Chapter - VI

SUMMARY, FINDINGS, CONCLUSIONS
RECOMMENDATIONS AND
SUGGESTIONS
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SUMMARY, FINDINGS, CONCLUSIONS, RECOMMENDATIONS AND SUGGESTIONS

This chapter deals with the summary, major findings, conclusions, recommendations and suggestions for further research.

6.1 SUMMARY

Mathematics plays a very important role in the life of all human beings. Everybody needs the knowledge of mathematics in one way or other. Importance of mathematics is very clear, from its wide applications ranging from daily uses of even a common man, to its applications for the development of science, Engineering and Technology and even social sciences including languages. Former president of India A.P.J. Abdul Kalam called upon the Universities to turnout a global cadre of skilled professionals in Science and Technology to make India to realize its dreams of a developed nation by 2020. Mathematics plays a key role for the development of Science and Technology. National education commission observed "proper foundation in the knowledge of the subject should be laid down at the school level itself".

The achievement in mathematics is related to various factors. The present investigation is to find out the relationship between achievement in mathematics of 10th class students and various socio-demographic and Psychological variables.

6.1.1 Introduction

Education is found to be an effective tool to bring the required changes in the society. The National Education Commission (1964-66) has emphasized that education is the one and only instrument that can be used to bring about a change towards the social and economic betterment of India. Further the commission quoted "India is now being shaped in her class
rooms”. It is not only a saying but also a reality. In the world, based on Science and Technology, it is the education that determines the level of prosperity, welfare and security of the people.

The present day modern world is witnessed with unprecedented growth of Science and Technology and the life style of the people has been constantly changing accordingly. Mathematics can be considered as the back-bone for the development of Science and Technology. Mathematics plays a very important role in the development of the country. Napoleon said “the progress and improvement of mathematics are linked to the prosperity of the state”.

In view of the important role that Mathematics plays in the modern world, it has been imperative for any nation or the world to promote mathematics education, in their respective countries. It is not possible for us to expect improved mathematics education, in the higher education, unless, we succeed in providing a sound mathematics education at the school level.

Secondary education has been considered as the weakest link between lower and higher education levels, in view of the low standards and more failures and dropouts after the secondary level of education. In this aspect, an achievement of the students in all the subjects is the most significant factor, in educational system. Among the different areas of research in education, academic achievement, is one of the most extensively investigated phenomena. The standards of education at schools and colleges would be reflected by the performance of pupils in their academic subjects. Academic achievement is the main concern of our educationists and the government. Achievement of the students, depends upon several Sociological, Psychological and environmental aspects. This fact was established by several investigations, in our country and aboard. The present study is aimed at establishing a meaningful relationship between achievement in mathematics and various psychological and demographical variables.
6.1.2 Statement of the Problem

The present study is concerned with the scholastic achievement of 10th class students in mathematics. It examines the main effect of management, sex and their interaction effect on the scholastic achievement. It also examines the main effects of locality, caste and their interaction effect on the achievement. It establishes the relationship between the scholastic achievement and other variables, personality factors, study habits and self-concepts. It also predicts the scholastic achievement with the help of different sets of psycho-sociological variables.

6.1.3 Title of the Problem

The title of the problem is “Achievement of 10th class Students in Mathematics in relation to Certain Psycho-Sociological Variables”.

6.1.4 Scope of the study

The main intention of the study is to find the relation of scholastic achievement of 10th class-students with socio-demographic variables, personality factors, study habits and self-concepts. The marks obtained in an objective test, in mathematics are taken as scholastic achievement in mathematics which is regarded as dependent variable in the present study. The objective achievement test is developed and standardized by the investigator. The socio-demographic variables personality factors, study habits and self concepts are measured by using the relevant instruments. The study is confined to, only 22 schools of Chittoor District, under the managements of Zillaparishad, Government, Municipalities, A.P. Social Welfare Department and Private.

As already described in the earlier chapters, only a few variables have been included in this study. A number of factors will have their impact on the achievement, in mathematics. Each and every variable having its influence on the achievement could not be included in this study.
The study also attempts to predict the scholastic achievement with the help of different sets of psycho-sociological variables.

6.1.5 Need for the study

In one's life, the intellectual capacities and capabilities are assessed by his/her achievements in various subjects. In the present educational system, the various programmes are not confined, only to the text books. Using of libraries and laboratories for additional information, making arrangements for work-shops, seminars, various competitions, have come into school life. The unprecedented expansion of educational system, the enormous financial investments, made in educating the children, by individuals and governments, and the need to point out the priorities of educational expenditure, necessitate the identification of various factors, contributing most, for student learning and achievement levels. The achievement in various subjects, of learners, is the result of combined efforts of teachers, parents, managements of schools and students. Again there is an effect of various Psycho-sociological factors, on the achievement of students.

There is an urgent educational and social need to study and identify the influence of various factors, on the achievement of high school pupils, to draw up the conclusions for high/low achievements.

Scholastic achievement, continues to be one of the most important variables, held in high esteem in all cultures, countries and times. Hence the research related to the area of academic achievement, is ever growing concern of the researchers, educationists and educational administrators.

In the present day, education is viewed seriously that there is every need to raise the standards of the pupils at all levels. A concerted effort is to be made to identify some of the significant socio-psychological factors that influence the academic achievement of the student and to explain the contribution of these factors.
An interesting feature observed is that majority of the studies in the area of scholastic achievement were confined to the simple correlational analysis between predictors and criterion variables. Individual and cumulative effects of several independent variables on the scholastic achievement could be assessed more accurately by employing regression analysis. Therefore the main aim of the present study is to identify, the influence of independent factors and to predict the multiple effect of independent factors on the achievement of 10th class students, in mathematics, with the help of various socio-psychological factors and further to suggest suitable regression equations, in the prediction of scholastic achievement. The study also aims at making some recommendations for further study in the field and some suggestions for teachers.

The above crucial conditions lead the investigator to make an attempt in this area of scholastic achievement of 10th class pupils in mathematics in relation to certain psycho-sociological factors.

6.1.6 Objectives of the study

The following are the objectives of the study.

1. To understand the present status of 10th class students with regard to their achievement in mathematics.

2. To study the impact of management and sex and their interaction effect on the scholastic achievement.

3. To study the impact of locality and caste their interaction effect on the scholastic achievement.

4. To study the influence of socio-demographic variables on the scholastic achievement.

5. To study the impact of personality factors on the scholastic achievement of 10th class students in mathematics.
6. To study the impact of self-concepts on the scholastic achievement of 10th class students in mathematics.

7. To predict the scholastic achievement of 10th class students in mathematics, with the help of socio-demographic variables, personality factors, study habits and self-concepts.

8. To predict the scholastic achievement of 10th class students in mathematics, with the help of all the independent variables in the investigation.

9. To develop mathematical equations for predicting the scholastic achievement of 10th class students in mathematics.

10. To summarize the findings of the present investigation.

11. To make appropriate recommendations on the basis of present findings.

12. To provide suggestions for further research.

6.1.7 Hypotheses to be tested

In the light of the above objectives, the following major null hypotheses have been formulated for the purpose of investigation.

1. All the 10th class students would not have the same scholastic achievement abilities in mathematics.

2. Management, sex and their interaction would not have significant influence on the scholastic achievement of 10th class students in mathematics.

3. Locality, caste and their interaction would not have significant influence on the scholastic achievement of 10th class-students in mathematics.

4. Socio-Demographic variables would not have any significant influence on the scholastic achievement of 10th class students in mathematics.
5. Personality factors would not have any significant influence on the scholastic achievement of 10th class students in mathematics.

6. Study habits would not have any significant impact on the scholastic achievement of 10th class students in mathematics.

7. Self-concepts would not have any significant impact on the scholastic achievement of 10th class students in mathematics.

8. It would not be possible to predict the scholastic achievement with the help of all independent variables.

9. It would not be possible to develop mathematical equations with the help of different sets of independent variables.

6.1.8 Variables Included in the study

The review of related literature in the field of scholastic achievement reveals the fact that the scholastic achievement of students has been influenced by a number of psycho-sociological variables. Hence the following psycho-sociological variables are included in the study.

A. Dependent Variables

Achievement in objective Achievement Test (OAT) consisting of 100 multiple choice questions.

B. Independent Variables

I. Socio-Demographic Variables (1-19)

1. Management of the School

2. Gender

3. Locality

4. Age

5. Caste
6. Birth order
7. Number of members in the family
8. Mother's education
9. Father's education
10. Mother's occupation
11. Father's occupation
12. Religion
13. Income of the family
14. Economic Status
15. Separate room for study
16. Study hours at Home
17. Help from family members
18. Works at home
19. Time spent for mathematics

II. Personality Factors HSPQ (20-33)

20. Factor-A
21. Factor-B
22. Factor-C
23. Factor-D
24. Factor-E
25. Factor-F
26. Factor-G
27. Factor-H
28. Factor-I
29. Factor-J
30. Factor-O
31. Factor-Q₂
32. Factor-Q₃
33. Factor-Q₄

III. Study Habits (34-41)

34. Home environment for study
35. Reading and note taking
36. Planning for reading subjects
37. Habits of concentration
38. Preparations for examinations
39. General Habits and attitudes
40. School Environment
41. Study Habits total score

IV. Self-Concepts (42-52)

42. Health and sex Appropriateness
43. Abilities
44. Self-confidence
45. Self-acceptance
46. Worthiness
47. Self-Concepts about present, past, future
48. Beliefs and convictions
49. Feelings of shame and guilt.

50. Sociability

51. Emotional Maturity

52. Self-concepts total score

6.1.9 Research Tools

1. The investigator has developed Objective Achievement Test (OAT) and standardized to measure the achievement in mathematics of 10th class students.

2. Cattle’s 14 personality factors, Form-A (HSPQ) is adopted to measure the personality traits of the students.

3. Study-Habits inventory developed and standardized by Dr B.V.Patel, is adopted to study the influence of study habits of the pupils on the dependent variable, (Achievement in mathematics).

4. Dr (Miss) Mukta Rani Rastogi’s (1974) self-concept scale is adopted to measure the self-concepts of the students.

5. Personal Data Questionnaire is developed by the investigator with the help of experts in the field of education, to measure the socio-economic and demographic variables.

6.1.10 Sample Selected

For the present study, the sample consisting of 22 schools under different managements namely Zillaparishad, Government, Municipalities, A.P Social welfare Department and private management have been selected. Geographically the Chittoor District is divided into four revenue divisions, namely Madanapally, Tirupati, Chittoor and Palamaner. Keeping in view the number of schools, existing in each revenue division, ten Zillaparishad high schools, three Government high schools, three Municipal High Schools, three Andhra Pradesh Social Welfare Residential Schools and three private unaided
schools under different managements are selected. The sample selected consists of 650 boys and 794 girls (N=1444)

6.1.11 Collection of Data

The investigator personally visited all the schools selected for the study and explained the heads of the institutions, the purpose of collecting the data. The students were given necessary instructions and motivated to respond genuinely. Advance intimation about the visit of the investigator was provided to the Head Master and the students. The students, who attended the schools, on the days of collecting data are considered for the purpose of investigation. All the necessary data was collected with the help of the data gathering instruments and teachers of the concerned schools.

6.1.12 Scoring and Analysis

1. The objective achievement test consists of one hundred multiple choice questions and each correct response is awarded with one mark.

2. For the 14.PF personality questionnaire, the scoring key prepared by the author is employed.

3. The study habits inventory is scored on a five point scale by giving weightages 5,4,3,2 and 1, for positive items and 1, 2, 3, 4, and 5 for negative items to the five alternatives; always, often, some times, rarely and never respectively. The self concept scale is scored in a similar manner to the five alternatives strongly agree, agree, undecided, disagree and strongly disagree.

   The total scores for each area of respective inventories are entered and grand total is obtained by adding all the weightages, on all the statements and marked them on the top right corner of the inventory.

4. The information furnished by the students on socio-demographic variables is numerically coded in order to suit for the computer analysis.
The analysis is carried out on the basis of objectives of the study and hypotheses formulated, by employing appropriate statistical techniques.

Frequency distribution tables are prepared for the total sample, for different types of schools, for boys and girls, for different localities and different castes.

Measures of central tendency, measures of dispersion, skewness, Kurtosis, coefficient of variation and standard error of mean, are computed and used wherever necessary.

The inferential Statistical Techniques ‘t’ test and ‘F’ test are employed to test the different hypotheses. Multiple ‘R’ is computed for carrying out stepwise regression analysis, for predicting the scholastic achievement with the help of different sets of independent variables. The services of S.V. University computer centre are also utilized.

The levels of significance employed with respective symbols are given below.

** Indicates significant at 0.01 level
* indicates significant at 0.05 level
@ indicates not significant at 0.05 level

6.2 MAJOR FINDINGS OF THE STUDY

The statistical analysis of the data reveals the following broad findings of the investigation.

A. Distribution characteristics of scholastic achievements scores.

1. The mean scholastic achievement score of 10th class students in mathematics for the whole group is 44.97. Hence the performance of the students is poor. Median is 41.00 and mode is 33.06. Hence the distribution is not normal. It is more peaked than the normal distribution.
1. The values of skewness and Kurtosis are 0.82 and 3.39 respectively. Hence the distribution of the scholastic achievement scores for the total sample is positively skewed and leptokurtic.

2. It is found that the mean scholastic achievement score for the pupils of private schools is the highest (53.78) among all the groups viz (i) whole groups (ii) Zilla Parishad schools (iii) Government Schools (iv) Municipal Schools (v) A.P. Social welfare Residential schools (vi) Private schools (vii) males (viii) females (ix) rural (x) semi urban (xi) urban (xii) schedule caste/ tribes (xiii) Backward castes and (xiv) other castes. The mean scholastic achievement score for the students of government schools is the least (38.10), as compared with other groups. The performance of males (46.31) is better than that of females (43.86). It is also observed that the rural pupils' performance (47.26) is better than semi urban (44.39) and urban (43.63). The performance of the urban students is the least (43.63). Also it is noticed that the performance of O.C. students (46.81) is better than S.C/ST (44.54) and BC (44.00) students. For all the distributions, the value of skewness is positive. Hence all the distributions are positively skewed. The values of kurtosis for A.P. Social Welfare Residential School students (2.58) and private school students (2.30) are less than 3.00. Hence these two distributions are leptokurtic. The value of kurtosis for OC students is 3.00. Hence the distribution for OC students is mesokurtic and all the remaining distributions are platykurtic.

B. Factorial Designs

4. There is a significant influence of 'Management' on the scholastic achievement of 10th class students in mathematics at 0.01 level of significance.
5. Sex has no significant influence at 0.05 level, on the scholastic achievement of 10th class students in mathematics.

6. There is, significant interaction effect of management and sex at 0.01 level, on the scholastic achievement of 10th class students.

7. 'Locality' has significant influence at 0.05 level on the scholastic achievement of 10th class students in mathematics.

8. The variable 'caste' has significant influence at 0.05 level on the scholastic achievement of 10th class students.

9. There is significant interaction effect of locality and caste at 0.01 level on the scholastic achievement of 10th class students in mathematics.

C. Influence of Socio-Demographic and Personal variables

10. 'Age' has no significant influence at 0.05 level on the scholastic achievement of 10th class pupils in mathematics.

11. 'Birth order' has no significant influence at 0.05 level on the scholastic achievement of 10th class students in mathematics.

12. 'Number of members in the family' has no significant influence at 0.05 level on the scholastic achievement of 10th class students in mathematics.

13. Mother's education has significant influence at 0.01 level, on the scholastic achievement of 10th class students in mathematics.

14. Father's education has significant influence at 0.01 level, on the achievement of 10th class students in mathematics.

15. Mother's occupation has significant influence at 0.01 level on the scholastic achievement of 10th class students in mathematics.

16. 'Father's occupation' has significant influence at 0.01 level on the scholastic achievement of 10th class students in mathematics.
17. Religion has significant influence at 0.01 level on the scholastic achievement of 10th class students in mathematics.

18. ‘Annual income of the family’ has significant influence at 0.01 level on the scholastic achievement of 10th class students in mathematics. Better the income, better is the academic achievement.

19. ‘Economic status of the family’ has significant influence at 0.01 level on the scholastic achievement of 10th class students.

20. It is observed that ‘separate study Room’ has significant influence at 0.05 level on the scholastic achievement in mathematics. Students with separate study room will have better achievement.

21. ‘Study Hours at Home’ has significant influence at 0.01 level on the scholastic achievement of 10th class students in mathematics. It is clear that more the number of study hours, at home, better is the scholastic achievement.

22. ‘Help from the family members’ has no significant influence at 0.05 level on the scholastic achievement of 10th class students.

23. ‘Works at home’ has significant influence at 0.05 on the scholastic achievement of 10th class students in mathematics. Hence more the works at home, less would be the achievement in mathematics.

24. ‘Time spent for mathematics daily’ has no significant influence on the achievement of 10th class students in mathematics. Hence it is clear that the time spent on mathematics, is not the criterion for better achievement. Better achievement in mathematics may depend upon so many other factors, like interest, attitude, intelligence etc.

D. Influence of Personality Factors (HSPQ)

25. It is found that students who are having personality characteristics of (i) More intelligent (ii) Emotionally stable (iii) Obedient (iv) Super-
ego strength (v) venturesome (vi) Tense – minded (vii) placid and (viii) controlled have significantly better scholastic achievement in mathematics than the students who are having the personality characteristics of (i) Less intelligent (ii) Emotionally less stable (iii) Assertive (iv) Moral standards (v) Shy (vi) Though minded (vii) Apprehensive and (viii) Undisciplined

The remaining personality factors do not have significant influence on the scholastic achievement in mathematics.

E. Influence of Study Habits

26. It is found that the students, who have better study habits achieved significantly better in mathematics. Therefore ‘Study habits’ have significant influence on the achievement of 10th class students in mathematics. Developing proper study habits is desirable.

F. Influence of Self-Concepts

27. It is found that self-concepts like (i) Abilities (SC₂), (ii) Self confidence (SC₃), (iii) Self Acceptance (SC₄), (iv) Worthiness (SC₅), (v) present-past-future (SC₆), (vi) Beliefs and convictions (SC₇), (vii) Feelings of Shame and Guilt (SC₈), (viii) Emotional Maturity (SC₁₀) and (ix) Self-concepts total score (SC₇), have significant influence on the achievement of 10th class students in mathematics.

28. The areas of self-concepts namely

(i) Health and sex appropriateness (SC₁) and

(ii) Sociability (SC₉) do not have significant influence on the achievement of 10th class students in mathematics.
G. Step-Wise Multiple Regression Analysis

29. It is found that the best regression equations for predicting the scholastic achievement in mathematics of 10th class students are;

i) With the help of 19 socio-demographic variables

\[
ATS = 3863 + 2.862 \times (ME) + 3.596 \times (SHH) + 4.644 \times (M) - 8.198 \times (L) + 2.521 \times (F0) - 1.502 \times (TSM).
\]

The variance explained with the help of the above 6 variables is 13.80 per cent.

ii) With the help of 14 personality factors.

\[
ATS = 14.96 + 2.036 \times (FB) + 0.466 \times (FG) + 0.486 \times (FI) + 0.335 \times (FQ3) + 0.338 \times (FH) - 0.245 \times (FO)
\]

The variance explained with the help of the above 6 variables is 11.26.

(iii) With the help of 7 areas of study habits.

\[
ATS = -4.36 + 0.231 \times (SH7) + 0.680 \times (SH5) + 0.324 \times (SH4+) + 0.186 \times (SH7)
\]

The variance explained with the help of the above 4 variables is 15.14 per cent.

(iv) With the help of 10 areas of self-concept scale.

\[
ATS = 4.02 + 0.330 \times (SC7) + 0.219 \times (SC2) - 0.356 \times (SCg) - 0.296 \times (SC1) - 0.305 \times (SC5) - 0.310 \times (SC6)
\]

The variance explained with the help of the above 6 variables is 7.87 per cent.
(V) With the help of all independent variables in the study

\[ ATS = -22.75 + 0.168 (\text{SHT}) + 1.415 (\text{FB}) + 0.513 (\text{SHS}) + 5.932 (I) - 6.983 (L) + 3.489 (M) + 0.451 (\text{FI}) + 1.878 (\text{SHH}) + 0.084 (\text{SC}_{\text{T}}) \]

With the help of the above nine variables, it is possible to explain 27.6 per cent of variance in the dependent variable.

It is concluded that the achievement in mathematics could be best predicted with the help of (i) study habits total scores (ii) Personality Factor-B (iii) Preparation for examinations (iv) Income of the family, (v) Locality (vi) Management of the school, (vii) Personality Factor-I, (viii) study hours at home and (ix) self concepts total score.

30. A model of relationship between independent variables and dependent variables is shown in Fig.10.

![Fig. 10: Model of Relationship between independent and dependent variables](image-url)
6.3 CONCLUSIONS

On the basis of the findings in the preceding pages, the following conclusions are drawn:

1. The frequency distributions of the scholastic achievement of 10th class students for the whole group is not normal. It is more peaked than the normal distributions.

2. All the 10th students do not have the same scholastic achievement abilities.

3. There is a significant influence of ‘Management’ on the scholastic achievement of 10th class students in mathematics.

4. ‘Sex’ has no significant influence on the scholastic achievement of 10th class students in mathematics.

5. There is significant interaction effect of management and sex on the scholastic achievement of 10th class students in mathematics.

6. ‘Locality’ and ‘Caste’ have significant influence on the scholastic achievement of 10th class students in mathematics.

7. There is significant interaction effect of ‘Locality’ and ‘Caste’ on the scholastic achievement of 10th class students in mathematics.

8. The socio-demographic and personal variables viz: (i) Mother’s education, ii) Father’s education, iii) Mother’s occupation, iv) Father’s occupation, v) Religion, vi) Annual income of the family, vii) Economic status, viii) Separate Room for study, ix) study hours at home and x) works at home have significant influence on the scholastic achievement of 10th class students in mathematics.

9. The following socio-demographic and personal variables, viz; i) Age, ii) Birth order, iii) Number of members in the family, iv) Help from
family members and v) Time spent for mathematics, do not have significant influence on the scholastic achievement of 10th class students in mathematics.

10. The personality Factors B, C, E, G, H, I, O and Q have significant influence on the achievement of 10th class students in mathematics.

The personality factors namely A, D, F, J, Q2, and Q4, do not have impact on the scholastic achievement of 10th class students in mathematics.

11. All the seven areas of SHI and the total score of SHI have significant influence on the scholastic achievement of 10th class students in mathematics. Better study habits, is associated with better scholastic achievement of 10th class students in mathematics.


13. It is possible to predict the scholastic achievement of 10th class students in mathematics, with help of different sets of independent variables.

14. It is possible to develop, the regression equations for predicting the achievement in mathematics of 10th class students with the help of different sets of independent variables.
6.4 EDUCATIONAL IMPLICATIONS AND RECOMMENDATIONS

After analyzing the results of the study carefully, the following implications can be drawn. It is seen from the study that the general performance in mathematics of 10th class pupils is poor viz below fifty percent. Mathematics plays a crucial role in the life of students. To improve the achievement in mathematics at 10th class level, efficient, dedicated, honest and committed teachers of mathematics are to be recruited. Plans are to be made to design more Para-mathematical activities, as curricular inputs, to eliminate the fear of mathematics in children. The knowledge of mathematics at secondary level forms the basis for mathematics at higher education and hence combined efforts by mathematics teachers, parents, educational administrators, inspecting authorities and government, may be made for ensuring the quality of school mathematics for all the children up to the collective level (say 10th class). Special programmes such as providing additional information, encouragement to participate in competitive tests and providing suitable study material etc may be taken to safeguard the interests of those students, who want to specialize, in the area of mathematics and related branches. The teachers in general should possess the knowledge of results of research findings. They must know which of the psychosociological factors that influence the achievement in mathematics and act accordingly to improve the achievement in mathematics.

On the basis of the results of this investigation, the following recommendations are made.

1. As the achievement in mathematics of 10th class students is very poor in government, Municipal and Zillaparishad schools, special attention should be paid to improve the achievement in mathematics by parents, teachers, managements, administrators and Government.
2. Proper positive attitude towards the subject must be laid down by the concerned teachers. Without positive attitude, it is rather difficult to raise the standards.

3. Fear of the subject, test-anxiety and tension should be removed by proper counselling and guidance by the teachers.

4. Pupils must be made aware of the importance of the subject, uses of the subject in daily life, its correlation with other subjects and thereby interest in the subject must be aroused by the teachers.

5. More importance is to be given for making the concepts in the subject clear, understanding of the formulae and applying the formulae.

6. Pupils must be encouraged to solve at least fifty percent of the problems in each topic and in each exercise.

7. Sufficient number of oral questions on the subject are to be put and answers may be elicited from the pupils, while teaching.

8. More number of tests, with objective questions namely multiple choice, filling up the blanks, matching type and true or false, are to be conducted.

9. Special training must be given to the students to face different competitive examinations and the students must properly be encouraged to face such examinations.

10. It is observed that the performance of the students belonging to the government schools is very less. This may be due to the vacant post of mathematics teachers, lack of proper supervision, lack of commitment on the part of the teachers and lack of proper infrastructural facilities in the schools. Parents, teachers, administrators and government have to put up a combined effort to raise the standards in government schools, thereby creating confidence among the parents and avoiding
mad rush for private schools. More competitive, highly qualified and
dedicated teachers are to be recruited for the post of mathematics
teachers in Government Schools.

11. It is observed from this study that the performance of rural students is
some what better than semi urban and urban students. This may be
due to lack of proper study habits and wasting of time in other
activities than studies by students of urban and semi urban areas.
Students of semi urban and urban areas should be properly motivated
and proper study habits may be developed among them to improve
their standards.

12. It is also observed from this study that the achievement of SC/ST and
BC Students is less, when compared with OC Students. Therefore
special attention should be paid towards SC/ST and BC students. Extra
classes and suitable remedial measures for SC/ST and BC students, are
to be taken by all the concerned teachers, to raise their achievement
levels.

13. It is observed that performance of male students is slightly better than
female students. Healthy and proper competitive spirit may be
developed among male and female pupils, in their academic
activities.

14. Mother's and Father's education is positively related to the
achievement in mathematics. Hence steps may be taken to encourage
the parents to improve their qualifications through distance mode of
education. [Directorates of Distance Education (D.D.E)].

15. It is observed that the students of Hindu religion have performed better
than the students of other religions. The Muslim and Christian
students may be properly motivated to improve their achievement.
16. Annual income of the family is positively related with achievement. Hence more number of scholarships, loan facilities for school education may be provided to the pupils by the government and other funding agencies. Special care must be taken by parents to see that children must be kept in dark about the financial burdens of the family.

17. Students may suitably be provided with proper study facilities at home and at school, by the concerned.

18. It is observed that number of study hours at home is positively related with achievement. Hence the pupils may be encouraged by parents to study at least three to four hours daily at home.

19. Works at home, is negatively related with achievement. Hence the students may not be assigned with other works, other than studies, at home, by the parents. Here parents' co-operation is needed.

20. The following personality characteristics may be developed among the 10th class pupils, through counselling and guidance for better scholastic achievement in mathematics. i) More-intelligent, ii) Emotionally stable iii) Assertive, iv) Super-ego strength, v) Venturesome, vi) Tens-minded, vii) Placid and viii) Controlled.

21. It is found that all the seven areas of study habits are positively related with the scholastic achievement of pupils. Hence proper study habits may be developed in the pupils for better achievement both at home and at school.

23. **Kothari commission (1964-66) observed.**

1) Special attention should be given to the study of mathematics in view of the importance of quantification and advent of automation and cybernetics.

2) The curriculum in mathematics need to be modernized and brought up-to-date at all stages, with necessary emphasis on laws and principles of mathematics and logical thinking.

In view of the present unprecedented development of science and technology, the extensive use of computer knowledge, in all the fields of education, mathematics assumes a special significance and hence raising the standards in mathematics at primary and secondary levels of education is the primary duty of teachers, parents, educational managements, administrators and governments;

24. The investigator, has been associated, with the teaching profession for the last 35 years at different levels of education namely 1. Upper primary level, 2. Secondary level, 3. Intermediate level, 4) Degree level and 5. B.Ed level and has been associated with teaching of mathematics, in the above levels of education. The investigator, with the present scientific investigation, combined with his vast experience feels that proper commitment on the part of the teacher, handling of the subject, his potentialities and humour, his efforts in developing positive attitude towards the subject, his motivational efforts, his efforts in making the students to realize the importance of the mathematics and its usefulness, its relation with other subjects and its practical values in the daily life of human-beings; lowest or highest class of the society and narrating often and often some interesting and important events from the life history of famous mathematicians would help create interest in the subject and thereby improvement in achievement of mathematics can be made possible.
The combined efforts of teachers and parents in developing good study habits at the early stage of a child, would be fruitful.

The pupils must be made to solve at least fifty per cent of the problems, in each exercise after the concepts, pertaining to every principle, have been made clear, by the teacher.

Mathematics is a different subject when compared to other subjects, in the sense that, the pupils seem to understand the subject well, while listening to the teaching, but face difficulty to solve the problems independently, in different situations. Therefore pupils must be made to solve as many problems as possible to gain perfection.

Further majority of the students have test-anxiety in mathematics and hence this anxiety is to be removed by proper guidance and counselling and also by involving them in solving the more number of problems.

The pupils must be made, to be thorough with each and every formulae and must be so trained as to apply them systematically, wherever necessary.

Parents must constantly encourage the children towards their education, know their interests and aptitudes and safeguard their interests.

6.5 LIMITATIONS OF THE STUDY AND SUGGESTIONS FOR FURTHER RESEARCH

The following limitations and suggestions are considered for further investigation.

1. The present study is confined only to 1444 students. Future researchers may undertake studies with large samples.

2. This study is confined only to Chittoor District. It may be extended for other districts of Andhra Pradesh and other states of the country.
3. This study is confined only to 10th class students. It may be extended to other classes, lower or higher viz 6th, 7th, 8th and 9th classes, Intermediate course and Degree levels.

4. This investigation is limited to mathematics subject only. This kind of research in different school subjects can be planned to plug the weak areas in the respective subjects.

5. The tool used for measuring the achievement in mathematics is developed and standardized by the investigator. Therefore, it is suggested that standardized tools, for measuring the achievements in different subjects should be developed for repeated use, by different researchers, keeping in view, the existing syllabus in school subjects.

6. Only very few socio-demographic variables and psycho-sociological variables are used in the present study. Some other variables like attitude of teachers towards the subject, attitude of students towards mathematics, facilities in the school, parental involvement in the education of their children, teachers qualifications and merits, regularity of students etc may help to know their impact on achievement in mathematics.

7. Studies to estimate the influence of course content, books available, availability of guide material for teachers, laboratory facilities for mathematics, may be under taken.

8. A longitudinal study may be conducted in order to prove that good scholastic achievement, in secondary level, will lead to the corresponding success in higher levels.

9. Studies to estimate the influence of medium of instruction may be under taken.
10. Studies related to the ‘Commitment of Mathematics Teachers’ may be under taken, keeping in view their teaching style, completion of syllabus on time, taking special classes for backward students, conducting of periodical tests and evaluating them, maintaining cordial relations with students and parents etc.

11. Studies related to the teacher–pupil ratio may be undertaken to know the impact of this ratio on the achievement in mathematics at 10th class and higher levels.

12. The government is spending huge amounts of money on in-service training programmes of mathematics teachers and other subject teachers. Hence studies may be undertaken to know the impact of these in-service training programmes on the achievement of students in mathematics at 10th class level or other levels or other levels.

13. Studies may be conducted to know the impact of higher qualifications of mathematics teachers on the achievement in mathematics of 10th class students.

14. Studies may be conducted to know the various causes for under-achievement in mathematics at 10th class level, so as to enable school administration to take suitable remedial measures.