CHAPTER V

SUMMARY OF FINDINGS, DISCUSSION OF FINDINGS, IMPLICATIONS
RECOMMENDATIONS AND SUGGESTIONS.

V. 1 Introduction

In the present study, the investigator analyzed the different factors affecting academic achievement of higher secondary students in chemistry in total and in different specifications such as knowledge, understanding, application and skill. In the first chapter, the investigator has given an introduction to the academic achievement and the factors affecting them. The second chapter deals with the review of related literature. In the third chapter, the investigator discusses the design of the study. The fourth chapter analyses the data which are given in tabular form and interpretations are also given. This chapter deals with the findings, discussions, educational implications, suggestions for further research and conclusion.

V. 2 Findings of the study

The finding of the study are discussed under five sections namely  (a) Academic Achievement (b) Students Factors affecting Academic Achievement (c) Institutional Factors affecting Academic Achievement (d) Family Factors affecting Academic Achievement (e) Teacher Factors affecting Academic Achievement.

V.2.a. Academic Achievement:

(i) The academic achievement of the majority of the higher secondary students in chemistry in total is moderate.

(ii) The academic achievement of the majority of the higher secondary students in chemistry is moderate in the specifications knowledge, understanding, application and skill.
V.2.b. Students Factors Affecting Academic Achievement:

(i) There is significant difference between the academic achievement of higher secondary boys and girls in chemistry in the specification ‘knowledge’. The mean scores show that the performance of boys is better than the performance of girls. However, the significant difference is not found between boys and girls in the total achievement and in the specifications, understanding, application and skill.

(ii) There is no significant difference between academic achievements of higher secondary Tamil medium students and English medium students in chemistry in total and in different specifications such as knowledge, understanding, application and skill.

(iii) There is significant positive correlation between the attitude of higher secondary students towards chemistry and their academic achievement in total and in different specifications such as knowledge, understanding, application and skill.

(iv) There is significant positive correlation between scientific aptitude of higher secondary students and their academic achievement in chemistry in total and in different specifications such as knowledge, understanding, application and skill.

(v) There is significant positive correlation between study habits of higher secondary students and their academic achievement in chemistry in total and in the specifications such as knowledge, understanding, and skill.

But the correlation between study habits of higher secondary students and their academic achievement in chemistry in the specification ‘application’ is found non–significant.

(vi) There is no significant difference among the higher secondary students of different ages in their academic achievement in chemistry in total and in different specifications such as knowledge, understanding, application and skill.
V.2.c. Institutional Factors Affecting Academic Achievement

i. There is significant difference among the higher secondary students from different types of school in the academic achievement in chemistry in total and in different specifications ‘knowledge’ and ‘skill’.

The post hoc tests show that the academic achievement of higher secondary students in chemistry in the specification ‘knowledge’ is more among the students of boys’ school than the students of girls’ school and co-education schools. In the specification ‘skill’, the achievement is more among the students of co-education schools than the students of boys schools and girls schools.

However, the significant difference is not found among the students from boys’ school girls’ school and co-education schools in their academic achievement in chemistry in total achievement and in the specifications, understanding and application.

ii. There is significant difference among the higher secondary students from different natures of institution in their academic achievement in chemistry in total and in different specifications such as knowledge, understanding, application and skill.

The post hoc tests show that the academic achievement of the higher secondary students of unaided schools is better than that of the students from government schools and government aided schools in chemistry in total and in the specifications knowledge, understanding, application and skill.

The students from government schools performed better than the students from aided school in the specifications ‘knowledge’ ‘understanding’ and ‘skill’. The aided schools students performed better than the government schools in the specification ‘application’.
iii. There is significant difference between the higher secondary students from urban schools and rural schools in their academic achievement in chemistry in total and in different specification such as knowledge, understanding, application and skill. The academic achievement of the students from urban school is found better than that of the students from rural school in chemistry in total and in the specifications knowledge, understanding, application and skill.

iv. There is significant positive correlation between the laboratory facilities available and utilization in the schools and the academic achievement of higher secondary students of these schools in chemistry in total and in different specification such as knowledge, understanding, application and skill.

V.2.d. Family Factors Affecting Academic Achievement

a. There is no significant difference between the higher secondary students of illiterate and literate fathers in their achievement in chemistry in total and in different specifications such as knowledge, understanding, application and skill.

ii. There is significant positive correlation between socio economic status and academic achievement of higher secondary students in chemistry in total and in different specifications such as knowledge, understanding, application and skill.

V.2.e. Teacher Factors Affecting Academic Achievement

a. There is no significant difference between gender of teachers and academic achievement of their higher secondary students in chemistry with respect to total academic achievement and in different specifications such as knowledge, understanding, application and skill.
ii. There is significant difference between teacher’s educational qualification and academic achievement of their higher secondary students in chemistry in total and in different specifications such as of knowledge, understanding, application and skill.

In all the cases, the students of the teachers whose qualification is M.Sc., M.Ed, showed better performance than the students of teachers with qualification M.Sc., B.Ed.

iii. There is significant difference in the academic achievement of higher secondary students of teachers with up to 2 years, 2 to 4 years and 4 and above years of experience in chemistry in total and in the specifications knowledge, understanding, application and skill.

The post hoc test shows that as experience of the teacher increases, the performance of the students in chemistry in total and in the specifications knowledge, understanding, application and skill increase.

iv. There is significant difference among the higher secondary students of teachers with up to 30 years, 31 to 36 years of age and 37 years and above age in their academic achievement in chemistry in total and in different specifications such as knowledge, understanding, application and skill.

The post hoc test shows that as age of the teachers increases, the performance of the students in chemistry in total and in the specifications knowledge, understanding, application and skill increases.

v. There is significant positive correlation between the teaching competency of the teacher and academic achievement of their students in chemistry in total and difference specifications such as knowledge, understanding, application and skill.

V. 3 Discussion of Findings
1. Majority of the higher secondary students (56.5%) are categorized as medium, academic achievers 34.25 of respondents are categorized as high, 9% of higher secondary students belong to low categories. The achievement of the majority of the sample is also moderate in the specifications such as knowledge (39.5), understanding (37%), application (42.75%) and skill (50%).

The percentage of achievement is found as 34.25 in total at high level and 29% in knowledge, 30.75% in understanding, 42.75% in application and 24.75% in skill level. This may be due to the reason that most of the sample are the first generation learners and they don’t have anybody at home to guide them and train them. The lowest percentage at skill level (24.75%) may be due to the memory oriented approach followed by the teachers.

2.a. Significant differences are not found in gender of higher secondary students in chemistry in total and in the specifications such as understanding, application and skill. This finding is in agreement with the finding of Banya Santoniono, K. (2004), Jacobs (2000), Dhakshinamoorthy, R. (2000), Ghosh, G.P. (1985), Karthikeyan, and Rasul (2003), Husniye Demircioglu Nilufer Norman (1999), Seeniammal V. (2007), Vigneswari M. (2000). But the above findings are different from the findings of Thangeswari.M (2000), Julia Gnanasundari Rebecca, (2006) Prem Kumari (2009), Suneetha, B. and Mayuri, K. (2001). At the same time, the performance of the boys is found to have better in the specification ‘knowledge’ than the girls. This may be due to the reason that the boys are normally selecting the easy questions which requires the skill of recall and recognition only.

b. Significant differences are found in medium of instruction (Tamil and English)
and academic achievement in chemistry in total and in different specifications such as knowledge, understanding, application and skill.

The academic performance of English medium students is found better than that of Tamil medium student in chemistry achievement at higher secondary level in total and in different specifications. This may be due to the fact that the family background of most of the English medium students are more conducive for them to study than the family background of Tamil medium students. This finding is in agreement with Dhakshinamoorthy, R. (2000), Seeniammal, V. (2007) and Vigneswari, M. (2000). But the above finding is different from the finding of Julia Gnanasundari Rebecca, (2006).

c. Significant positive correlations are found between academic achievement of higher secondary students in chemistry in total and different specifications such as knowledge, understanding, application and skill and their attitude towards chemistry. This may be due to the importance of mind sets in achieving anything. This finding is in agreement with finding of Mc Cune, Dianne Locke (1989), Karthikeyan and Rasul (2003), Husniye Demircioghi Nilvger Norman (1999), Sudhakar Jesubalan (2007), and Ahamad, N. Raheem, A. and Hasan, A. (2003). But the above finding is different from the finding of James, J. and Marice, P.V. (2004).

d. Significant positive correlations are found between scientific aptitudes of higher secondary students and their academic achievement in chemistry in total and in different specifications such as knowledge, understanding, application and skill. This shows the importance of scientific aptitude to the achievement of chemistry. The scientific aptitude is the base for the better understanding of the concept of chemistry. This finding is in agreement with findings of Sweetlin Leelavathy, (2007), and James, J. and Marice, P.V. (2004).

e. Significant positive correlations are found between study habits of higher
secondary students and their academic achievement in chemistry in total and in
different specifications such as knowledge, understanding and skill. Significant
correlation is not found between study habits of higher secondary students and
their academic achievement in chemistry in the specification of ‘application’. This
shows that the habit determines the achievement of the students. Non- significant
relationship between study habit and the achievement in the specification
‘application’ may be due to the fact that it is practice that only makes the students
understand practical application of the concept and not the theoretical knowledge.
This finding is in agreement with Gazi Mahabubul Alam (2010). But the above
findings are different from the finding of Suneetha, B. and Mayuri, K. (2001) and
Patricia Eria Onolemhemhen(2001).

f. Significant differences are not found among the higher secondary students of
different ages such as 17,18,19 in their academic achievement in chemistry in total
and in different specification such as knowledge, understanding, application and
skill. This may be because of the fact that the students of all ages may receive the
same kind of motivation from their parents and teachers. This finding different

3.a. Significant differences are found among academic achievement of the higher
secondary students from boys’ school, girls’ school and co-education school in
chemistry in total and in the specifications ‘knowledge’ and ‘skill’. The
achievement at knowledge level is more among the students from boys’ school and
in the skill level, the achievement is more among the students from co-education
school. This may be due to the fact that the boys formally prefer the questions
requiring the skill of recall and recognition and their interest in finding new may
make them score better in the specification ‘skill’ than their counter part from girls’

b. Significant differences are found among the academic achievement of higher secondary students from government schools, aided schools and unaided schools in chemistry in total and in different specifications such as knowledge, understanding, application and skill. The better achievement among the students from unaided schools in total and in all the specifications may be due to the coaching classes and result oriented practices given in these schools. They trained their students to sustain in the heavy competitions found among the un-aided schools to enroll more number of students. This finding is in agreement with findings of Karthikeyan and Rasul (2003), Vigneswari, M. (2000), Seeniammal, V. (2007) and Sudhakar Jesubalan (2007). But this finding is different from the findings of Julia Gnanasundari Rebecca, (2006) and Shrivastava and Preeti Singh (2006).

c. Significant differences are found among the academic achievement of the higher secondary students from urban schools and rural schools in chemistry in total and in different specifications such as knowledge, understanding, application and skill. The mean scores show that the chemistry achievement of urban students is better than rural students. This may be due to the awareness among the urban dwellers on the importance of higher secondary course which makes them coach their wards in all the possible ways. This finding is in agreement with the finding of Ghosh, G.P. (1985), Karthikeyan and Rasul (2003), Kumar Sanjeev, Amit Kumar

d. Significant positive correlations are found between the laboratory facilities available and utilization in the schools and the academic achievement of higher secondary students of these schools in chemistry in total and in different specification such as knowledge, understanding, application and skill. This shows that the availability and utilization of laboratory facilities in the schools enable the higher secondary students perform better in their theory exams because of hands on experience and the interest created by the practical work. This finding is in agreement with the findings of Dhakshinamoorthy, R. (2000), Karthikeyan and Rasul (2003), Julia Gnanasundari Rebecca, (2006) and Sudhakar Jesubalan (2007).

When compared to traditional approaches, the laboratory experiences produced more positive students outcomes in the areas of students achievement and attitudes. (Orehowsky, Walter (1999)).

4.a. Significant differences are not found between the higher secondary students of illiterate and literate father in their achievement in chemistry in total and in different specifications such as knowledge, understanding, application and skill. This may be because of the fact that the opportunity provided in the schools equate the children from both literate and illiterate fathers. This finding is in agreement with findings of Thangeswari, M. (2000). But this finding is different from the finding of Ghosh, G.P. (1985), Seeniammal, V. (2007), Prem Kumari (2009) and Vigneswari, M. (2000).

b. Significant positive correlations are found between socio-economic status and
academic achievement of higher secondary students in chemistry in total and in
different specifications such as knowledge, understanding, application and skill.
This finding is in agreement with findings of Ghash, G.P. (1985). This shows that
socio economic status of individual is an important factor affecting academic
achievement of the individual. (Husniye Demircioglu Nilufer Norman (1999),
Kumar Sanjeev, and Amit Kumar (2010), Seeniammal, V. (2007) Vigneswari, M.

5.a. Significant differences are not found between gender of teacher and academic
achievement of their higher secondary students in chemistry in total and in
different specifications such as knowledge, understanding, application and skill.
This may be because of the involvement and the work effecting shown by the
teachers irrespective of their gender. This finding is in agreement with finding of

b. Significant differences are found between teachers’ educational qualification and
academic achievement higher secondary students in chemistry in total and in
different specification of knowledge, understanding, application and skill. In all
the cases, the students of the teachers whose qualification is M.Sc., M.Ed.,
showed better prospect than teachers with qualification M.Sc., B.Ed. This may be
due to the fact that master degree in education enables the teachers to improve the
academic achievement of their students. This finding is in agreement with finding

c. Significant differences are found between teachers experience and academic
achievement of higher secondary students in chemistry in total and in different specifications such as knowledge, understanding, application and skill. Total academic achievement level of higher secondary students whose teachers experience is above 4 years is found to be better. This may be because of the reason that the experience makes men perfect. The experience the teachers accumulated every year helps them to improve the academic achievement of their students. This finding is in agreement with finding of Pushpam, L.M.A. and Soundararajan, R. (2004).

d. Significant differences are found between teachers age and academic achievement of higher secondary students in chemistry in total and in different specifications such as knowledge, understanding, application and skill. As the age of the teacher increases the academic achievement of their students also increases. It has been said that the age gives the person both experience and wisdom. The aged people working in the schools do not have any higher ambition. This nature makes the people work hard and with more dedication. The academic achievement of the students of these teachers ultimately increases. This finding is in agreement with the finding of Pushpam, L.M.A. and Soundararajan, R. (2004).

e. Significant positive correlation is found between the teaching competency of the teachers and academic achievement of their students in chemistry in total and in different specifications such as knowledge, understanding, application and skill. It is clear from this finding that the teaching competency determines academic achievement of the students at all levels. This finding is in agreement with finding of Pushpam, L.M.A., Soundararajan, R. (2004) and Rao, P.M. (2002).
V. 4. Educational Implications and Recommendations of the Study

1.a. The academic achievement of higher secondary students in chemistry is moderate (56.5%). Only 9% of the respondents falls under low category. The teacher can take same unique step to improve students’ academic achievement in total and in different specification such as knowledge understanding, application and skill. Only 34.25% of the sample comes under high category.

It is, therefore, recommended that the students should be made to have mastery level of learning. The parents are to be sensitized the importance of academic achievement at higher secondary level. The teachers should be trained to improve the academic achievement of their students.

Some counseling programmes are to be arranged in the needy institution on the strategies of improving academic achievement.

2.a. The academic achievement in the specifications ‘knowledge’ and ‘skill’ is found less among the higher secondary girls students than their male counterpart.

It is, therefore, recommended that the girl children may be trained in memory skills and given the project related to the concept studied in the classroom so that they can recall and recognize (knowledge) and contribute something (skill) for the subject they study.

The parents may also allow the girl children to participate in all the activities both inside and outside the school.

b. The achievement of English medium students in chemistry is found to be better than Tamil medium students in this study.

It is, therefore, recommended that the special coaching classes may be conducted for Tamil medium students. The teacher handling these classes is to be
made aware of the special technique meant for Tamil medium students. The separate and special reference and study materials on higher secondary chemistry in Tamil for both teachers and students may be developed.

c. The significant positive correlation between the attitude towards chemistry and achievement in chemistry is found in this study.

   It is, therefore, recommended that the students are to be made to love their subject so that their achievement could be better. The subject related entertainment activities may be designed and taught. The students also may be involved in this task.

d. Scientific aptitude is found have significant positive correlation with the academic achievement in chemistry.

   It is, therefore, recommended that the basic concepts of science taught at lower levels should be kept in students memory by various activities like organizing exhibition, science quiz, the project work etc. An attempt should be made to make the students, understanding the uniformity of different concepts in the various branches of science.

e. The significant positive correlation is found between the study habit and the academic achievement of higher secondary students in chemistry.

   It is, therefore, recommended that the efforts should be made to improve the study habit of higher secondary students. The action researches on developing study habit with different technique can be undertaken so that immediate solutions could be found. This ultimately improves the academic achievement of higher secondary students in chemistry.

3.a. The academic achievement of the students from the boys’ schools is found better
in the specifications ‘knowledge’ and form the co-education school in the specification ‘skill’.

It is, therefore, recommended that the reasons may be found out and the necessary steps are to be taken.

b. The academic achievements in unaided school and urban schools are found better than the ‘government’ and aided schools’ and rural schools respectively.

It is, therefore, recommended that the survey may be conducted to know the reasons and strategies followed in unaided schools and urban schools for the better academic achievement. The attempts should be made to follow the same strategies with necessary modifications to improve the academic achievement of the students from government and aided schools and urban schools.

b. The availability and utilization of laboratory facilities are significantly and positively correlated with the academic achievement of higher secondary students in chemistry.

It is, therefore, recommended that the laboratory of the school should be properly equipped and utilized. The periodical and effective supervision are also recommended in this regard.

4.a. It is found in this study that there is no significant difference between the educational qualification of parents and the academic achievement of their children.

It is, therefore, recommended that the interview for the parents need not be conducted in the schools for giving admission to their wards.

b. The significant positive correlation is found between the academic achievement of higher secondary students and then socio-economic conditions of their families.
It is, therefore, recommended that the children coming from the families of low socio-economic status may be made at par with their counterparts.

The motivation and counseling, provision of scholarship, free coaching classes, extension of moon-meal scheme for the breakfast, etc. are recommended.

5.a. The teachers’ master degree in education is found to have effect on their students’ academic achievement in chemistry.

It is, therefore, recommended that the higher secondary teachers may be compelled to study master degree in education. The provision should be made at all levels.

b. The students of the teachers with more age and experience are found to have better academic achievement.

It is, therefore, recommended that the expertise of the aged and experienced teachers may be utilized for training the young, and the teachers with less experience.

c. The teaching competency of the teacher is found to have impact on the academic achievement of higher secondary students in chemistry.

It is, therefore, recommended that the competency of the teachers are to be improved through various in service programmes. The teachers with better competency may be identified and acknowledged to create the healthy competitive spirit among the teachers.
V.4.a. Recommendations for Policy Making

Based on the findings of the present study, the following recommendations are given to be considered for policy making.

a. The separate time – table may be suggested by the authority for the rural and Tamil medium schools giving provision for coaching classes.

b. M.Ed., degree may be made as mandatory for the appointment of higher secondary teachers along with the post graduate degree in their concerned subject. The incentives given now for the M.Ed., may be included in the pay scale itself. The permission with on duty facilities may be given for the post-graduate teachers appointed so far instead of leave on private affairs to pursue M.Ed course. This provision motivates the post graduate teachers and ultimately improves the academic achievement of the students.

c. An hour may be allotted, at least, once in a week in the time- table for developing study – habit because its correlation with academic achievement is found significantly positive.

d. The modalities of evaluating teaching competency have to be prepared and the teachers have to be evaluated periodically. The teaching competency of the teachers may be taken for an account for further elevation of teachers.

V. 5 Suggestion for further Studies

a. The few factors affecting academic achievement of chemistry are studied in this study.

It is, therefore, suggested that the studies may be undertaken to find out some other factors like society, mass – media, government policy, etc. determining the academic achievement.
b. The higher secondary level and chemistry subjects only are taken for this study.

   It is, therefore, suggested that the factors affecting the achievement of different subjects, and at different levels may be undertaken.

c. The different factors affecting academic achievement are taken for this study as a whole.

   However, it is suggested that the factors such as attitude, aptitude, study habit, lab facilities, teachers’ competencies, etc. may be studied separately and still more deeply.

d. 400 students and 40 teacher’s from Ramanathapuram only are taken as the sample in this study.

   It is, therefore, suggested that the same study may be undertaken for some other sample.

e. The factors affecting academic achievement are studied in this study.

   It is, therefore, suggested that the factors affecting, non-scholastic list achievement of the students may be studied.

f. Some reasons for the findings are given in this study based on the researchers experience and point of view. They are speculative.

   It is, therefore, suggested that genuineness of these reasons may be studied scientifically.

V. 6 Conclusion

   The factors affecting academic achievement of chemistry at higher secondary level are studied in this study. The importance of chemistry has also been discussed in detail. There has been a positive correlation between the academic status and country’s status throughout the world. This study, in this regard, contributes something serves as the eye-opener for the betterment of academic progress and ultimately for the country’s progress.