CHAPTER V
SUMMARY, FINDINGS AND CONCLUSION

5.0 Introduction

India, being a developing country, depends largely for all its future developments, on the resources of the educated population. Hence educational system must take a leading role to promote effective learning on the part of the pupils by adopting suitable curriculum and teaching strategies suited to the needs and capabilities of the learner facilitating the achievement of national goals.

Children with various learning problems are a neglected group in our school system. Labeled as ‘failures’ they often bear the brunt of criticism by parents and teachers. As Learning Disabled and Academically Backward pupils are not able to reach the expected levels of attainment in their educational pursuits, they are both affected academically and non academically. Their success in life is hampered and they cannot make considerable contributions to the growth of the nation. Hence the pupils with learning problems must be identified and proper guidance and necessary support systems must be provided to these children. Otherwise the child becomes laggard in class or often drops out of the school.

The teaching and learning of Mathematics have always been of central concerns in educational research. A person who lacks both a minimal competency in fundamental computation of numbers and the ability to deal
with transactions finds life difficult in the society. Realising the importance of Mathematics, the present study has chosen this variable for research. The study on Performance in Mathematics of Learning Disabled and Academically Backward pupils is very significant because their mathematical ability can be developed successfully in the general education classroom with proper accommodation and special educational/instructional support.

The present study has been specifically intended to study the disabilities/difficulties faced by Learning Disabled and Academically Backward pupils in Mathematics. The relative contribution of research variables such as (Home Life Experience, IQ, Mathematics Attitude, Behaviour Problems) Personal Variables such as (Sex, Community, Fathers’ Education, Father’s Occupation, Family Type) and school-related variables such as (Management of the School and Board of Affiliation) towards Performance in Mathematics of Learning Disabled and Academically Backward pupils is also investigated in this study.

5.1 Statement of the Problem

The problem is stated as “A Study of the Performance in Mathematics of Learning Disabled and Academically Backward Pupils”.

5.2 Objectives of the Study

1. To study the Performance in Mathematics of Learning Disabled pupils.

2. To study the Home Life Experience of Learning Disabled pupils.
3. To measure the Intelligence Quotient (IQ) of Learning Disabled pupils.

4. To study the Mathematics Attitude of Learning Disabled pupils.

5. To study the Behaviour Problems of Learning Disabled pupils.

6. To study whether the Learning Disabled pupils belonging to different groups based on Sex, Community, Father’s Education, Father’s Occupation and Family Type differ significantly in their
   a. Performance in Mathematics
   b. Home Life Experience
   c. IQ
   d. Mathematics Attitude
   e. Behaviour Problems

7. To study whether the Learning Disabled pupils studying in different schools based on Management and Board of Affiliation differ significantly in their
   a. Performance in Mathematics
   b. Home Life Experience
   c. IQ
   d. Mathematics Attitude
   e. Behaviour Problems

8. To study the Performance in Mathematics of Academically Backward pupils

9. To study the Home Life Experience of Academically Backward pupils

10. To measure the Intelligence Quotient (IQ) of Academically Backward pupils

11. To study the Mathematics Attitude of Academically Backward pupils.
12 To study the Behaviour Problems of Academically Backward pupils.

13 To study whether the Academically Backward pupils belonging to different groups based on Sex, Community, Father's Education, Father's Occupation and Family Type differ significantly in their

a. Performance in Mathematics
b. Home Life Experience
c. IQ
d. Mathematics Attitude
e. Behaviour Problems

14 To study whether the Academically Backward pupils studying in different schools based on Management and Board of Affiliation differ significantly in their

a. Performance in Mathematics
b. Home Life Experience
c. IQ
d. Mathematics Attitude
e. Behaviour Problems

15 To study whether the Learning Disabled pupils and the Academically Backward pupils differ significantly in their

a. Performance in Mathematics
b. Home Life Experience
c. IQ
d. Mathematics Attitude
e. Behaviour Problems

16 To study the relative contributions of the personal variables (Sex, Community, Father's Education, Father's Occupation and Family Type) school related variables (Management and Board of
Affiliation) and the research variables (Home Life Experience, IQ, Mathematics Attitude and Behaviour Problems) towards the Performance in Mathematics of Learning Disabled pupils.

17 To derive the Regression of Performance in Mathematics of Learning Disabled pupils on the variables in the form of equations (Raw score form and standard score form)

18 To study the relative contributions of the personal variables (Sex, Community, Father’s Education, Father’s Occupation and Family Type) school related variables (Management and Board of Affiliation) and the research variables (Home Life Experience, IQ, Mathematics Attitude and Behaviour Problems) towards the Performance in Mathematics of Academically Backward pupils

19 To derive the Regression of Performance in Mathematics of Academically Backward pupils on the variables in the form of equations (Raw score form and standard score form)

20 To identify the significant discriminating variables of Learning Disabled pupils and Academically Backward pupils

21 To formulate the discriminant equations for the two groups, Learning Disabled pupils and Academically Backward pupils

22 To diagnose the types of errors committed by the Learning Disabled pupils and the Academically Backward pupils in Mathematics.

5.3 Hypotheses of the Study

1. Learning Disabled Boys and Girls differ significantly in their
   a. Performance in Mathematics
   b. Home Life Experience
   c. IQ
   d. Mathematics Attitude
   e. Behaviour Problems
2. Learning Disabled pupils belonging to different Communities differ significantly in their
   a. Performance in Mathematics
   b. Home Life Experience
   c. IQ
   d. Mathematics Attitude
   e. Behaviour Problems

3. The Learning Disabled pupils whose Fathers have different levels of Education differ significantly in their
   a. Performance in Mathematics
   b. Home Life Experience
   c. IQ
   d. Mathematics Attitude
   e. Behaviour Problems

4. The Learning Disabled pupils whose Fathers hold different types of Occupation differ significantly in their
   a. Performance in Mathematics
   b. Home Life Experience
   c. IQ
   d. Mathematics Attitude
   e. Behaviour Problems

5. The Learning Disabled pupils belonging to Nuclear and Joint Family differ significantly in their
   a. Performance in Mathematics
   b. Home Life Experience
   c. IQ
   d. Mathematics Attitude
   e. Behaviour Problems
6. The Learning Disabled pupils studying in different Management of Schools differ significantly in their
   a. Performance in Mathematics
   b. Home Life Experience
   c. IQ
   d. Mathematics Attitude
   e. Behaviour Problems

7. The Learning Disabled pupils studying in different Boards of Affiliation differ significantly in their
   a. Performance in Mathematics
   b. Home Life Experience
   c. IQ
   d. Mathematics Attitude
   e. Behaviour Problems

8. Academically Backward Boys and Girls differ significantly in their
   a. Performance in Mathematics
   b. Home Life Experience
   c. IQ
   d. Mathematics Attitude
   e. Behaviour Problems

9. Academically Backward pupils belonging to different Communities differ significantly in their
   a. Performance in Mathematics
   b. Home Life Experience
   c. IQ
   d. Mathematics Attitude
   e. Behaviour Problems
10. Academically Backward pupils whose Fathers have different levels of Education differ significantly in their
   a. Performance in Mathematics
   b. Home Life Experience
   c. IQ
   d. Mathematics Attitude
   e. Behaviour Problems

11. Academically Backward pupils whose Fathers hold different types of Occupation differ significantly in their
   a. Performance in Mathematics
   b. Home Life Experience
   c. IQ
   d. Mathematics Attitude
   e. Behaviour Problems

12. Academically Backward pupils belonging to Nuclear and Joint Family differ significantly in their
   a. Performance in Mathematics
   b. Home Life Experience
   c. IQ
   d. Mathematics Attitude
   e. Behaviour Problems

13. Academically Backward pupils studying in different Management of Schools differ significantly in their
   a. Performance in Mathematics
   b. Home Life Experience
   c. IQ
   d. Mathematics Attitude
   e. Behaviour Problems
14. Academically Backward pupils studying in different Boards of Affiliation differ significantly in their
   a. Performance in Mathematics
   b. Home Life Experience
   c. IQ
   d. Mathematics Attitude
   e. Behaviour Problems

15. Learning Disabled pupils and Academically Backward pupils differ significantly in their
   a. Performance in Mathematics
   b. Home Life Experience
   c. IQ
   d. Mathematics Attitude
   e. Behaviour Problems

5.4 Method of Study

   As the study intends to collect data pertaining to the study of Performance in Mathematics of Learning Disabled and Academically Backward, Normative Survey Method is employed to describe and interpret what exists at present.

5.5 Variables Under Study

   The following variables were selected for the study

   Personal Variables:
   1. Sex
   2. Community
   3. Father’s Education
   4. Father’s Occupation
   5. Family Type
School Related Variables:-

1. Management of the School
2. Board of Affiliation

Research Variables:-

1. Performance in Mathematics
2. Home Life Experience
3. Intelligence Quotient (IQ)
4. Mathematics Attitude
5. Behaviour Problems

5.6 Tools Used

The following tools were used for the study.

1. Personal Data Sheet developed by the Investigator and the Guide.
2. Mathematics Performance Test developed by the Investigator and the Guide.
3. Home Life Experience Questionnaire (Hemalatha and Kumaran, 2000).
4. Intelligence Test-Cattell’s culture fair (scale 2, form A) (Cattell, 1973)
5. Mathematics Attitude Questionnaire developed by the Investigator and the Guide
6. Scale for Screening the Learning Disabled developed by the Investigator and the Guide

5.7 Sample

In this study, 682 pupils of Standard V from 50 schools who had learning problems as per school records and observation report of the concerned teachers were taken as the sample. With the help of Intelligence test and the Scale for Screening the Learning Disabled, 309 pupils from 682 pupils were identified as Learning Disabled. The remaining 373 pupils were taken as Academically Backward.
5.8 Findings of the Present Study

5.8.1 Findings based on Descriptive and Differential Analysis of the Data related to Learning Disabled Pupils

Performance in Mathematics

1. The Overall Performance in Mathematics of the pupils was assessed to be 18.60 (18.60%). The mean scores in 10 Areas of Mathematics ranged from 0.77 (7.70%) for Measurement, Money & Time to 3.48 (34.80%) for Number Recognition.

2. Boys and Girls did not differ significantly in the Overall Performance in Mathematics and in 10 Areas of Mathematics.

3. The pupils belonging to different Communities differed significantly in the Overall Performance in Mathematics and in 5 Areas namely Basic Number Facts, Sequencing, Mathematical Terms, Computation and Visual Perception. The pupils belonging to Backward Community scored the highest in the Overall Performance and in the four significantly differed Areas. They scored the least in Mathematical Terms.

The pupils belonging to Most Backward Community scored the least in the Overall Performance and in 4 Areas namely, Basic Number Facts, Sequencing, Computation and Visual Perception.

The pupils belonging to Scheduled (Caste & Tribe) Communities scored the highest mark in Mathematical Terms. The pupils belonging to Scheduled (Caste & Tribe) Communities also scored the least in Basic Number Facts.

4. The wards of fathers with different levels of education differed significantly in the Overall Performance in Mathematics and in 6 Areas namely Sequencing, Mathematical Terms, Computation, Word Problems, Visual Perception and Measurement, Money & Time.

The pupils whose Father's Education was upto Elementary had the highest score in Mathematical Terms and they scored the least in four
Areas namely Sequencing, Computation, Visual Perception and Measurement, Money & Time

The pupils whose Father’s Education was upto Secondary scored the highest in two Areas Sequencing and Computation. They scored the least in Mathematical Terms.

The pupils whose Father’s Education was upto Higher Secondary scored the highest in Word Problems

The pupils whose Father’s Education was upto Graduation scored the highest in two Areas Visual Perception and Measurement, Money & Time. They scored the least in Word Problems

The wards whose Fathers hold different types of Occupation differed significantly in 7 Areas namely Basic Number Facts, Left-Right Recognition, Mathematical Terms, Computation, Word Problems, Visual Perception and Measurement, Money & Time

The wards whose fathers were Coolies had the highest score in two Areas namely Mathematical Terms and Word Problems, and the least score in 5 Areas namely Basic Number Facts, Left-Right Recognition, Computation, Visual Perception and Measurement, Money & Time

The wards whose fathers were Employed had the highest score in three Areas namely Left-Right Recognition, Visual Perception and Measurement, Money & Time and the least score in two Areas Mathematical Terms and Word Problems.

The wards whose fathers were Self-employed had the highest score in two Areas namely Basic Number Facts and Computation

The pupils belonging to Nuclear Family and Joint Family differed significantly only in 2 Areas of Mathematics namely Computation and Measurement, Money & Time. The former got more marks in these Areas than the latter.

The pupils studying in different Management of the Schools differed significantly in the Overall Performance in Mathematics and in 7 Areas

The pupils studying in Government Schools scored the highest in Mathematical Terms and secured the least score in three Areas namely Basic Number Facts, Visual Perception and Measurement, Money & Time.

Those in Corporation Schools scored the least in Computation

The pupils studying in Private Aided Schools scored the highest in Word Problems and the least in Sequencing.

The pupils studying in Private Unaided Schools had the highest score in the Overall Performance in Mathematics and in 5 Areas namely Basic Number Facts, Sequencing, Computation, Visual Perception and Measurement, Money & Time and they had the least score in two Areas namely Mathematical Terms and Word Problems.

The pupils studying in different Boards of Affiliation differed significantly in the Overall Performance in Mathematics and in all the Areas except in two namely Number Recognition and Mathematical Symbols. The pupils belonging to Matriculation Schools scored the higher marks in the Overall Performance in Mathematics and in 6 out of 8 significantly differed Areas namely Basic Number Facts, Sequencing, Left-Right Recognition, Computation, Visual Perception and Measurement, Money & Time than those in State Board Schools.

In the remaining two Areas namely Mathematical Terms and Word Problems, State Board School pupils secured the highest mark.

**Home Life Experience**

The Overall Home Life Experience of pupils was assessed to be 20.80 (52%). The mean scores in four factors of Home Life Experience ranged from 4.90 (49%) for Peer Group Participation to 5.42 (54.2%) for Educational Encouragement.
2. Boys and Girls did not differ significantly in the Overall Home Life Experience and in any of its factors.

3. The pupils belonging to Backward Community had better Overall Home Life Experience as well as better Educational Encouragement, Family Climate, Peer Group Participation and opportunities for Extra Curricular Activities than the other Communities. The same were found to be poorer for those belonging to Most Backward Community.

4. The pupils whose Father’s Education was upto Graduation had better Overall Home Life Experience as well as better Educational Encouragement, Family Climate and Peer Group Participation than the other three groups. The same were poorer for those whose Father’s Education was upto Elementary. Father’s Level of Education did not bring any significant difference among the pupils in getting opportunities for Extra Curricular Activities.

5. The Wards of Self-employed fathers had better Overall Home Life Experience as well as better Family Climate, Peer Group Participation and opportunities for Extra Curricular Activities, while those of Coolies had poorer Home Life Experience and its four factors. The wards of Employed fathers had better Educational Encouragement than the other two groups.

6. The pupils belonging to Nuclear Family and Joint Family did not differ significantly in the Overall Home Life Experience and in any of its factors.

7. The pupils studying in Private Unaided Schools had better Overall Home Life Experience and its four factors and the same were poorer for those in Corporation Schools.

8. The pupils studying in Matriculation Schools had better Overall Home Life Experience and its four factors than those in State Board Schools.
Intelligence Quotient (IQ)

1. The Intelligence Quotient (IQ) of the pupils was assessed to be 96.49
2. Boys and Girls did not differ significantly in IQ.
3. The pupils belonging to different Communities did not differ significantly in IQ
4. The Father’s level of Education did not bring any significant difference in pupil’s IQ.
5. The Father’s Occupation did not bring any significant difference in pupil’s IQ
6. IQ was greater for the pupils belonging to Nuclear Family than those in Joint Family.
7. The pupils studying in different Managements of the Schools did not differ significantly in IQ
8. IQ was greater for the pupils studying in Matriculation Schools than those in State Board Schools

Mathematics Attitude

1. The Mathematics Attitude of the pupils was assessed to be 13.82 (55.28%)
2. Boys had more favourable Attitude towards Mathematics than their counterpart
3. The pupils belonging to Backward Community had more favourable Attitude towards Mathematics than the other Communities, whereas the Most Backward pupils had the less favourable Mathematics Attitude
4. The Father’s level of Education did not bring any significant difference in pupils’ Attitude towards Mathematics.
5. The wards of Self-employed fathers had more favourable Attitude towards Mathematics and those of Coolies had the less favourable attitude.
6. The pupils belonging to Nuclear Family and Joint Family did not differ significantly in Mathematics Attitude.

7. The pupils studying in Private Unaided Schools had more favourable Attitude towards Mathematics and those in Government Schools had less favourable Attitude.

8. The pupils studying in Matriculation Schools had more favourable Attitude towards Mathematics than those in State Board Schools.

Behaviour Problems

1. The Overall Behaviour Problems of the pupils was assessed to be 232.46 (58.12%). The mean scores in four factors of Behaviour Problems ranged from 52.05 (52.05%) for Psychosocial Problems to 65.65 (65.65%) for Problems in Academic Performance.


3. The pupils belonging to Most Backward Community had more Overall Behaviour Problems and Psychosocial Problems than those belonging to Backward Community and Scheduled (Caste & Tribe) Communities. The pupils belonging to different Communities did not differ significantly in three of four factors of Behaviour Problems namely Problems in Academic Performance, Anxiety and Problems in Perceptual & Motor Performance.

4. The Father's level of Education did not bring any significant difference among the pupils in the Overall Behaviour Problems and in any of its factors.
The Father’s Occupation did not bring any significant difference among the pupils in the Overall Behaviour Problems and in any of its factors.

The pupils belonging to Nuclear Family had less Overall Behaviour Problems as well as less Psychosocial Problems, Anxiety, Problems in Perceptual & Motor Performance than those in Joint Family. They did not differ significantly in ‘Problems in Academic Performance’.

The pupils belonging to different Management of the Schools did not differ significantly in the Overall Behaviour Problems and two out of its four factors namely Problems in Academic Performance and Problems in Perceptual & Motor Performance. The pupils studying in Private Aided and Private Unaided Schools differed significantly in Psychosocial Problems and Anxiety. Psychosocial Problems and Anxiety were more for those studying in Private Aided schools.

The pupils studying in Matriculation Schools and State Board schools differed significantly in the Overall Behaviour Problems and in two of its four factors namely Psychosocial Problems and Anxiety. The above said problems were more for those in State Board Schools than those in Matriculation Schools. They did not differ significantly in ‘Problems in Academic Performance’ and in ‘Problems in Perceptual & Motor Performance’.

5.8.2 Findings based on Descriptive and Differential Analysis of the Data related to Academically Backward Pupils

Performance in Mathematics

The Overall Performance in Mathematics was assessed to be 35.60 (35.60%) The mean scores in 10 Areas of Mathematics ranged from 1.95 (19.50%) for Measurement, Money & Time to 5.38 (53.80%) for Number Recognition.

Boys and Girls did not differ significantly in the Overall Performance in Mathematics and in any of its 10 Areas.
3. The pupils belonging to different Communities differed significantly in the Overall Performance in Mathematics and in all its Areas except in 2 Areas namely Mathematical Terms and Word Problems. The pupils belonging to Backward Community scored the highest in the Overall Performance in Mathematics and in all the 8 significantly differed Areas.

The pupils belonging to Most Backward Community scored the least in the Overall Performance and in 7 Areas except in Mathematical Symbols where Scheduled (Caste & Tribe) Communities scored the least.

4. The pupils with different levels of Father’s Education differed significantly in the Overall Performance in Mathematics and in all the Areas except in 2 Areas namely Mathematical Terms and Word Problems.

The pupils whose Father’s Education was upto Elementary did very poorly in the Overall Performance in Mathematics and in all the 8 significantly differed Areas.

The pupils whose Father’s Education was upto Graduation scored the highest in 7 Areas namely, Number Recognition, Basic Number Facts, Left-Right Recognition, Mathematical Symbols, Computation, Visual Perception and Measurement, Money & Time. The pupils whose Father’s Education was upto Higher Secondary scored the highest in Sequencing.

5. The pupils whose Fathers hold different types of Occupation differed significantly in the Overall Performance in Mathematics and in 7 Areas namely Basic Number Facts, Sequencing, Left-Right Recognition, Mathematical Symbols, Computation, Visual Perception and Measurement, Money & Time.
The pupils whose fathers were Coolies had the poorest Overall Performance in Mathematics and scored the least in 7 significantly differed Areas.

The pupils whose fathers were Employed had the highest Overall Performance in Mathematics and scored the highest in five Areas namely Basic Number Facts, Sequencing, Mathematical Symbols, Computation and Visual Perception.

The pupils whose fathers were Self-employed scored the highest in two Areas Left-Right Recognition and in Measurement, Money & Time.

The pupils with different Family Types differed significantly in the Overall Performance in Mathematics and in all its Areas except in Mathematical Terms. The pupils belonging to Nuclear Family had the highest Overall Performance in Mathematics and highest score in nine significantly differed Areas than those in Joint Family.

The pupils studying in different Management of the Schools differed significantly in the Overall Performance in Mathematics and in all the Areas except in area Mathematical Terms. The pupils studying in Government Schools had the least Overall Performance in Mathematics and scored the least in 8 Areas namely Number Recognition, Basic Number Facts, Sequencing, Left-Right Recognition, Computation, Word Problems, Visual Perception and Measurement, Money & Time.

The pupils studying in Corporation Schools scored the highest in Word Problems and the least in Mathematical Symbols.

The pupils studying in Private Unaided Schools had the highest Overall Performance in Mathematics and scored the highest in 8 Areas namely Number Recognition, Basic Number Facts, Sequencing, Left-Right Recognition, Mathematical Symbols, Computation, Visual Perception and Measurement, Money & Time.
The pupils studying in Private Aided Schools also scored the highest in Basic Number Facts.

8. The pupils studying in different Boards of Affiliation differed significantly in the Overall Performance in Mathematics and in all its Areas except in Word Problems.

The pupils belonging to Matriculation Schools had better Overall Performance in Mathematics and higher marks in 8 out of 9 significantly differed Areas namely Number Recognition, Basic Number Facts, Sequencing, Left-Right Recognition, Mathematical Symbols, Computation, Visual Perception and Measurement, Money & Time than those in State Board Schools. In Mathematical Terms, State Board School pupils secured the highest mark.

**Home Life Experience**

1. The Overall Home Life Experience of the pupils was assessed to be 16.31 (40.78%). The mean scores in four factors of Home Life Experience ranged from 3.45 (34.50%) for Extra Curricular Activities to 5.08 (50.80%) for Educational Encouragement.

2. Boys and Girls did not differ significantly in the Overall Home Life Experience and in any of its factors.

3. The pupils belonging to Backward Community had better Overall Home Life Experience as well as its factors than the other Communities and the same were poorer for those belonging to Scheduled (Caste & Tribe) Communities.

4. The pupils whose Father's Education was upto Elementary had poor Overall Home Life Experience as well as its factors than the other groups and the same were better for those whose Father's Education was upto Graduation.
5. The Wards whose fathers were Employed had better Overall Home Life Experience as well as its factors than the other groups. The wards whose fathers were Coolies had poorer Overall Home Life Experience as well as its four factors than those whose fathers were Employed and Self-employed.

6. The pupils belonging to Nuclear Family had better Overall Home Life Experience than those of Joint Family. They did not differ significantly in any of its factors.

7. The pupils studying in Private Unaided Schools had better Overall Home Life Experience as well as its factors. The pupils studying in Private Aided Schools had poorer Overall Home Life Experience as well as poorer Educational Encouragement, Family Climate and Peer Group Participation. The pupils studying in Government Schools had the least opportunities for Extra Curricular Activities.

8. The pupils studying in Matriculation Schools had better Overall Home Life Experience as well as its four factors than those in State Board Schools.

Intelligent Quotient (IQ)

1. The Intelligence Quotient (IQ) of the pupils was assessed to be 90 79.

2. Boys and Girls did not differ significantly in IQ.

3. The pupils belonging to Backward Community had higher level of IQ than the other groups whereas the Most Backward Community pupils had the least IQ.

4. The pupils whose Father’s Education was either upto Higher Secondary or Graduation had higher level of IQ than those whose Father’s Education was either upto Elementary or Secondary.

5. Father’s Occupation did not bring any significant difference among the pupils in IQ.
6. The pupils belonging to Nuclear Family had higher level of IQ than those in Joint Family.

7. IQ was greater for the pupils studying in Private Unaided School than those of other Management Schools. The pupils studying in Government Schools had the least IQ.

8. IQ was greater for the pupils studying in Matriculation Schools than those in State Board Schools.

Mathematics Attitude
1. The Mathematics Attitude of the pupils was assessed to be 11 42 (45.68%).

2. Boys and Girls did not differ significantly in Mathematics Attitude.

3. The pupils belonging to Backward Community had more favourable Attitude towards Mathematics than those belonging to Most Backward Community and Scheduled (Caste & Tribe) Communities.

4. The pupils whose Father's Education was either upto Higher Secondary or Graduation had more favourable Attitude towards Mathematics and those whose Father's Education was upto Elementary had less favourable Attitude towards Mathematics than the other groups.

5. The pupils whose fathers were Coolies had less favourable Attitude towards Mathematics than the other groups. Whereas those whose fathers were Employed had more favourable Attitude towards Mathematics.

6. The pupils belonging to Nuclear Family had more favourable Attitude towards Mathematics than those in Joint Family.

7. The pupils studying in Private Unaided Schools had more favourable Attitude towards Mathematics than the other groups. The same was less for those studying in Government Schools.
8. The pupils studying in Matriculation Schools had more favourable Attitude towards Mathematics than those in State Board Schools.

**Behaviour Problems**

1. The Overall Behaviour Problems of the pupils was assessed to be 189.43 (47.36%). The mean scores in four factors of Behaviour Problems ranged from 38.74 (38.74%) for Psychosocial Problems to 53.42 (53.42%) for Anxiety.

2. Boys and Girls did not differ significantly in the Overall Behaviour Problems and in any of its factors.

3. The pupils belonging to different Communities differed significantly in 'Problems in Academic Performance' only. The pupils belonging to Most Backward Community had more Problems in Academic Performance and the same was less for Scheduled (Caste & Tribe) Communities.

4. Father's level of Education did not bring any significant difference among the pupils in the Overall Behaviour Problems and in any of its factors.

5. Father's Occupation did not bring any significant difference among the pupils in the Overall Behaviour Problems and in any of its factors.

6. The pupils belonging to Nuclear Family had less Overall Behaviour Problems, Problems in Academic Performance and Psychosocial Problems than those in Joint Family. They did not differ significantly in two factors of Behaviour Problems namely Anxiety and Problems in Perceptual & Motor Performance.

7. The pupils studying in different Management of the Schools differ significantly in 'Problems in Perceptual & Motor Performance' only. Problems in Perceptual & Motor Performance were more for pupils in
Government Schools and the same was less for those in Corporation Schools.

8. Board of Affiliation did not bring any significant difference among the pupils in the Overall Behaviour Problems and in any of its factors.

5.8.3 Findings based on Comparison of Learning Disabled and Academically Backward Pupils

1. The Learning Disabled pupils and the Academically Backward pupils differed significantly in the Overall Performance in Mathematics and in its 10 Areas. Academically Backward pupils scored more marks in the Overall Performance in Mathematics as well as in all Areas than Learning Disabled pupils.

2. The percentage of errors committed due to confusion of facts was more for Learning Disabled pupils than Academically Backward pupils and the errors due to ignorance was more for Academically Backward pupils than Learning Disabled pupils.

3. The Learning Disabled pupils and Academically Backward pupils differed significantly in the Overall Home Life Experience and in all its four factors. The Learning Disabled pupils had better overall Home Life Experience as well as better Educational Encouragement, Family Climate, Peer Group Participation and Extra Curricular Activities than Academically Backward pupils.

4. IQ was greater for Learning Disabled pupils than Academically Backward pupils.

5. Learning Disabled pupils had more favourable Attitude towards Mathematics than Academically Backward pupils.

6. The Learning Disabled pupils and Academically Backward pupils differed significantly in the Overall Behaviour Problems and in all its four factors. Overall Behaviour Problems and its four factors namely Problems in Academic Performance, Psychosocial Problems, Anxiety,
Problems in Perceptual & Motor Performance were more for Learning Disabled pupils than Academically Backward pupils.

5.8.4 Findings based on Stepwise Multiple Correlation and Regression Analysis

Learning Disabled

Of the 17 variables entered, 8 variables have been identified as significant correlates of Performance in Mathematics of Learning Disabled pupils.

1. The following variables, Problems in Academic Performance, Psychosocial Problems, Mathematics Attitude, Management of the School, Problems in Perceptual & Motor Performance, Educational Encouragement, Peer Group Participation and Sex had made significant contribution towards Performance in Mathematics of Learning Disabled pupils. These variables together have contributed to the extent of 56.19% of variance in the Performance in Mathematics.

2. The Regression Equations formed are

\[ Y_1 = 1.9349 \times X_1 + 1.4077 \times X_6 - 0.5703 \times X_8 + 0.6402 \times X_{10} + 0.2918 \times X_{13} - 0.3774 \times X_{14} - 0.1763 \times X_{15} - 0.0706 \times X_{17} + 45.7174 \]

- Raw score form – for Learning Disabled pupils

\[ Y_1 = 0.0988 \times X_1 + 0.1354 \times X_6 - 0.1372 \times X_8 + 0.1248 \times X_{10} + 0.1204 \times X_{13} - 0.5220 \times X_{14} - 0.2737 \times X_{15} - 0.1348 \times X_{17} \]

- standard score form – for Learning Disabled pupils.

Where

- \( Y_1 \) = Performance in Mathematics of Learning Disabled pupils
- \( X_1 \) = Sex
- \( X_6 \) = Management of the School
- \( X_8 \) = Educational Encouragement
- \( X_{10} \) = Peer Group Participation
- \( X_{13} \) = Mathematics Attitude
- \( X_{14} \) = Problems in Academic Performance
- \( X_{15} \) = Psychosocial Problems
- \( X_{17} \) = Problems in Perceptual & Motor Performance.
Academically Backward

Of the 17 variables entered, 5 variables have been identified as significant correlates of Performance in Mathematics of Academically Backward pupils.

1. The following variables, IQ, Management of the School, Mathematics Attitude, Family Type, Father’s Education have made significant contribution towards the Performance in Mathematics of Academically Backward pupils. These variables together have contributed to the extent of 38.45% of variance in the Mathematics Performance.

2. The Regression Equations formed are

\[ Y_2 = 4.4445 X_6 + 2.6616 X_3 - 4.8005 X_5 + 0.5856 X_{12} + 0.4973 X_{13} - 33.2074 \]

- Raw score form – Academically Backward pupils

\[ Y_2 = 0.1984 X_6 + 0.1321 X_3 - 0.1094 X_5 + 0.3721 X_{12} + 0.1203 X_{13} \]

- Standard score form – Academically Backward pupils

Where

- \( Y_2 \) = Performance in Mathematics of Academically Backward pupils
- \( X_6 \) = Management of the school
- \( X_3 \) = Father’s Education
- \( X_5 \) = Family Type
- \( X_{12} \) = IQ
- \( X_{13} \) = Mathematics Attitude

5.8.5 Findings based on Discriminant Function Analysis

In Discriminant Function Analysis made with 27 variables, yielded 14 significant variables on the basis of Wilk’s Lambda and Mahalanobis D-square.

Of the 14 variables, 2 were personal variables (Community, Family Type) 1 school related variable (Board of Affiliation) and 11 research variables (Peer Group Participation, Extra Curricular Activities, IQ, Mathematics Attitude,
Problems in Academic Performance, Psychosocial Problems, Number Recognition, Sequencing, Mathematical Symbols, Word Problems, Measurement, Money & Time) of which 5 are Areas in Mathematics

1. Linear discriminant equation for the Learning Disabled pupils is

\[ Y_{LD} = 5.5586X_2 + 11.0344X_7 + 5.9693X_5 + 0.6039X_{10} + 0.0489X_{11} + 1.6029X_{12} + 0.0111X_{13} + 0.6433X_{14} + 0.4464X_{15} + 0.0621X_{18} - 0.4384X_{20} - 0.6762X_{23} + 0.2925X_{25} - 1.0643X_{27} - 128.28. \]

2. Linear discriminant equation for the Academically Backward pupils is

\[ Y_{AB} = 5.9880X_2 + 12.9205X_7 + 6.5369X_5 + 0.3548X_{10} - 0.1749X_{11} + 1.4029X_{12} - 0.0859X_{13} + 0.5383X_{14} + 0.3834X_{15} + 0.1885X_{18} - 0.2966X_{20} - 0.4806X_{23} + 0.4526X_{25} - 0.9174X_{27} - 103.3182 \]

Where

- \( Y_{LD} \) = Learning Disabled Pupil
- \( Y_{AB} \) = Academically Backward Pupil
- \( X_2 \) = Community
- \( X_7 \) = Board of Affiliation
- \( X_5 \) = Family Type
- \( X_{10} \) = Peer Group Participation
- \( X_{11} \) = Extra Curricular Activities
- \( X_{12} \) = IQ
- \( X_{13} \) = Mathematics Attitude
- \( X_{14} \) = Problems in Academic Performance
- \( X_{15} \) = Psychosocial Problems
- \( X_{18} \) = Number Recognition
- \( X_{20} \) = Sequencing
- \( X_{23} \) = Mathematical Symbols
- \( X_{25} \) = Word Problems
- \( X_{27} \) = Measurement, Money & Time

5.9 Conclusion

*Pertaining to the Learning Disabled*

1 Two factors of Home Life Experience namely Educational Encouragement and Peer Group Participation affects Performance in Mathematics.
2. Differences in Mathematics Attitude influence Performance in Mathematics.

3. Problems in Academic Performance, Psychosocial Problems, Problems in Perceptual & Motor Performance have been found to have significant negative influence on Performance in Mathematics.

4. The pupils belonging to Backward Community have been found to be superior to others in Performance in Mathematics. They had better Home Life Experience and more favourable Attitude towards Mathematics.

5. Father’s level of Education and Occupation affects the Performance in Mathematics, Home Life Experience and Mathematics Attitude.

6. The pupils belonging to Private Unaided or Matriculation Schools have been found to be superior to others in Performance in Mathematics. They had better Home Life Experience, greater IQ, more favourable Attitude towards Mathematics and less Behaviour Problems.

7. The pupils belonging to Nuclear Family had greater IQ and less Behaviour Problems.

8. Boys had more Psychosocial Problems than girls.

9. The pupils belonging to Most Backward Community had more Behaviour Problems.

10. Psychosocial Problems and Anxiety were more for Private Aided school pupils.

*Pertaining to Academically Backward*

1. Differences in Mathematics Attitude and IQ affect Performance in Mathematics.

2. The pupils belonging to Backward Community have been found to be superior to others in Performance in mathematics; they had better Home
Life Experience, greater IQ and more favourable Attitude towards Mathematics.

3. Father’s level of Education and Occupation affects Performance in Mathematics and Home Life Experience where as Father’s level of Education affects IQ and Mathematics Attitude.

4. The pupils belonging to Nuclear Family have been found to be superior in Performance in Mathematics. They had better Home Life Experience, greater IQ, and more favourable attitude towards Mathematics.

5. The pupils studying in Private Unaided Schools/Matriculation Schools were superior to others in Performance in Mathematics. They had better Home Life Experience, greater IQ, and more favourable Attitude towards Mathematics.

6. The pupils belonging to Most Backward Community had more Behaviour Problems.

7. The pupils in Nuclear Family had less Behaviour Problems.

8. The pupils studying in Government Schools had more Behaviour Problems.

Comparison of Learning Disabled and Academically Backward Pupils

1. The Learning Disabled pupils had better Home Life Experience, greater IQ and more favourable Attitude towards Mathematics than Academically Backward pupils.

2. Behaviour Problems were more for Learning Disabled pupils than Academically Backward pupils.

3. Performance in Mathematics was better for Academically Backward pupils than the Learning Disabled pupils.

4. The errors made in Performance in Mathematics due to confusion of facts were more for Learning Disabled pupils than Academically Backward pupils and the errors due to ignorance were more for Academically Backward pupils than Learning Disabled pupils.
5.10 Educational Implications of the Present Study

**Learning Disabled**

The study revealed that the Performance of Learning Disabled pupils was weak in all the 10 Areas of Mathematics mentioned earlier. They scored the least mark in Measurement, Money & Time. Sex, Educational Encouragement, Peer Group Participation, Mathematics Attitude, Management of the School have made positive contribution towards Performance in Mathematics. Problems in Academic Performance, Psychosocial Problems, Problems in Perceptual & Motor Performance have contributed negatively to Performance in Mathematics. Also the errors made by Learning Disabled pupils are mostly due to confusion of facts.

This study will help primary school teachers to identify children with Learning Disability at Primary School level and understand their problems in Mathematics. Remediation in Primary School level will prevent Learning Disability occurring at higher level. Efforts in this area will lead to the reduction in drop out rate and enhancement in the achievement level of Learning Disabled pupils. The findings will also help and develop insight in the researchers to take up research studies in this vital area at the primary school level.

The errors made by the pupils in 10 Areas of the Mathematics are mainly due to confusion, hence special methods of teaching are to be adopted for teaching Mathematics to these children. Remediation should focus on de-
emphasizing the traditional rote learning and arrange for concrete learning activities. Structured or concrete materials are to be used to develop concepts and to clarify early Number Relations, Place Value, Computation, Story Problems, Geometry and Measurement, Money & Time. Drill on simple fundamental operations (Addition, subtraction, multiplication, division) should be given as a method of over learning after each process is learned at the concrete level. Over learning will be necessary for most of the children to gain mastery in basic operations and computational skills.

To develop better comprehension of arithmetic operations, play materials like beads, pebbles or marbles may be used.

For developing the concept of geometrical shapes the objects available in the immediate environment like duster, table, book, blackboard, disks, rings etc may be used.

It may be necessary to develop pupils’ mathematical language and vocabulary as a prerequisite to organising and Sequencing information needed for problem solving. Developing their habits of verbalising examples and procedures in Mathematics can greatly help in doing Word Problems. Also Word Problems should reflect the real world and be meaningful and interesting to pupils.

In Word Problems, and in Mathematical Terms, English medium pupils did very poorly due to poor understanding of Mathematical Terms in English which lead to confusion. Hence the pupils with language confusion have to be demonstrated with concrete materials/manipulatives.
To overcome Visual Perception problems, use of pictures or graphics for teaching concepts may be avoided and instead verbal versions of Mathematics, ideas and concrete materials as anchors may be used.

For pupils with Left-right Confusion, teachers must teach them to identify their own body parts and then other objects in order to thoroughly understand this concept.

For preventing Confusion in Mathematical Symbols, different colours may be used to distinguish different symbols.

For rectifying sequential problems, the child may be asked to put in serial order (ascending or descending) a deck of cards having numbers on them. This may be repeated several times.

The Learning Disabled pupils did very poorly in Measurement, Money & Time. These concepts are more easily understood when concrete manipulative objects are used. Children master abstract concepts far better when they actually do problems with their hands.

*Academically Backward*

The findings related to Academically Backward pupils revealed that they are also weak in Mathematics particularly in Areas Basic Number Facts, Left-Right Recognition, Mathematical Symbols, Visual Perception and Measurement, Money & Time. They also scored the least in Measurement, Money & Time.

IQ, Management of the School, Mathematics Attitude, Family Type, Father’s Education have contributed to Performance in Mathematics. Also the
errors made by Academically Backward pupils are mostly due to ignorance of facts.

The method of teaching mathematics generally adopted by the teachers are not suitable for Academically Backward pupils. In most of Academically Backward pupils, intellectual efficiency is at the low ebb, therefore by nature they can’t make progress at the same pace as the normal children. They may require more repetition of examples, simplified approaches and individual attention. The basic principle for teaching Academically Backward pupils include logically constructed sequence of mathematical content and making use of concrete manipulatives in order to facilitate retention and transfer of concepts and skills learned. In addition to these, individualisation of instruction may also be very effective to Academically Backward pupils. In Mathematics class, accuracy rather than speed should be stressed. They may learn better by providing enough time for Mathematics instruction.

Small group instruction is beneficial for Academically Backward pupils by allowing for personal attention from the teachers and collaboration with peers who are working at comparable levels and skills. Special methods of remedial instruction in Mathematics should be incorporated in the syllabus of the teachers training course so that the teacher will be able to handle such problems satisfactorily when they arise. If the number of Academically Backward pupils are large in a class a special class may be provided and teachers who have special training in handling Academically Backward may be entrusted with the charge of it.
The picture of Learning Disabled and Academically Backward pupils emerging from the present investigation reveals that they belong to lower socio economic stratum and Community, parents with low level of education and occupation. Although Learning Disabled and Academically Backward pupils cut across all socio economic classes, the parents belonging to higher social strata become aware of this problem in their children earlier and they put their children in special educational institutions. But the condition of those who are not aware of this and cannot pay fees will have to depend on normal schools run by Government or Quasi-Government. Hence these schools will have to pay special attention to these children to compensate for impoverished environment.

The teachers of Government, Corporation and Private Aided Schools should also be trained to identify the nature and needs of children with Learning Disabled and Academically Backward by giving in-service programmes. Teachers should design classroom activities in such a way that they enrich Learning Disabled and Academically Backward pupils' learning.

The study has revealed the significant role played by Home towards the Performance in Mathematics. Home cannot be pulled up to the ideal level, but the goal can be achieved by converting the school as a substitute for a good home. The schools should supplement the deficiency felt in home and this can be achieved with minimum financial commitment like enough recreational facilities in the school, adoption of modern methods of teaching and
encouragement for group activities which may foster a healthy attitude in the minds of the young children towards school work.

It is also found that IQ was contributed to the Performance in Mathematics of Academically Backward pupils. In the case of children who belong to poor homes, the home atmosphere will be least suitable for intellectual work. Therefore to supplement that deficiency, varied forms of mental tasks, and intellectual games should be provided in schools to improve their IQ.

The study also revealed the significant role played by Mathematics Attitude towards Performance in Mathematics of Learning Disabled and Academically Backward pupils. Hence the teachers and parents should make enough efforts to promote a positive attitude towards this subject in their children. Teachers must find out the Attitude of the pupils towards Mathematics and they should give the child the feeling that Mathematics will help them later in life. This can be achieved by motivating the pupils by applying Mathematics concepts in such a way that they are enjoyable while learning this subject. This will motivate the learner to have a positive Attitude towards Mathematics.

Behaviour Problems had the detrimental effect on the Performance in Mathematics of Learning Disabled pupils. Also they have more Behaviour Problems than Academically Backward pupils. Well trained and efficient teacher can effectively manage these problems under a behaviour management paradigm. If the problems are severe, the child may be referred to educational
psychologist or child guidance clinic. Sometimes meditation will help the
children with Behaviour Problems

Even though Learning Disabled pupils had better Home Life Experience, greater IQ, more favourable attitude towards Mathematics than Academically Backward pupils, they did very poorly in Mathematics compared to Academically Backward pupils. These two groups of pupils differed significantly in all the variables under study. Hence Learning Disabled pupils are specific type of exceptional children. They may have problems in reading, writing, spelling, listening, arithmetic, memory, and thinking. The scholastic Performance of these children is affected due to their inabilities to do any of the above said activities. Their Performance can be improved within the normal school itself provided they get needed support on time at home and in school as well. Urgent steps need to be taken by administrators, parents, and teachers to improve the conditions of Learning Disabled children.

Schools must take greater responsibility in providing remedial help for Learning Disabled children. There must be at least one full-time teacher on the staff who is a fully trained special educator with professional experience of using specific remedial methods in teaching.

Finally, for the identification of Learning Disabled pupils, the teacher rating of child’s academic abilities are the most proficient predictors as they have an opportunity to observe the child over a period of time. Hence the Rating Scale for Screening the Learning Disabled (RSSLD) developed and validated by the investigator and the guide will be of much use to future
investigators who wish to conduct studies on Learning Disabilities in Indian context

5.11 Suggestions for Further Research

The findings of the study helped the investigator to suggest the following Areas for further research.

1 A remedial programme to improve the Performance in Mathematics of Learning Disabled and Academically Backward pupils is an option available for further research.

2 Since this study is confined to Performance in Mathematics of Learning Disabled and Academically Backward, similar studies could be conducted with reference to Learning Disabled and Academically Backward in other Areas such as reading, writing, spelling and listening comprehension.

3 An experimental study of Learning Disabled and Academically Backward before and after remedial teaching could also be undertaken.

4 Specialised tools to measure the Psychosocial Problems may be developed to study the problems of Learning Disabled pupils.

5 Tests may be developed in each school subject to diagnose the problems faced by the Learning Disabled pupils/Academically Backward pupils.