

METHODOLOGY

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**Identification of Language Learning Disabled and Non-disabled
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CHAPTER III

METHODOLOGY

Methodology is the science of methods or principles of procedure. It is the science of proper modes and orders of procedures. It includes the description of the methods or techniques adopted and the tools and the techniques the researcher has used for collecting, organising and analysing data.

In order to attack any problem, suitable method (or methods) should be adopted in relation to the objectives of the study. The decision about the method or methods to be employed, however, always depends upon the nature of the problem selected and the kinds of data necessary for its solution. The method selected should always be appropriate for the problem under investigation, feasible, pre-planned and well understood.

This chapter contains the hypotheses formulated for the study, objectives of the study, method adopted for the study, the sample selected, the tools used, the procedure for data collection and the statistical techniques employed for the analysis of data.

4.1 HYPOTHESES

The following are the hypotheses formulated for the present study:

- (1) Nearly 1/5 of the total population are learning disabled at the primary level.

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- (2) There is significant variation in the in science process skills among the normal and learning disabled as well as language disabled and mathematical disabled.
 - (3) Learning disabled students will exhibit certain gaps in science process skills which will affect their achievement in science.
 - (4) There is significant variation in the levels of achievement in science of normal and learning disabled students.
 - (5) There is significant variation in the levels of intelligence of normal and learning disabled students
 - (6) There is significant difference between boys and girls of normal and learning disabled children with respect to their science process skills, achievement in science and intelligence.

4.2 OBJECTIVES

The following are the specific objectives of the study:

- (1) To find the learning disabled (total) as well as language learning disabled and mathematical learning disabled at the primary school level.
- (2) To study the difference between the normal and learning disabled children as well as language learning disabled and mathematical learning disabled with respect to their Science Process Skills.
- (3) To study the effect of the deficit in Science Process Skills on achievement in science of the normal and learning disabled children

as well as language learning disabled and mathematical learning disabled.

- (4) To study the difference between normal and learning disabled children as well as language learning disabled and mathematical learning disabled with respect to their achievement in science.
- (5) To study the difference between normal and learning disabled children as well as language learning disabled and mathematical learning disabled with respect to their intelligence.
- (6) To study the difference between boys and girls of the normal and learning disabled with respect to their science process skills, achievement in science and intelligence.

4.3 METHOD ADOPTED FOR THE STUDY

The present study is intended to find out the effect of deficit in science process skills on achievement in science of the learning disabled children at primary level. The study also seeks to find out the effect of deficit in science process skills on achievement in science of language learning disabled and mathematical learning disabled. As such, the present study has been designed as a Descriptive study and Normative Survey method was adopted as the appropriate means for gathering data essential for the study.

4.4 SAMPLE SELECTED FOR THE STUDY

The sample for the study consists of 614 students which include both boys and girls from among the students in IV Standard drawn from aided

schools of Alappuzha and Kottayam districts of Kerala. The list of schools selected for the study is given as Appendix I.

The break up of the sample selected for the study is given in Table 4.1.

Table 4.1

Break up of the Sample Selected for the Study

Subsamples	No. and %
Boys	328 (53.42%)
Girls	286 (46.58%)
Total	614 (100%)

Though a general data sheet was provided to the children to identify the socio-economic status of the students, the SES of the children were found to be similar. So, socio-economic status was not taken into consideration in the analysis of data. The general data sheet is given as Appendix II and its English version is given as Appendix III.

4.5 TOOLS USED FOR THE PRESENT STUDY

The following are the tools used for the present study:

1. Science Process Skill Test
2. Test of Achievement in Science
3. Diagnostic Test to identify the disorders of Reading and Writing
4. Diagnostic Test to identify Mathematical Disabilities
5. Raven's Coloured Progressive Matrices Sets A, Ab and B.

4.5.1 Science Process Skills Test for Standard IV

The science process skills test was developed in order to measure the science process skills of the students of standard IV. The test was developed and standardised by the investigator himself. It was developed following all the conventional procedures for test construction and standardisation strictly. To measure the science process skills of the students, five main skills out of the 13 skills specified by American Association of Advancement of Science (1971) were taken. They are: skill in observation, measuring, prediction, inferring and classification. The investigator framed 60 items keeping in view the above mentioned skills. The items were taken from the science textbook for standard IV and general science encyclopaedia. The initial pool of questions thus developed was submitted to the experts in the field of teaching the concerned subjects. Their suggestions were incorporated for making necessary modifications in the format of the items also. Based on their suggestions, some items were deleted and some were modified. The list of experts selected for the study is given as Appendix IV. Thus, a draft test consisting of 40 items were prepared. The draft form of the science process skills test is given as Appendix V.

Item Analysis

The initial administration of the science process skills test was made on a sample of 100 standard IV children in the schools of Alappuzha and Kottayam districts. The answer sheets of all the 100 subjects were

scored and arranged in the descending order of scores for item analysis. The top 27 percent in the group (the top 27) when arranged in the descending order of the total scores and the bottom 27 percent (the bottom 27) alone were used as extreme groups for item analysis. The scores obtained for each item in these extreme groups were used for calculating the discriminating power of each item. The discriminating power was obtained by calculating the 't' value using the formula (Edwards, 1957).

$$t = \frac{\bar{X}_H - \bar{X}_L}{\sqrt{\frac{\sum (X_H - \bar{X}_H)^2 + \sum (X_L - \bar{X}_L)^2}{n(n-1)}}$$

Where

- \bar{X}_H = the mean score on a given statement for the high group
- \bar{X}_L = the mean score on the statement for the low group
- X_H = the score for a given individual for a given statement in the high group
- X_L = the score for a given individual for a given statement in the low group
- n = number of subjects in the criterion group

For the preparation of the final test, items with 't' value equal to or greater than 1.75 were selected as the value of 't' is a measure of the extent to which a question differentiates between the high and low groups. The best 30 items having the highest 't' value in the group were selected. The 't' values of the items in the draft test are given in Table 4.2.

Table 4.2

't' values Obtained for the Draft Science Process Skills Test

Sl.No.	't' value	Sl.No.	't' value
1.	4.35*	21.	4.31*
2.	3.41*	22.	6.28*
3.	5.91*	23.	3.81*
4.	7.22*	24.	9.38*
5.	1.22	25.	1.36
6.	4.88*	26.	5.64*
7.	5.65*	27.	0.68
8.	3.46*	28.	9.39**
9.	1.24	29.	2.50*
10.	9.31*	30.	6.51*
11.	8.41*	31.	4.85*
12.	6.51*	32.	5.86*
13.	9.80*	33.	1.98
14.	1.11	34.	8.22*
15.	10.28*	35.	3.79*
16.	1.95	36.	1.22
17.	3.81*	37.	10.26*
18.	1.25	38.	5.45*
19.	7.19*	39.	1.27
20.	2.01	40.	6.26*

* indicates selected items

Thus, a final form of the test consisting of 30 items was prepared. The final form of the science process skills test carries a maximum mark of 50. In the first part of the test, there are 10 questions carrying one mark each. The second part of the test has five questions carrying one mark each. The third part of the test consists of five questions. The first question (question No.16) has 4 sub-questions bearing one mark each. The second

question (question No.17) also has four sub-questions bearing one mark each. Question Nos. 18, 19 and 20 are also having 4 sub-questions each carrying one mark each. The fourth part of the test consists of five questions (question Nos. 21-25) carrying one mark each and the final and fifth part consists of 5 questions (question Nos. 26-30) carrying 2 marks each.

The final form of the science process skills test and its scoring key are given as Appendix VI and Appendix VII and its English version is given as Appendix VIII.

4.5.2 Validity and Reliability of the Science Process Skills Test

The concurrent validity of the test was ensured by correlating the test scores with the class examination marks of 100 students selected at random from standard IV, for the purpose of validating the test. The class examination marks were collected from the progress report of the concerned students from the school. The validity coefficient was found to be 0.62. This shows that the test is reasonably valid for the purpose for which it is constructed.

The reliability coefficient of the test determined by the Split-Half method was 0.71, the coefficient of correlation corrected by the Spearman-Brown Prophecy Formula was found to be 0.69. The Test-Retest reliability of the test with one month interval was found to be 0.71. This shows that the science process skills test is a reliable tool for measuring science process skills of pupils studying in IV standard.

4.5.3 Test of Achievement in Science

An achievement test in science for standard IV was also constructed and standardised by the investigator. This test was also constructed following all the conventional procedures for test construction and standardisation. In constructing the test, the standard IV science textbook was used to select questions to ensure its validity. Altogether 60 items were prepared based on the textbook and this was given to experts in the field of science teaching for their suggestions. According to their suggestions, certain items were modified and some others deleted. Thus, a draft achievement test consisting of 50 items were prepared. The draft form of the achievement test in science is given as Appendix IX. The draft achievement test was administered on a sample of 100 standard IV children of different schools in Alappuzha and Kottayam districts. The answer sheets of all the 100 subjects were scored and arranged in the descending order of scores for item analysis. The top 27 percent in the group (the top 27) when arranged in the descending order of the total scores and the bottom 27 percent (the bottom 27) alone were used as extreme groups for item analysis. The scores obtained for each item in these extreme groups were used for calculating the discriminating power of each item. The discriminating power was obtained by calculating the critical ratio 't'. For the preparation of the final test the best 36 items having the highest 't' value in the group were selected. The 't' values of the items in the draft test are given in Table 4.3.

Table 4.3

't' values Obtained for the Draft Test of Achievement in Science

SI.No.	't' value	SI.No.	't' value
1.	6.32*	26.	4.86*
2.	4.25*	27.	9.46*
3.	4.36*	28.	2.00
4.	1.11	29.	3.24*
5.	1.22	30.	12.34*
6.	3.76*	31.	1.67
7.	4.22**	32.	6.34*
8.	2.10	33.	8.41*
9.	3.31*	34.	1.22
10.	9.42*	35.	2.89*
11.	6.24*	36.	5.34*
12.	1.98	37.	4.11*
13.	2.02	38.	2.21
14.	3.48*	39.	6.32*
15.	5.24*	40.	8.42*
16.	10.31*	41.	7.34*
17.	1.54	42.	1.23
18.	12.52*	43.	9.34*
19.	7.19*	44.	7.29*
20.	1.99	45.	5.56*
21.	3.46*	46.	1.94
22.	5.76*	47.	5.64*
23.	2.68*	48.	9.41*
24.	1.23	49.	4.59*
25.	8.32*	50.	7.16*

* indicates selected items

Thus, an achievement test in science consisting of 36 items in different categories was prepared for final administration. The duration of the

test is fixed as two hours and maximum mark is 50. The first part consists of 10 questions bearing $\frac{1}{2}$ mark for each question. In this section, three alternatives are given in brackets. The subject has to select the correct answer from among the alternatives given in brackets. Question Nos. 11 to 15 are questions bearing one mark each. Question Nos. 16 to 18 are fill in the blanks type and carries one mark each. The next three questions, question Nos. 19 to 21 asks the subject to write whether the statements given are right or wrong. It carries one mark each. In question Nos. 22 to 24, four items are given. The subject has to separate the one which won't suit the rest of the items. These questions also carry one mark each. An example is given below.

E.g. Boat., Net, Hook, Axe.

Ans. Axe.

Question Nos. 25 to 29 is match the following. These questions carry one mark each. Next two questions (question Nos. 30, 31) are of answering in one or two sentences. These questions carries $2\frac{1}{2}$ marks each. Question Nos. 32 to 34 are of answer in three or four sentences type. These questions carry three marks each. In question No. 35, a picture consisting of eight legs of different birds are given. The subject is asked to select 4 legs from these and identify the birds. They are also asked to write how these birds use their legs to gather food. This question carries five marks. In the last question, some products which we use in our daily life and the place of manufacturing of these products are also given. The subject is asked to

identify the place where most of these products are made and to make a project report of the same. This question carries five marks.

The final form of the achievement test in science and its scoring key are given as Appendix X and Appendix XI and its English version is given as Appendix XII.

4.5.4 Validity and Reliability of the Achievement Test in Science

The concurrent validity of the test was ensured by correlating the test scores with the class examination marks of 100 students selected at random from standard IV, for the purpose of validating the test. The class examination marks were collected from the progress report of the concerned students from the school. The validity coefficient was found to be 0.65. This shows that the test is reasonably valid for the purpose for which it is constructed.

The reliability coefficient of the test was determined by the Split-Half method was 0.69, the coefficient of correlation corrected by the Spearman-Brown Prophecy Formula was found to be 0.74. The Test-Retest reliability of the test with one month interval was found to be 0.75. This shows that the test of achievement in science is a reliable tool for measuring science process skills of pupils studying in IV standard.

4.5.5 Diagnostic Test to identify the Disorders of Reading and Writing

To find out the disability in reading and writing in children of standard IV, the investigator constructed a diagnostic test in language. Before constructing the test, the investigator consulted experts in the field of education of the learning disabled and went through some of the tests constructed by them. Their advice in constructing a diagnostic test to identify the disorders of reading and writing were also elicited. Keeping in mind their advice, the textbook prescribed for standard IV in Malayalam was relied upon for the construction of the test to ensure the curricular validity of the test. The test was prepared by giving proper weightage to reading and writing. The investigator prepared 32 items for the test and this was again submitted to the experts in the field of education of the learning disabled and primary school teachers who are teaching Malayalam. Based on their suggestions, some items were modified and some were deleted. Thus, a draft form of the test with 25 sections incorporating questions for reading and writing was constructed. The draft form of the diagnostic test is given as Appendix XIII.

The draft diagnostic test in Malayalam was administered on a sample of 100 standard IV children of different schools in Alappuzha and Kottayam districts. The answer sheets of all the 100 subjects were scored and arranged in the descending order of scores for item analysis. The top 27 percent in the group (the top 27) when arranged in the descending order of the total scores and the bottom 27 percent (the bottom 27) alone were used

as extreme groups for item analysis. The scores obtained for each item in these extreme groups were used for calculating the discriminating power of each item. The discriminating power was obtained by calculating the critical ratio 't'. For the preparation of the final test the best 16 items having the highest 't' value in the group were selected. The 't' values of the items in the draft form of the diagnostic test to identify the disorders of reading and writing are given in Table 4.4.

Table 4.4

**'t' values Obtained for the Draft Form of the Diagnostic
Test to Identify the Disorders of Reading and Writing**

Sl.No.	't' value	Sl.No.	't' value
1.	8.43*	14.	4.86*
2.	4.25*	15.	9.46*
3.	5.60*	16.	1.68
4.	1.23	17.	7.80*
5.	9.55*	18.	1.92
6.	8.26*	19.	8.45*
7.	1.64	20.	6.34*
8.	3.45*	21.	8.41*
9.	5.65*	22.	1.65
10.	2.12	23.	1.98
11.	4.45*	24.	5.34*
12.	1.92	25.	4.11*
13.	1.29		

** indicates selected items*

Thus, a final form of the test consisting of sixteen sections was prepared for administration. The maximum marks allotted for the test is 150. The maximum time required to complete the test is 3½ hours. The test was administered in appropriate intervals. Thus, a minimum of six periods were required to complete the test.

The first part of the test consists of certain letters which are to be written by the student when the teacher reads them. Fifteen marks are assigned to this part. In the second part, 25 words are given. The teacher should read the words loudly and clearly and the student should write them correctly. This part carries twenty five marks.

In the third part, 18 words are given. The student is asked to read the words without mistake. The total mark assigned to this part is 18. The fourth part of the test consists of eight questions. The student is asked to fill up the blanks in each question with the appropriate form of the word given in brackets. This part carries eight marks.

The fifth part is for testing the writing ability of the student. Here, the student is asked to write in five sentences about Onam, the national festival of Kerala. Two and a half marks are assigned to this part. In the sixth part, some letters are given in boxes. The student is supposed to write meaningful words using these letters. The marks assigned to this part are four.

Some words are given in boxes in the seventh part. Here, the student is asked to split the word meaningfully into two words. An example is also given. Five marks are assigned to this part. In Part VIII, five words are given in a circle. Five words are given outside the circle also. The student is asked to fill up the blank against each word in the circle with suitable word from the one given outside the circle. This part also carries five marks.

Next part (Part IX) carries 10 marks. Here the student is asked to recite the words given and separate the word which are not found rhythmic by putting a 'x' mark. In part X there are 10 words. A letter is given in bracket with every word. The teacher should spell each word and the students should spell and write the word by eliminating the one given in bracket. All the words are meaningful even without the letter in bracket. This part is given 10 marks.

Next part (Part XI) tests the reading skill. Here also some words are given and the student is asked to read the words. The words which are not rhythmic are to be indicated by putting circle over the word. Ten marks are assigned to this part. Part XII consists of nine words. Here, the teacher is asked to make the student read the words loudly. Each correctly read word carries one mark.

Part XIII is a passage with a poem at the end of it. The student is asked to read the passage loudly. It carries 2 ½ marks. Next part (Part XIV) is also a passage. The student is asked here to read the passage carefully and answer the questions given at the end of the passage. The five

questions carry two marks each. Part XV and Part XVI are also passages. The student should answer the questions at the end of each passage. The marks assigned to these parts are six and 10 respectively.

The final form of the diagnostic test to identify the disorders of reading and writing and its scoring key are given as Appendix XIV and XV.

4.5.6 Validity and Reliability of the Diagnostic Test to Identify the Reading and Writing Disorders

The concurrent validity of the test was ensured by correlating the test scores with the class examination marks of 100 students selected at random from standard IV, for the purpose of validating the test. The class examination marks were collected from the progress report of the concerned students from the school. The validity coefficient was found to be 0.63. This shows that the test is reasonably valid for the purpose for which it is constructed.

The reliability coefficient of the test is determined by the Split-Half method was 0.76, the coefficient of correlation corrected by the Spearman-Brown Prophecy Formula was found to be 0.79. The Test-Retest reliability of the test with one month interval was found to be 0.75. This shows that the diagnostic test for identifying learning disability in reading and writing is a reliable tool for measuring language learning disability of pupils studying in IV standard.

4.5.7 Diagnostic Test to Identify Mathematical Disabilities

The investigator prepared and standardised a diagnostic test to identify the mathematical disabled children in standard IV. Before the construction of the test, the investigator consulted experts in the field of education of the learning disabled and went through the tests constructed by them to identify mathematical learning disabilities (dyscalculia). For the construction of the test, the syllabus prescribed for standard IV mathematics was used. The investigator prepared 70 items based on the syllabus and it was again submitted to the experts in the education of learning disabled and teachers teaching mathematics at primary level. Their suggestions were incorporated by modifying some items and deleting some. Thus, a draft form of the test with 50 questions was prepared. The draft form of the diagnostic test in mathematics is given as Appendix XVI.

The draft test to identify the mathematical disabilities was administered on a sample of 100 standard IV children of different schools in Alappuzha and Kottayam districts. The answer sheets of all the 100 subjects were scored and arranged in the descending order of scores for item analysis. The top 27 percent in the group (the top 27) when arranged in the descending order of the total scores and the bottom 27 percent (the bottom 27) alone were used as extreme groups for item analysis. The scores obtained for each item in these extreme groups were used for calculating the discriminating power of each item. The discriminating power was obtained by calculating the critical ratio 't'. For the preparation of the final test the best 40 items having the highest 't' value in the group were selected. The 't' values of the items in the draft test are given in Table 4.5.

Table 4.5
't' values Obtained for the Draft Test to Identify Mathematical Disabilities

Sl.No.	't' value	Sl.No.	't' value
1.	8.42*	26.	2.01
2.	5.65*	27.	3.40*
3.	4.45*	28.	5.86*
4.	1.26	29.	7.26*
5.	1.12	30.	9.44*
6.	3.76*	31.	6.60*
7.	4.22**	32.	1.60
8.	1.98	33.	7.50*
9.	3.61*	34.	2.98*
10.	7.56*	35.	1.99
11.	4.34*	36.	9.34*
12.	2.08	37.	4.11*
13.	3.29*	38.	6.54*
14.	4.56*	39.	3.30*
15.	5.50*	40.	7.40*
16.	10.31*	41.	6.34*
17.	3.81*	42.	3.45*
18.	1.88	43.	1.11
19.	6.20*	44.	8.54*
20.	4.32*	45.	7.56*
21.	1.30	46.	1.88
22.	4.76*	47.	5.64*
23.	2.59*	48.	10.43*
24.	6.78*	49.	1.23
25.	5.50*	50.	7.11*

* indicates selected items

Thus, a final form of the test consisting of 40 items was prepared. The mathematics diagnostic test carries a maximum mark of 150. The maximum time required to complete the test is 3 hours. The test was

administered in appropriate intervals. Thus, a minimum of five periods were required to complete the test.

The test covers all the aspects of mathematics calculations such as subtraction, addition, division and multiplication. All the forty questions are framed in such a way that learning disability in mathematics (dyscalculia) can be identified by administering the test.

The final form of the diagnostic test to identify the mathematical disorder (dyscalculia) and its scoring key are given as Appendix XVII and Appendix XVIII and its English version is given as Appendix XIX.

4.5.8 Validity and Reliability of the Diagnostic Test to Identify Mathematical Disabilities

The concurrent validity of the test was ensured by correlating the test scores with the class examination marks of 100 students selected at random from standard IV, for the purpose of validating the test. The class examination marks were collected from the progress report of the concerned students from the school. The validity coefficient was found to be 0.63. This shows that the test is reasonably valid for the purpose for which it is constructed.

The reliability coefficient of the test is determined by the Split-Half method was 0.74, the coefficient of correlation corrected by the Spearman-Brown Prophecy Formula was found to be 0.77. The Test-Retest reliability of the test with one month interval was found to be 0.79. This shows

that the diagnostic test to identify learning disability in mathematics is a reliable tool for measuring the mathematical disability (dyscalculia) of pupils studying in IV standard.

4.5.9 Raven's Coloured Progressive Matrices A, Ab and B

Raven's coloured progressive matrices (CPM, 1986 edition) sets A, Ab and B developed by Raven was used to measure intelligence of the standard IV children. This test was used because it was quick and easy to administer. This test is constructed by omitting Sets C, D and E of the Raven's Standard Progressive Matrices (SPM) and by adding another set of 12 problems (Set Ab) between sets A and B. This test is designed to assess with greater precision the intellectual processes of young children between the age group 5-11. The coloured backgrounds on which the problems are printed attract attention and make the test spontaneously interesting. These tests are made up of a series of diagrammatic puzzles exhibiting serial change in two directions simultaneously. Each puzzle has a piece missing, which the person taking the test is required to find. Success in Set A depends on a person's ability to complete continuous patterns which, towards the end of the set, change first in one, and then in two, directions at the same time. Success in Set Ab depends on a person's ability to see discrete figures as spatially related wholes, and to choose figures which complete the design. Set B contains just sufficient problems involving analogies to show whether or not a person is capable of thinking in this way. The test was designed in such a way that the

instruction should be read aloud, especially to people with reading and other related difficulties. The investigator, while administering the test, gave precision instructions very clearly. There is no specific time limit for the test. While administering the test, the investigator found that 25 to 30 minutes are enough to complete the test. The total score of an individual is taken as an indicator of his/her intelligence. A separate answer sheet was provided to mark the answer. The answer sheet is given as Appendix XX.

Validity and Reliability

All factor analytical studies show that the test is a good indicator of intelligence. Concurrent validity coefficients between the Coloured Progressive Matrices test and Stanford -Binet Intelligence Scale and Wechsler Scale range between 0.54 and 0.88, with the majority in the range of 0.70 and 0.80.

The reliability of the test was assessed by many researchers. The reliability coefficient of the test was seen situated between $r = 0.85$ and 0.90 . The test-retest reliability was found to be $r = 0.80$ in most studies.

4.6 PROCEDURE ADOPTED FOR THE STUDY

The investigator sought the permission of the school authorities to collect data from their institutions before administering the tools. He explained to the heads of the institutions and teachers about the various tools to be administered and the relevance of each tool in identifying the learning disabilities of children, the time required for administration of tools for ensuring

better cooperation. The tools were administered personally by the investigator. Due care was taken in administration of the tools in all the schools selected for data collection. Clear and accurate instructions regarding the time limit as well as the details to be filled-up in the answer sheets was given to the subject prior to the administration of the tools. The data thus collected were consolidated and analysed using appropriate statistical techniques.

4.7 STATISTICAL TECHNIQUES USED FOR DATA ANALYSIS

1. Test of significance of difference between means (Critical Ratio)
2. Pearson's product moment coefficient of correlation (r) (Garrett, 1947).

4.8 IDENTIFICATION OF LANGUAGE LEARNING DISABLED AND NON-DISABLED

The language learning disabled and non-disabled were identified by administering the diagnostic test prepared by the investigator to identify the disorders of reading (dyslexia) and writing (dysgraphia). The scores obtained through the test was classified by finding its mean and standard deviation. Those getting scores below $M-\sigma$ are classified as learning disabled and the rest as non-disabled. Table 4.6 shows the number and percentage of language learning disabled and non-disabled.

Table 4.6**Classification of Language LD and ND Children**

Group-	No. of Students
Language LD	40 (6.50%)
Language ND	574 (9.350%)

4.9 IDENTIFICATION OF MATHEMATICS LEARNING DISABLED AND NON-DISABLED

The mathematics learning disabled and non-disabled were identified by administering the diagnostic test prepared by the investigator to identify the disorders of mathematical disability (dyscalculia). The scores obtained through the test were classified by finding its mean and standard deviation. Those getting scores below $M-\sigma$ are classified as learning disabled and the rest as non-disabled. The following Table shows the number and percentage of language learning disabled and non-disabled.

Table 4.7**Classification of Mathematics LD and ND Children**

Group-	No. of Students
Mathematics LD	77 (12.50%)
Mathematics ND	523 (87.50%)

4.10 IDENTIFICATION OF THE LEARNING DISABLED AND NON-DISABLED CHILDREN

The language learning disabled and mathematics learning disabled were computed as mentioned above. The total of the language learning disabled and mathematics learning disabled was taken as the learning disabled (total) of the sample. The number of learning disabled and non-learning disabled (total) in the sample is given Table 4.8.

Table 4.8

Classification of Learning Disabled and Non-disabled Children

Group-	No. of Students
Learning disabled	117 (19%)
Non-disabled	497 (91%)

The analysis of data obtained by administering the tools is presented in the next chapter.

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