimental group achieved more score than rural students of control group at Post - test stage of science achievement test.

8. There was significant difference in science achievement scores of urban students of class IX in experimental group and control group at Post - test stage. urban Students of experimental group achieved more score than urban students of control group at Post - test stage of science achievement test.
5.3 CONCLUSIONS

1. Inquiry Training Model was found to have better effect on science achievement of secondary school students when it was compared with conventional method of teaching. Inquiry Training Model is an innovative teaching strategy and it was found successful. So this study concluded that Inquiry Training Model should be employed for teaching of science in classrooms.

2. Inquiry Training Model was equally effective for male and female students. Gender did not affect science achievement in study and gender did not have interaction with teaching strategies. So this study concluded that gender was not linked with effectiveness of teaching method. Same teaching strategies should be applied for both, male and female.

3. Rural and urban students were found to have equal effect of Inquiry Training Model. Living place did not interfere in effect of teaching strategies.

4. Conventional method of teaching was found inferior to an innovative teaching strategy. This reflects that there is a need to change whole system of science education.

5. Students performed well in this study when they got opportunity to construct their own knowledge. This study concluded that there is urgent need of implementation of student centred teaching methods.

6. Methods or strategies of teaching had significant effect on improvement of learners. So this study concluded that teaching method is important aspect of teaching learning process and can not be ignored.

5.4 EDUCATIONAL IMPLICATIONS

1. The study will enable teachers to make optimum use of Inquiry Training Model of teaching as effective strategy to make learning science interesting and fruitful activity. Students will attain learning experiences resulting into concepts.
2. It will enable teacher, counsellors and parents to make optimum use of models of teachings as teaching strategies to shape the positive attitudes of learners towards learning science and develop achievement motives in the learners.

3. In light of the findings of this study, curriculum developers will seek to develop an curriculum including model approach of teaching specially Inquiry Training Model.

4. The study will be of use for students to employ Inquiry Training Model of teaching as effective strategies to grasp and understand some complex concepts of science.

5. In light of the results of the study, schools will seek to shift their emphasis from passive answer absorbing (memorisation of facts) to active answer seeking (theory construction), from rigid daily programmes to flexible schedules of learning, from teacher centred classroom to child directed and group activities based classroom.

6. As shown from the results that learners respond differently to different or a variety of educational environments or classroom settings, contents remaining the same, teachers will be able to realize their role as an organizer of activities in classroom and responsibility for creating a model of cooperative social system and arousing interest for innovations in the field of teaching science.

7. The study will be of use for all those who want to keep pace with the scientific progress.

8. This study will be useful to improve aptitude and increase potential for research for students having interest in research and innovations in the field of teaching science.

9. This study shows that innovative methods of teaching are equally effective on rural students. Their background is not a barrier for them.

10. This study will be useful for educators for solving problem of limited resources. Inquiry Training Model guides how to use resources effectively with less number of supporting material.
5.5 RECOMMENDATIONS

1. State level academic bodies should take steps to raise the acknowledgement of educators by exposing them to extensive in-service training, conference or workshops. They should be allowed to attend the workshop, orientation courses, refresher courses, and seminars regularly so that they can be acquainted with innovative teaching methods.

2. Curricular materials based on Inquiry Training Model should be developed. Model approach of teaching should have proper place in curriculum.

3. Inquiry Training Model should be included in existing curriculum of the pre-service teacher training program so that teachers should be master in using effective strategy.

4. The outcome of research suggested that effectiveness in academic achievement is not influenced by the location of school, background of students and gender. Teaching methods should be irrespective of all these factors.

5. The curriculum should be so designed in such a way that sufficient time is allocated for the individual student in order to attain specific cognitive skills like inquiry and investigation.

6. Teaching material should be designed in light of possible responses by students.

7. Teaching session should give opportunities to students for interacting and building their own concepts. Inquiry Training Model helps them to verify these concepts.

8. Inquiry Training Model should not be used as supporting teaching method. Whole content of science syllabus should be taught by using Inquiry Training Model.

9. There should be endeavour for making teaching material based on Inquiry Training Model more interesting.
10. Students should be allowed to give suggestions for enhancement of inquiry sessions as responses of students lead teaching learning process in Inquiry Training Model.

5.6 SUGGESTIONS FOR FURTHER RESEARCH

1. Similar studies can be conducted on mastery of students in various scientific investigation skills by using Inquiry Training Model.

2. The replication of the study on a larger sample is needed to arrive at a more reliable and precise results.

3. Studies can be conducted on the achievement of learners of different age groups, and subjects.

4. Similar study can be conducted for effectiveness of the Inquiry Training Model and traditional method for the students of other levels like primary, Higher Secondary and university.

5. Effects of Inquiry Training Model based teaching material on some other cognitive and personality variables can be tested.

6. Effect of teaching material on affective and psychomotor aspects can be investigated.

7. Since, this study evaluated the effectiveness of Inquiry Training Model for teaching three units of science. It is suggested that teaching material can be prepared in all topics in science and effectiveness can be tested experimentally.

8. Since, this study was conducted for a period. Therefore further study would be required to determine what effects of Inquiry Training Model, if used for the entire one semester or for the entire session, would have on students’ achievement.

9. Effect of Inquiry Training Model can be compared with other innovative teaching strategies.

10. A detailed analysis of the practical difficulties likely to be encountered by teachers while using Inquiry Training Model can be conducted.

11. Similar experiment can be done with more variable.