Chapter-III

METHODOLOGY and DESIGN
Methodology and Design

Research mainly depends on the methodology and design adopted in the study. A well-organized and good research always follows sound methodology and procedures which includes the appropriate strategy in step execution of the investigation, which further helps in finding of the study and generalization of facts. So it is desirable to draw a plan for the study to provide answer to research questions. In this chapter an attempt has been made to provide a brief theoretical description of sample and procedures of collection of data which has been followed in the present study.

3.1 Design of the study

The present study is an experimental research which is followed by testing of special strategies of teaching on reading, writing and arithmetic to learning disabled children. Experimental research tries to establish 'a systematic and logical association between manipulated factors and observed effects' (Lokesh Koul, 1997 p. 466). Advantage of using experimental research is that it helps researcher to control the variables, provide insight into the method of instruction and determines what would be best for the population; while disadvantages/have been overlooked. The investigator has used this method so as to know whether strategies used for teaching the learning disabled children of class III in Barak valley has any effect or not; and whether the strategies would be applicable in classroom teaching in this area.

True experimental design was adopted for the study. Experimental design is regarded as blueprint of the procedure which helps the researcher to test the hypotheses by finding valid conclusion about the relationship between independent and dependent variables.

In the study the independent variables are the teaching strategies; while dependent variables are the skills (reading writing and arithmetic).

There are four types of experimental design, among which pre-test and post-test experimental design was used. This design helps in understanding effect of the dependent variables caused by independent variables and the difference between the score conducted before and after imparting the treatment upon learning disabled children who were randomly divided into two groups (experimental group and control.
The experimental group was taught with special strategies along with traditional method while control group was taught only with traditional method but undergoing the tests as experimental group.

The study intends to test the academic development of learning disabled children after imparting special strategies through teaching in 3R's.

3.2 Sample

The representative of the total population is sample. The student of class-III of government schools from Barak valley has been taken as the sample for the study. Approximately three-four thousand primary schools are there in the valley.

The present study was based on non probability sampling where it means a particular unit of the universe is chosen for constituting a sample on the basis that the small mass represents the whole. It is estimated that five to fifteen percent school going children are affected by learning disability. In this study the investigator has included just a few children for the study.

Based on non-probability sampling, purposive sampling method was utilized to select the sample. Purposive sampling is used when the researcher has specific purpose for conducting the study. The total sample of the study comprised of one-twenty learning disabled children selected from regular Bengali medium school going children of class-III having average intelligence.

3.3 Criteria for sample selection

The study included a sample of children who were deficit in all the 3Rs (reading, writing and arithmetic). The following criteria were used for the identification of sample from the regular schools:

- Average intelligence.
- Exclusion of seasonal handicaps.
- Performance equal to or above a score of 40 on Questionnaire for Identification of learning disabled children.
- Forty percent or more on academic performance.
- Age between 8-9 years.
3.4 Procedure of sample selection

Based on consent of the head of the institutions, the schools were selected for the study. Research tools were developed by the investigator for selection of the sample. Description of the tools – The investigator developed three sets of questionnaires for measuring the effect of strategies on learning disabled children. The questionnaires were developing to suit the disabled children of Barak Valley. As the schools were Bengali medium, the children were poor in English; hence the investigator developed the questionnaire in simple language both in English and Bengali (English for measuring reading and writing skills and Bengali for arithmetic skill).

The tools used:

- Intelligent test (developed by the investigator)
- Questionnaire for Identification of Learning Disabled Children (developed by the investigator).
- Questionnaire for Identification of Specific Learning Disabled Children (developed by the investigator).

3.4.1 Intelligent test:

The first test to measure the intelligence was developed by Sir Francis Galton. The intelligent test which is mostly in use was formulated by the French Psychologist Alfred Binet. The best known and widely used revision was made by Terman at Stanford University in 1916, commonly referred to as the Stanford Binet.

Intelligence is a general capacity for comprehension and reasoning that manifests itself in various ways. Intelligent test are used to assess the intellectual level of the children. Definition reveals that the learning disabled children have average or above average IQ (Intelligent Quotient). Kimbuly L. Kicth, in the article ‘Intelligent Tests used in assessment for learning disabilities revealed that assessment of learning disabled children vary among school districts and examiners.

Most of the standardized test is of English language which most of the times are unsuitable for students, basically those who are taught with their mother-tongue.
India is a multilingual and multicultural country where it has fifteen official languages and 1600 dialects are spoken whole over. In Barak Valley the most spoken and used official language is Bangla.

Thus investigator developed the intelligent test for the children both in English and Bengali related to their level of knowledge and syllabus. The questionnaire was finalized after three drafting.

**First draft of Intelligent test –**

The intelligent test which was developed by the investigator formerly contained fifteen items. The questionnaire was consulted with experts (supervisor and government schools teachers). The experts suggested to reduce the items as it would be too many, and all of them viewed of keeping ten items in the questionnaire and keeping score up to 100. They suggested of including general knowledge questions also. Question 10 – Simple math included only addition and subtraction; was asked by experts to include all the mathematical symbol calculation instead of addition and subtraction.

**Seconds draft –** With the viewpoints of the experts, the investigator modified the intelligent test in following –

The five times which were omitted from the questionnaire i) Match the persons in relation to its occupation. 2) Spelling test. 3) Give another word 4) Dictation 5) Problems (mathematics). The general knowledge question was included – ‘Write five non-living things and living?’

These questionnaires were given to ten children for their response. It was found that most of the children got confused in one of item (Question 3 – Write down the synonym for the word?) and (Question 4 – Write the related word?).

As children got confused in items ‘3 and 4’, the investigator modified the question. Instead of those questions, the investigator put forward the question as ‘choose the correct word, replacing question no 3; and in question no. - 4 fill in the blank (A - Z) was included.
Question number 10 was modified including calculation of addition, subtraction, multiplication and division.

Third time the test was positive.

**Final draft** – The same questionnaire was again given to same ten children to find its final approval, the item were the same, but numbering was different.

After getting positive response from the children, the investigator finalized the test for her study. The questionnaire contained ten items relating to general knowledge, reading, writing and arithmetic with the total score of hundred (100).

**Administration and instruction** – A brief talk was given to the class after giving them the questionnaire, so as to help them in writing their answers. No time limit was given to them.

**Scoring of items**

Item 1 to 2 of the questionnaire are related to general knowledge, and each item has ten problems carrying one mark.

Item 3 to 4 of the questions are based on recognition of words and pictures each item has eight problems and carries one mark each.

Item 5 to 6 of the questionnaire deals with spelling, each item having eight problems and carrying one mark each.

Item 7 is related to mathematics, and has twelve problems it, each carries one mark.

Item 8 have seventeen problems, which are related to joining of numbers and each carrying one mark.

Item 9 and 10 has eight problems each related to addition and subtraction, each carrying one marks.

The format of the final questionnaire with proper scale was given to the children of a particular school, for its reliability.

Through spilt-half method the reliability of the test was found to be as 0.94 level.

The questionnaire of Intelligent test has been given in appendix no.1
3.4.2 Questionnaire for Identification of Learning Disabled:

Children usually exhibit vast intra-individual differences in their learning profile. Teachers and parents reveal that there are a few children who despite being motivated and intelligent fail to perform well in school.

Lyon (1994) study found that not everyone who has academic problems has a learning disability, but a thorough examination determines the presence of developmental learning disability.

The tool, ‘Questionnaire for Identification of Learning Disabled Children’ helps the investigator to thoroughly identify the learning disabled children of a particular class. Before the development of final questionnaire, the questions were drafted for several times so as to suit the children and which would help the investigator to identify the learning disabled children.

**First draft** – A questionnaire was prepared which consisted of items related to the skills. There were six items in the questionnaire. The questionnaire was so constructed for reflecting the learning disabled children.

The questionnaire was consulted with the government school teachers (experts) and supervisor. They approved the six items but advised to increase the items at least ten items should be in the questionnaire.

**Second draft** – The modified questionnaire consisted of ten items relating to the 3R’s and one item relating to general knowledge was developed by the investigator. Each skill were included.

Preliminary try out – The questionnaire was administered to a sample of ten children of class III. The children who were given the Intelligent test, were given this questionnaire again. The nature of items was explained to students and they were asked to remove their doubts whenever there was any difficulty for them in the understanding of the items.

During try out the investigator found difficulty in rating fluency of the children as a paragraph was given to them to read. The investigator consulted with the expert of replacing the paragraph to a sentence for accurate rating.
Afterward, the responses of children were rated accordingly to the weight assigned to each item.

**Final draft** – After close scrutiny, final draft of the questionnaire was prepared having ten items, for standardization, it was given to the class III children, no correction was made in any other items except in fluency rating. A short sentence was given to read.

**Administration and instruction** – A brief orientation talk was given before distributing the questionnaire to the children. No time limit was given. However, it has been found that generally it takes a period of twenty to twenty-five minutes.

**Scoring of the items** – The items in the questionnaire are divided into four parts – general knowledge (G.K.), reading, writing and arithmetic.

Item 1 deals with general knowledge having twenty-six problems and each carrying half mark each.

Item 2 deals with fluency, carrying ten marks. Here, a child taking more than three seconds for one word, allotted marks get deducted.

Item 3 and 4 deals with recognition, each items having ten problems and carrying one mark each.

Item 5 deals with handwriting and carries ten marks.

Item 6 and 7 deals with spelling, each item had eight problems, carrying one mark each.

Item 8 to 10 deals with mathematics, each item has ten related problems, and each carrying one mark.

With the final scoring and modified questionnaire, it was again given to the children for finding the reliability.

**Reliability of the questionnaire** – The test-retest reliability administered upon ten subjects and with a gap of 14 days.

0.83 reliability has been found through the test.

The final questionnaire has been attached in appendix no 2.
3.4.3 Questionnaire for Identification of specific hearing disabled children:

Learning disability is a term which tries to identify children having severe discrepancy between ability and achievement. A learning disabled child is one who has one or more significant deficits in learning process and he or she requires special strategies for its remediation. Learning disabilities include difficulties in reading comprehension, writing, spelling, thinking, listening, arithmetic and these disorders can be found in large number of children having normal range of intelligence.

Berdine and Blackhurst (1985) put forward some basic dimensions related to disorder which are – discrepancy, deficit, focus and exclusion.

Children who do have deficit only in achievement would not be learning disabled, while single or common characteristics of children with learning disabilities is a specific and significant achievement deficiency in the presence of adequate intelligence.

Learning disability can be of various types–

(1) Dysgraphia – dealing with writing.

(2) Dyslexia – deals with reading.

(3) Dyscalcula – deals with arithmetic.

In relation to this main types of learning disability, there are other terms which are often used in literature namely agnosia, aphasia, dyspraxia, apraxia, etc. to describe some categories of these children.

In this study, the investigator is concerned with children having difficulties in all the 3R’s (reading, writing and arithmetic).

First draft – The questionnaire consisted of ten items, each skill having three items, suggestion of the experts decreased the items of the questionnaire. The experts suggested giving questionnaire having six items, each skill having two items and total marks carrying of sixty, as it would help the investigator to mark properly.

Thus, the investigator omitted dictation, problem solving, and choosing the correct word. Modified questionnaire was given to same ten children.
Second draft – The selected children were made comfortable, before providing them the questionnaire. Questionnaire contained six items each carrying ten marks. The student had problem in item no.2, ‘Circle up the vowels from the given word?’. They were unable to recognize the alphabets, while they did not find difficulty in other items.

The item no 2, of the questionnaire was omitted, instead fill in the blank was included; other questions were kept same.

Third draft – With the corrected item, the children were again given the questionnaire for their response. This time there was no problem, and they responded to the questionnaire very easily. Seeing the positive response of the children and experts for the questionnaire the investigator selected the questionnaire as final one.

Final draft – After ten days, the questionnaire was again given to the ten children for their response, for its standardization all the children answered in positive without any problem in understanding the questionnaire, except one child had problem in item no. 3, ‘Write the given sentence for five times’. In that item, she wrote five sentences about herself that in Bengali.

The investigator consulted with the experts in regard to this item no. 3, but they all suggested of keeping the items same.

Administration and instruction – Before giving the student the questionnaire, the investigator made them understand the procedure of writing the items. No time limit was given to the student.

Scoring of the items – The items of the questionnaire divided into three parts (a) reading, (b) writing, (c) Arithmetic.

Reading – The scale contained two items, relating to two different categories–

Item 1 – related to word recognition (included fill in the blanks). It contained ten problems and each carrying one mark.

Item 2 – is concerned with fluency (paragraph reading, having ten marks). A child taking more than three seconds for one word, allotted marks gets deducted.
Writing – The scale includes two items relating to two different categories.

Item 3 – relates to handwriting. (Sentence writing). In this item five sentences were asked to be written seeing the above sentence, and each carried two marks.

Item 4 – is related with spelling (jumble words). It consist ten problems, each carrying one mark.

Arithmetic – The scale includes two items of two different categories (A) recognizing the symbols and (B) use of symbols.

Item 5 – relates recognition (solving problems). Ten problems consists the item ad each carrying one mark.

Item 6 – relates to use of symbols (solving problems). Simple ten problems consisted the item and carrying one mark.

For reliability of the questionnaire, it was again given to the same ten children with totally modified.

Reliability of the questionnaire – The split-half reliability test has been administered upon ten children with the gap of fourteen days.

0.85 reliability has been found through the test.

The same questionnaire was used both for pre-test and post-test for the learning disabled children. In case of pre-test questionnaire helped in selecting the specific learning disabled children. Later in case of post-test, difference in its score were measured to observe the effect of strategies.

The questionnaire has been attached in appendix no 3.

3.5 Special strategies used for teaching:

The investigator used special strategies for teaching the learning disabled children. As the student were of class III, simple strategies were been used for their academic improvement through which they can easily cope with normal school learning.
In relation to the three main skills reading, writing and arithmetic; five strategies were used. Each of the strategies was used to make the teaching process more efficient and easy for learning disabled children. Each of the strategy was related to different component of the skills.

Five strategies were –

1. Reading
   - Word recognition — Fading strategies
   - Fluency — Active voice strategies

2. Writing
   - Handwriting — Cursive strategies
   - Spelling — Multisensory strategies

3. Arithmetic
   - Recognition of symbol
   - Used of symbol — Computer based strategy

**Fig. 3.1 : Skills and strategies**

### 3.5.1 Fading strategy:

This technique is been regarded as one of the best technique for memorization which helps in word-recognition. This technique was taken from the book ‘Strategies for teaching students with learning disabilities’ by Lucy C. Martin (2009).

The picture fading technique method was used by Dorry and Zeaman (1975) where words taught through association with pictures and gradually faded after a series of repetition.

According to Martin (2009) method a word was taught to the children with proper pronunciation, later each alphabet was omitted from the word. Example :

<table>
<thead>
<tr>
<th>WORD –</th>
<th>(1) A P P L E</th>
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<td>(2) A P P L –</td>
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<tr>
<td></td>
<td>(3) A P P – –</td>
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<tr>
<td></td>
<td>(4) A P – – –</td>
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<tr>
<td></td>
<td>(5) A – – – –</td>
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<td></td>
<td>(6) – – – – –</td>
</tr>
</tbody>
</table>
This process continued until the child was able to spell the words correctly. The technique seemed to be more effective for the children.

**First trial** – The technique was first of all discussed with the expert for using upon the children. One of the expert recommended of using flashcards, but other agreed upon this method as it would be something different. They even suggested using alphabetic cubes while teaching the words.

**Second trial** – This method was used upon earlier ten children of a particular school. They were asked to select few words from the Chapter 1 of the English book ‘Marigold Book Three (Textbook in English for Class III). The investigator at first made them learns the alphabets and then the words were taught using the strategy.

One by one alphabet was omitted and children were asked to answer. The children showed positive response to this strategy. They learnt the alphabet along with the words.

Their response sheet was taken into account for approval of the strategy.

**Final trial** – After ten days again these children were tested, in accordance to see whether the strategy helped them to learn the words or not.

Seeing the children’s satisfactory response, the investigator took this strategy for teaching word-recognition.

### 3.5.2 Active voice strategy:

A poor reader is evidenced by slow, halting and inconsistent rate; poor phrasing and adequate intimation patterns; while fluent reader is able to read orally with speed, accuracy and proper expression. Reading aloud helps the reader to use appropriate phrasing, intonation and their oral reading mirrors their spoken language (Pamela E. Hook & Sandra D. Jones, 2002).

Fluency is often regarded as stepping-stone to comprehension and fluency training helps a reader to connect spoken language to the features of test that are signalled through punctuation.
Thus, the investigator has used active voice strategy for development of fluency on learning disabled children. Active voice strategy was taken from ‘Strategies for teaching students with learning disabilities’ by Lucy C. Martin (2009). According to this strategy, the investigator reads the material aloud while the students listen carefully with their finger on the study material. After that, the child reads the material aloud with proper pronunciation and punctuation and the investigator provides feedback along with its reading.

**First trial** – Before selecting active voice strategy, it was discussed with the experts for their opinion. The investigator demonstrated using of the strategy before the experts. Along with the reading sentence, the investigator provided the meaning of the sentence, so that it makes understanding of the material more easy and simple. The experts gave positive feedback to the strategy.

**Second trial** – Getting the response of the expert, the investigator selected same ten learning disabled children from a particular school. The investigator used the strategy, ‘active voice’ on these children; she selected Chapter 1 from English textbook ‘Marigold Book Three’. Firstly, she read the text slowly and aloud so that the children hear every word properly and clearly, along providing them the meaning of the sentence and if necessary with example. After that, one by one child was asked to read the same text aloud, while the investigator corrected the mistakes. The process continued for five days and on the last day, their reading rate was checked by the investigator and their English teacher (Expert).

The children and the expert gave positive response to the strategy.

**Final trial** – After ten days, these children were again tested, the investigator gave them a paragraph to read while she noted down their rate of reading the paragraph.

Later, the earlier reading and the final reading rate was observed, it was found that six of the children’s reading rate increased to a very certain extent, while other two were the same as before, and the last two reading rate declined.

Again the strategy was discussed with the expert reviewing the response rate of the children. As six of the children’s reading rate increased, the expert suggested of using this strategy.
Thus, active voice strategy was used to increase fluency of the learning disabled children.

3.5.3 Cursive strategy:

Cursive strategy is often used for improving handwriting skill of learning disabled children. Cursive writing is sometimes called as script, where letters are connected. In very few schools, cursive writing starts in the third grade although a school teaches cursive as late as fifth grade.

Cursive style of handwriting is recommended by the British Dyslexia Association, in cursive, letters are produced in flowing movement starting from the same place and flow from left to right reducing the reversal mix-ups such as w/m, b/d, and p/q.

The origin of the cursive method was associated with practical advantages of writing speed and infrequent pen lifting to accommodate the limitation of the quill. As cursive strategy is regarded as more appropriate writing strategy for developing handwriting of learning disabled children, hence investigator selected this strategy.

First trial – Before using the strategy with learning disabled children, the investigator consulted with the experts (government school teachers and supervisor). All of them agreed in using this strategy. They only suggested that instead of teaching writing a sentence, the investigator make them to learn the alphabets through cursive (both small and capital), and lastly, to teach how to write sentence.

Second trial – The investigator randomly selected ten students from a particular school. Cursive papers were given to these children, which contained alphabets. The investigator formerly holds their hand and showed them to write, they were asked to move their hand over the dotted letters. The session continued for one week, and on the last day, the children were asked to write a sentence, this was done to check out their handwriting development.

Positive response was gained to a certain level.

Final trial – Children were tested with the strategy. They were asked to write a sentence for five times.
This response sheet was rated by the class teacher, so as to find out the improvement of the children.

Cursive papers and books were taken during the final teaching process.

3.5.4 Multi-sensory strategy:

Spelling makes reading and writing more efficient for the learners. The student with poor reading habits is always poor in their spelling. Herderson (1985) study found that there are individuals who are not affected with learning disabilities do have spelling problems. Teaching spelling helps the pupil to write the words they need, it is regarded as the most accepted objective.

The most used method for teaching spelling for learning disabled children is multisensory method, which was developed in early 1930’s by Dr. Samuel Orton and Anna Gillingham. The Orton-Gillingham method is an out-growth of the Orton theory of reading disability (Orton, 1976). Multisensory method tries to remediate child’s problem by using multiple sensory system during the training process. This approach has been used to teach reading, writing and spelling by using units of sound or letter of alphabets (Gillingham and Stillman, 1968). Gillingham and Stillman (1965) in their study emphasized a close association among visual, auditory, kinesthetic instruction. They employed a phonetic approach to reading and spelling.

The acronym VAKT, which is formed from the first letter of the words, visual, auditory, kinesthetic and tactile are senses which are reinforce during learning through multisensory strategy. Research suggests that learning disabled children taught through this strategy help them to learn more easily, faster and can retain and apply more readily in future learning.

Thus, the investigator thought of using this strategy for developing spelling of learning disabled children.

First trial – The strategy was discussed with the experts for their opinion. All of them gave a positive response.

Second trial – Ten learning disabled students were selected from a particular school for the study, among which five were kept aside and other five children were
taught with multi-sensory strategy. The investigator gave them alphabetic cubes; through which they were asked to spell the words. After that each student were asked to spell their formation of word aloud, the mistake were corrected along with. Then, they were asked to write down the correct word in their exercise books saying the alphabets loudly in chorus.

The procedure continued for three weeks with seven-eight trials. On the last day, spelling test was conducted on these children and they showed a lot improvement.

**Third trial** – All the ten students were given spelling test, it was conducted to measures the children performance. Positive response came from the test.

**Final trial** – After ten days gap, the same children were again tested, it was conducted to observe investigator's procedure of teaching along with the children level of understanding the strategy.

The student showed positive response towards the strategy and thus, the strategy was selected for the study.

### 3.5.5 Computer assisted strategy:

Learning disabled student often has difficulty with mathematics computation and problem solving. It is estimated that five to eight percent of school-age children are identified as having a math disability. For these students computer may be valued as a learning tool that diminishes frustration in mathematics.

Skinner (1968) in the study revealed that computer assisted instruction (CAI) is a man-machine relationship where the man is a learner and the machine (that is computer system) programmed with the purpose of inducing human learning and retention. Teneja (1991) described computer assisted instruction as use of a computer to assist in the presentation of instructional material to a student to monitor learning process/ to select additional instructional material {in}accord with the needs of individual learner Chandwick (1997) meta-analysis study on CAI found that CAI is more effective than conventional instruction for secondary mathematics.
Seeing the advantage of the computer and its use on learning disabled children, the investigator took it as strategy for teaching the mathematical disabled children. Studies have shown that computer is mostly used in teaching mathematics rather than any other subjects.

**First trial** – Before using the computer, the study materials were discussed with the experts (government school teachers) for their viewpoints. The material mainly consisted of addition and subtraction. But the experts suggested of making them teach numbers at the beginning and after that move to application of symbols addition and subtraction.

**Second trial** – Taking into account the suggestion of the experts, investigator formulated the material accordingly. Firstly starting with numbers and moving to recognizing ‘all the four basic symbols (+, −, x, /)’. After that, it showed the application of the symbols. Main concern was given on addition and subtraction. The material had numerous examples of using these two symbol (+, −). There were some unsolved problems, for the children.

The material was constructed in Bengali, as the children were from Bengali-medium schools. The material was displayed before the experts for their suggestion / recommendation.

**Third trial** – Getting the positive response from the experts. The strategy was used upon five students of Class III. They were excited of this technique and eagerly tried to learn it. After going through few trials, the students were able to recognize and use the symbols.

**Final trial** – After a gap of fourteen days, again the strategy was used, upon ten children to measure its effect. It was found, that children taught with computer performed positively compared than the other group who was kept aside.

Getting the positive reaction from the student, the investigator used the computer strategy for teaching the mathematical disabled children. The investigator used laptop for imparting the instruction. The material was only of visual aid.

Printed copy of power point presentation and CD has enclosed, appendix-4.

After finalization of tools and strategies, the investigator conducted her study.
3.6 Procedure for data collection:

The present study is an experimental study where the investigator used the special strategies for teaching the learning disabled children. The purpose of the study was–

- Pre-test.
- To familiarize with the administration of the tool.
- To assess the suitability of items in all questionnaires developed by the investigator.
- To assess the applicability of the strategies used for teaching the learning disabled children.
- Post test

Tools used for the study were developed by the investigator both in English and Bengali; English was used for reading and writing skills and Bengali for arithmetic skill.

3.6.1 The study was conducted in three phases:

- Selection of learning disabled children.
- Practise session using special strategies.
- Final test.

3.6.1.1. First phase – [Selection of learning-disabled children].

In this phase three tests were given to the children.

1. Intelligent test–This test was given to the whole class. The investigator communicated with the class in Bengali, so that the children would be able to understand the questionnaire and respond properly.

   Along with response sheet, the investigator used odd-even technique for selecting the children to read the sentence which was used for testing their fluency and rated them accordingly. Combining the scores of response sheet and fluency rate the children who scored sixty-five to seventy-five according to the intelligent scale was selected for the study. Almost three-fourth of the children score were between this ranges.
2. Questionnaire for Identification of Learning Disabled Children—The selected student from the first test (Intelligent test) was given this questionnaire. The questionnaire was used to identify the children who were learning disability. The students were asked to fill up the respond sheet and side by side, investigator asked one by one child for reading the paragraph and eventually noted down their reading points. Combining the reading points and response sheet score, the investigator found that there were some children having deficit in any one skill, some students having deficit in any two skills but the investigator selected those children only who had deficit in all 3R’s reading, writing and arithmetic. Only children who scored between forty and sixty were sorted.

Among the sorted children, the investigator took note of their academic performance (directly taking their ‘June Evaluation’ marks). Those children scoring between ten and fifteen out of twenty-five in their test were selected.

3. Questionnaire for Identification of Specific learning disabled Children—Based on the two earlier tests and academic performance children were selected and who were given this particular questionnaire. This questionnaire was mainly given to select those children only who were having deficit in all the three skills (reading, writing and arithmetic). The students were asked to fill up the response sheet properly, without giving them any time limit while the investigator rated the children fluency point as they read the given paragraph. The children who scored between twenty and thirty out of sixty in the questionnaire were sorted and others were rejected. From each school ten learning disabled children were selected and were divided into two groups (experimental and control) through odd-even technique. Each group having five number of learning disabled children included for the study.

Thus, twelve Bengali medium schools were selected for the study from Barak valley which constitutes of three districts- Cachar, Karimganj and Hailakandi; and four schools from each district were selected. The school of each district were taken from each direction (north, south, east and west) of the area.

The study included one-twenty learning disabled children from class-III of Bengali-medium school of Barak valley.
### Table 3.1: District wise selection of sample

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<th>District</th>
<th>No. of School</th>
<th>No. of children in a class</th>
<th>No. of rejected children</th>
<th>Selected children in a group</th>
<th>Total no. selected children</th>
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<td>12</td>
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Table 3.1: The table depicts the number of children in a particular class of each school and district; total number of ten learning disabled children were selected after rejecting the certain number of children from each class.

#### 3.6.2 Second Phase- Practice-session using special strategies

Among the two groups experimental and control, experimental group were separated from control group in this phase. Practise session for experimental group started from the month of August 2011 and continued till February 2012. Before the practise session started selected children were requested to abstain from absenting themselves, else they would miss some new and interesting process of activities.

Experimental group was taught by both traditional method and special strategies. Traditional method was taught during class hours while investigator taught the children during zero hour with special strategies. On other hand, the control group was taught only through traditional method.
Practice session was mainly for experimental group. The investigator interacted with the group both in English and Bengali, but mainly in Bengali for their understanding.

**Fig:** Design of the study
It shows the division of the group and the special strategies which were used for teaching experimental group in regard to three skills (reading, writing and arithmetic) along with traditional method; keeping control group aside.

Special strategies are –

i) Fading strategy for word-recognition.

ii) Active-voice strategy for fluency.

iii) Cursive strategy for handwriting.

iv) Multi-sensory strategy for spelling.

v) Computer-assisted strategy for recognition and use of mathematical symbols.

These strategies were used to improve academic skill among identified learning disabled children. Along with strategies investigator used some more materials which were— a) Alphabetic cubes, b) Picture charts (whenever necessary) c) Blackboard (most important) d) Cursive papers e) Pebbles and f) Number cubes.

Marigold BOOK THREE (Textbook in English for class III) developed by NCERT, New Delhi & adopted by SCERT, Assam was used by investigator for helping the learning disabled children in reading and writing skills. From the content of the English book, ‘Unit-5’, ‘The Balloon Man’ by the poet ‘Rose Fyleman’, ‘Page-43-46’ was selected, [appendix ]. As the investigator started her study after ‘June Evaluation’, so she preferred choosing this chapter. She tried to make children recite the poem along with making them learn the difficult words with its meaning.

The poem ‘The Balloon Man’ contained four stanzas, thus each stanza were taught in each week with proper rhyme and making them understand the meaning of each word of the stanza. The children were asked to mark the difficult or new words of the poem. With the help of picture charts and/or related example of the word the investigator made the children understand its meaning. Alphabetic cubes were used to make the children learn the letters and even they were asked to make simple words from the cubes. Fading strategy helped the investigator to understand whether the children have learnt the word or not. Fading strategy was followed by multi-sensory strategy which helped in memorization of the spelling. The investigator pronounces the word and the children repeated it orally and later wrote it in their exercise books.
After making the children understand the meaning of each word and line of the poem, the investigator recited the stanza. The children were made to recite the poem altogether loudly and clearly with proper expression along with the investigator. Later the investigator asked the children to recite one by one and accordingly the correction of pronunciation was made. The investigator used active voice strategy for making them understand pronunciation of each word.

Main concern given by investigator was in helping the children with word recognition, fluency and, handwriting, spelling. Cursive papers were given to children for practicing handwriting. Foremost children were taught to write the alphabets in capital and small through cursive pattern and later on they were taught how to write words and then, a sentence.

Word-recognition and fluency are concerned with reading skill, while handwriting and spelling were mainly concerned for writing skill.

For arithmetic skill, the investigator totally interacted with the children in Bengali. Chart, pebbles, number cubes along with computer was used for teaching the learning disabled children. Concentration was mainly given to recognition and use of mathematical symbols (mainly addition and substraction). The book ‘Ganith Jadu (3) Tritio Srani Ganithar Patho Pusthok, Prastakoran : Rashtriyo Sokhik Anushandhan O Prashikhan Parishad, Assam, Guwahati’ (পাঠ্য-সাধন ৩) তৃতীয় শ্রেণির গণিতের পাঠ্যগুলক, প্রস্তুতকরণ : রাষ্ট্রীয় সৈকতি অনুষদন ও প্রশিক্ষণ পরিষদ, অসম গুয়াহাতি। From the content of arithmetic book ‘Unit 3’ ‘Deyua O Nayua (দেযুা ও নয়ুা)’, Page 29-45 (২৯৬৯৬৫৪৫) was selected. The investigator began with simple mathematical problems and later to complex problems. Through computer the investigator showed the pictures of addition and substraction and accordingly the children were taught.

The investigator used Edward Thorndike’s law of effect for teaching the students, right responses were repeated while wrong responses were avoided. Bauch (1968) study found that parents of handicapped children mostly rely on trial and error strategies. The investigator used these strategies as she thought it would be suitable for these class-III children. This period is regarded as foundation period, as the child learns it forever which is taught during this period. National Institute of Health study revealed that sixty-seven percent of young children who were at-risk for reading difficulties became average or above average readers after receiving help in early
grades (Jake Lawson, 2011). Stunburg (1999) viewed that early remediation can greatly reduce the number of children meeting diagnostic creature for learning disability.

At the end of every week a test was conducted by investigator for experimental group especially to see whether they have learnt or not. After each week the questions were made harder this tests score were not taken for analysis.

3.6.3 Third phase-[Final test]

The Questionnaire for Specific Learning Disabled children was given at the end of the fourth week to both the groups (experimental and control).

This test was mainly used to observe whether the teaching with special strategies had any effect on experimental group or not. The result of the test gives the finding of the study for which the experiment was conducted.

Content based books are been given. (English Book appendix 5, Mathematics Book appendix 6)

3.7 Statistical analysis:

The Questionnaire for Specific Learning Disabled Children was used by the investigator both in collecting pre-test score and post-test score, it helped to measure the difference before and after the strategy was applied.

The investigator used Spearman rank difference, Split-half method, Percentage, Mean, SD, t-test and ANOVA(Wyner, 1971)