CHAPTER 5
FINDINGS AND SUGGESTIONS

5.1 INTRODUCTION

This chapter gives a brief summary of the research findings based on conceptual framework and hypothesis, and suggestions for future research topics.

Specific Learning Disorder (SLD) is a neurodevelopmental disorder of biological origin manifested in learning difficulty and problems in acquiring academic skills markedly below age level and manifested in the early school years, lasting for at least 6 months; not attributed to intellectual disabilities, developmental disorders, or neurological or motor disorders. The types of SLD are impairment in reading (Dyslexia), impairment in written expression (Dysgraphia), and impairment in mathematics (Dyscalculia). The condition varies in its manifestations and in degree of severity—mild, moderate or severe.

The review of related literature reveals various studies related to the children with SLD. This provided a better understanding of the research problem and helped the researcher to proceed with the study in a meaningful manner.

The main aim of the study was to identify children with SLD in CBSE inclusive schools and to plan and implement intervention strategies for them. The objectives of the study were to study the socio-demographic characteristics of children with SLD and their performance in academic readiness and academic skills before intervention and after intervention. This aim of the study was to study the socio-demographic details of the primary school teachers and the parents of children with SLD. This study also aimed to understand the awareness of SLD among the primary school teachers before and after the training program and to create awareness about SLD among the parents of children with SLD.

The researcher adopted a quasi-experimental research design with a single group pre and post-test design (Ranjith Kumar, 2005). Multi-stage sampling technique was used to select the sample. The details of the results were tabulated and presented.
5.2 FINDINGS RELATED TO CONCEPTUAL FRAMEWORK

Early Identification and Intervention of Children with SLD

CHILDREN
Children II to V Grade with SLD

TEACHERS
Primary school teachers who teach English, Language, Math & Science

PARENTS
Parents of children with SLD

PHASE I
School screening & Pre-intervention assessment

Academic Readiness skills
- Visual Discrimination
- Visual Memory
- Auditory Discrimination
- Auditory Memory
- Speech & Language
- Visual Motor & basic writing skills
- Attention

Academic skills
- Reading
- Reading Comprehension
- Listening Comprehension
- Spelling
- Writing
- Arithmetic

Pre-training assessment on awareness of SLD

Awareness of:
- General view of Specific Learning Disabilities (SLD)
- Characteristics of SLD
- Early identification and intervention of SLD
- Awareness of CBSE board provisions for students with SLD
- Classroom accommodations & techniques to handle children with SLD

Parent-Teacher Meeting & Awareness Program

Orientation on
- Aspects of learning
- Importance of Early Intervention
- Intervention for children with SLD
- Multisensory approach of learning
- Suggestions for Parents

PHASE II

Intervention through Individualized Education Program (IEP)

Training program for the teachers

Training & Awareness Creation by developing a Manual on "Early Identification and Intervention of Children with SLD"

Intervention Program for the children

Awareness Program for the parents

PHASE III

Post-intervention assessment

Post-training assessment

Follow up Recommendations
PHASE I

CHILDREN

5 English medium CBSE schools were selected in Trichy district, Tamil Nadu. Children between 7 and 11 years and studying II to V grade were initially identified on the basis of poor scholastic performance as reported by their teachers. 92 children out of 848 were found to be below average in their academic performance. Of them, 47 children were chosen after obtaining parents’ consent. These children were screened for sensory impairment and other disabilities and further screened using Brigance Diagnostic Assessment (Albert H. Brigance, 1977) to understand their basic skills. These children were assessed for IQ using Binet Kamat Test of Intelligence (Kamat, 1967) with the help of a recognized Rehabilitation Psychologist. Among them, 43 children had average or above average IQ, then they were further assessed for SLD using NIMHANS index (John and Kapur et al, 1989/1991/2011). The other 4 children were referred for necessary support.

TEACHERS

30 primary class teachers (handling these children who have been chosen for the study) teaching English, Mathematics, Science and Language (Tamil & Hindi) were recommended by the respective principal of the chosen schools, were taken for the training.

PARENTS

Initially parents of 92 children (between 7 and 11 years and studying grade II to V) with poor scholastic performance were invited to come for a parent-teachers meeting at school. They were oriented on why children perform poor in academics, its possible reasons and the way forward. Of them, 47 parents (father or mother or both) gave a consent form to include their children in this study believing that they would be benefitted from the intervention program. Among them, 43 children were found to suffer from SLD therefore only their parents were contacted further for awareness program and sessions.
PHASE II
CHILDREN

On the basis of pre-assessment scores of the chosen children, intervention program was planned. Individualized Education Plan (IEP) (sample appended) was developed for each child and the targets that were set for intervention was to improve (1) Academic readiness skills such as Visual discrimination, Visual memory, Auditory discrimination, Auditory memory, Speech & language, Visual motor & basic writing skills and Attention (2) Academic Skills such as reading skills, reading and listening comprehension, writing and spelling and arithmetic skills.

Though individual characteristic of each child was taken into consideration, intervention was mainly focused in group settings, where all the children were divided into groups-Grade II & III and IV & V. Group Intervention Plan was used for these groups to record the learning targets and strategies. The close relation and effective communication among children in the intervention sessions were effectively maintained. They felt more comfortable with their peer group and felt free to give feedbacks and positive reinforcements among themselves like clapping hands, hand shaking and social praising based on their work done, so their motivational level was found to be high.

The intervention was developed as games and exercises to increase their interest and motivation to learn academic readiness and academic skills. Words, sentences, phrases and passages were presented to the children in the form of pictures, flash cards, visual charts, story books and worksheets. The researcher used available school resources, ICT (Information & Communication Technology) materials and also prepared low cost teaching materials. Therapy balls, highlighters, crayons, colour papers, rattles, play links, pencil and pens, books, sand, rice, play cards, maze, abacus, and puzzles were used as teaching learning materials. Information and Communication Technology was used such as Power Points, Smart board, Audio-Visual materials, computers and online games. Timer was used to encourage the children to finish the given task on time.
The intervention program was planned and carried out for 140 sessions in 5 schools using various teaching strategies for academic readiness and academic skills. Each session was for 45 minutes with 3-5 sessions per week. The groups were taken out for intervention sessions after school hours and during school periods (English, Art, Library, Yoga and Music). Children who required one to one support were called during school hours to work on specific academic skills and behavior expectations. They were counselled and monitored timely.

The multi-sensory strategies included Phonics-letter sounds (Orton Gillingham & Stillman, 1968), Neurological Impress Method (Heckelman, R.G, 1969) for reading, sight words (Fernald Method, 1943), Consonant-Vowel-Consonant words (Linguistic Approach, Bloomfield & Barnhart, 1942/1961), decoding, syllabification & spelling rules, Cloze procedure for passage comprehension (Bormuth, 1968), every day writing practice (Language based teaching, Newhall, P. W. 2012), math online games and card games for arithmetic skills. Their reading and writing errors were noted down and corrected. Each group was given stars (reward) for their co-operation; they were motivated through social and material reinforcements. Throughout the intervention sessions, they were given feedback on the groups’ performance at the end of the session to correct their mistakes.

Monthly tests were conducted to review the children’s performance and to monitor their progress. The outcome of the test was recorded in the Monthly Review Plan (Sample appended) of their IEP. Each student’s Monthly Review Plan was reviewed and the strategies and/or materials were modified as per the needs of the children to ensure their progress.

TEACHERS

The training program for 4 days of 6 hours each day was conducted for the primary school teachers on “Early identification and Intervention of Children with SLD in the general classroom”. Feedbacks received from the teachers. The teachers observed the intervention sessions that was given to the children with SLD. They were empowered to implement the intervention strategies for children with SLD.
PARENTS

An awareness program was conducted for the parents of children with SLD to make them understand their children’s difficulties and to encourage them to co-operate and participate in their children’s learning. The parents were counselled class wise, and for some parents individually, where they were given practical suggestions to follow at home to support their child.

PHASE III

CHILDREN

During post-intervention, children’s performance was again scored and compared with the pre intervention scores to find out the improvement noticed in all the dimensions of academic readiness and academic skills. The result of the post intervention showed that their overall academic performances have improved significantly. The overall reading errors (Table No. 4A) and writing errors (Table No. 4B) were found to have reduced after intervention.

TEACHERS

The level of awareness of SLD among the primary school teachers was evaluated before and after the training program. They were empowered to implement the intervention strategies for children with SLD. Teachers reported that the children’s improvements were visible in the class room. They took interest to read, clarifying their doubts, involved in group work and completed their class works. Though they had difficulties in certain areas of learning, they did not hesitate in trying their best. In addition to learning, the teachers also noticed improvement in children with SLD with regard to their behavior, organizing skills and social interaction with their peers and they were more self-confident.

PARENTS

Parents took active part in the awareness program. Almost all the parents were aware of their child’s difficulties. So far the parents were completing their child’s home works and incomplete class works. They were encouraged to share their expectations and their child’s actual performance. They wanted their children to perform fairly well in tests, beside test performance they expected their child should know to answer
general questions when asked, read the books, complete class works, recall and able to describe what they had learnt in school, and basic calculations. They stated that since they did not know how to bring up their child’s academic performance they sent him/her to extra tuitions in the evening and also to other extra-curricular classes. They wanted some support from the school so they gave consent to include their children in the intervention program. They learnt various techniques on handling their children with SLD. They carried out the reinforcement techniques at home to appreciate the child’s effort which in turn motivated them to perform better. The parents started to encourage their children to complete his/her assigned tasks and home works by himself/herself. With the help of peers, the child was able to complete the class works in the classroom which was very helpful for the parents to get to know what was taught in the class. They were also started spending time with the child asking about the day at school. Their motivation and optimal participation has also contributed towards the improvement in their child’s academic skills. Suggestions were given to teachers and parents for further follow up of the children with SLD. Feedback about the intervention and awareness program that was received from the parents was highly positive.

MANUAL

A manual on “Early Identification and Intervention of Children with SLD” describes about general view of SLD, its characteristics, importance of early identification, intervention strategies (Academic Readiness skills & Academic skills), classroom accommodations & techniques to handle children with SLD. The intervention strategies suggested in the manual would be helpful for the teachers and parents to support children with SLD.

5.3 FINDINGS RELATED TO SOCIO-DEMOGRAPHIC CHARACTERISTICS OF CHILDREN

- 33% of children with SLD were in the age group of 8 years. (Table No. 1)
- The highest numbers of children with SLD (15) were in Grade III. More than half of children with SLD (56%) were boys. (Table No. 1)
- Majority of the children (81%) had mother tongue as Tamil and were from urban families. (Table No. No. 1)
• The highest percent of student respondents (26%) were found to be in CBSE School 2. (Figure 1A)

• 42% of children had predominantly reading difficulty which is the most common learning disability, it is otherwise known as dyslexia. 35% of children had writing difficulty and 23% had difficulty in Math. (Figure 1B)

• Majority of children (81%) with SLD were right handed and 19% of them were left handed. (Figure 1C)

• When observed for any associated problems in children with SLD, 28% of them had inattention and low self-concept and 23% had poor social skills where they find hard to adjust with their fellow students, breaking the class rules, and disturbing other children in the classroom. (Figure 1D)

• Majority (81%) of children attended 121-140 sessions. This could be because of their parents, they motivated their children to attend the sessions without fail. (Figure 1E)

TEACHERS

• 53% of teachers were in age group 21 to 30 years where as 10% from 41 to 50 years

• Majority (70%) of the teachers had Bachelor of Education (B. Ed) qualification while 30% of teachers had completed Master of Education (M. Ed).

• Half of the teachers taught English whereas 17% of them Math and Science teachers

• 50% of teachers had teaching experience between 6 and 15 years, while only 10% of teachers had more than 15 years of teaching experience.

PARENTS

• Majority of fathers and mothers (70% and 65%) completed higher education while 19% and 21% of fathers and mothers had studied only up to school level education.
• 56% of fathers and 14% of mothers were doing business and 44% of fathers and 47% of mothers were professional. 40% of mothers were home maker.

• 35% of parents earned an annual income between 5 and 10 lakhs and 16% earned above 15 lakhs annually.

• 47% of the children with SLD were first born to the parents.

• 30% of them were selected their partners from their second or third degree relatives and the rest were non consanguineous unions.

• Majority of parents (81%) were from nuclear families and 19% parents were belong to joint families.

• Majority of parents (74%) did not have any family history of disability while 26% had a family history of disability.

• All the parents (100%) reported to be understanding of their child’s strengths.

• Majority of parents (93%) were aware of their child’s learning concerns and agreed to motivate them and to participate in their child’s school activities, whereas 7% of parents were not ready to accept that their children had any difficulties but believed to be lazy and playful.

5.4 FINDINGS RELATED TO CHILDREN BEFORE INTERVENTION AND AFTER INTERVENTION

➢ There is a significant difference between before intervention and after intervention with regard to
• all the dimensions of Academic Readiness Skills. (Table No. 2)
• all the dimensions of Academic Skills. (Table No. 3)

SOCIO-DEMOGRAPHIC VARIABLES OF CHILDREN

➢ There is a significant difference between before intervention and after intervention (Table No. 8A) with regard to
• grade of study and visual discrimination and speech & language of Academic Readiness Skills
There is **no significant difference** between before intervention and after intervention with regard to

- gender and all the dimensions of *Academic Readiness Skills*. (Table No. 5A)
- gender and all the dimensions of *Academic Skills*. (Table No. 5B)
- mother tongue and all the dimensions of *Academic Readiness Skills*. (Table No. 6A)
- mother tongue and all the dimensions of *Academic Skills*. (Table No. 6B)
- place of residence and other dimensions of *Academic Readiness Skills* except auditory discrimination. (Table No. 7A)
- place of residence and all the dimensions of *Academic Skills*. (Table No. 7B)
- grade of study and visual memory, auditory discrimination, auditory memory, visual motor & basic writing skills and attention of *Academic Readiness Skills*. (Table No. 8A)

There is a **significant association** between the dimensions of *Academic Skills* with regard to

- grade of study and reading and writing before intervention and after intervention. (Table No. 8B)
- grade of study and reading comprehension, spelling and arithmetic after intervention. (Table No. 8B)

There is **no significant association** between the dimensions of *Academic Skills* with regard to

- grade of study and listening comprehension before intervention and after intervention. (Table No. 8B)

There is a **significant relationship** between before intervention and after intervention with regard to

- age and all the dimensions of *Academic Readiness Skills*. (Table No. 9A)
THE DIMENSIONS OF ACADEMIC READINESS SKILLS

A significant positive relationship is seen between the dimensions of Academic Readiness Skills (Table No. 10A) with regard to:

- visual discrimination and visual memory, visual motor & basic writing skills before intervention and after intervention
- visual discrimination and attention after intervention
- visual memory and visual motor & basic writing skills before and after intervention
- visual memory and attention after intervention
- auditory discrimination and auditory memory, speech and language & attention before intervention and after intervention
- auditory memory and speech & language after intervention
- auditory memory and attention before intervention and after intervention
- speech & language and attention after intervention
- visual motor & basic writing skills and attention before and after intervention

A significant negative relationship is seen between the dimensions of Academic Readiness Skills (Table No. 10A) with regard to:

- visual discrimination and auditory memory after intervention
- visual memory and auditory discrimination after intervention

There is no significant relationship between the dimensions of Academic Readiness Skills before intervention and after intervention (Table No. 10A) with regard to:

- Visual discrimination and auditory discrimination & speech and language
- Visual memory and auditory memory & speech and language
- Auditory discrimination and visual motor & basic writing skills
- Auditory memory and visual motor & basic writing skills
- Speech & language and visual motor & basic writing skills
THE DIMENSIONS OF ACADEMIC SKILLS

A **significant positive relationship** is seen between the dimensions of *Academic Skills* (Table No. 10B) with regard to

- reading skill and reading comprehension, listening comprehension, writing, spelling & arithmetic skills before intervention and after intervention
- reading comprehension and listening comprehension, writing, spelling & arithmetic skills before and after intervention
- listening comprehension and writing, spelling & arithmetic skills before and after intervention
- writing skill and spelling & arithmetic skills before and after intervention

There is **no significant relationship** between the dimensions of *Academic Skills* before intervention and after intervention (Table No. 10B) with regard to

- spelling and arithmetic skills

THE DIMENSIONS OF ACADEMIC READINESS AND ACADEMIC SKILLS

There is a **significant positive relationship** between *Academic Readiness Skills* and *Academic skills* before and after intervention (Table No. 11) with regard to

- visual discrimination and reading, reading comprehension, listening comprehension & spelling skills after intervention
- visual discrimination and arithmetic skills before intervention and after intervention
- visual memory and reading, spelling and arithmetic skills after intervention
- auditory discrimination and listening comprehension & spelling skills before intervention and after intervention
- auditory discrimination and writing & arithmetic skills after intervention
- auditory memory and listening comprehension, writing & arithmetic skills after intervention
• auditory memory and spelling skills before intervention and after intervention
• speech and language and reading, listening comprehension & writing after intervention
• speech and language and reading comprehension & spelling skills before and after intervention
• visual motor & basic writing skills and writing, spelling and arithmetic skills after intervention
• attention and reading, reading comprehension, writing, spelling and arithmetic skills after intervention
• attention and listening comprehension before intervention and after intervention

➢ There is no significant relationship between Academic Readiness Skills and Academic skills before and after intervention (Table No. 11) with regard to
  • visual memory and reading comprehension, listening comprehension & writing
  • auditory discrimination and reading & reading comprehension
  • auditory memory and reading & reading comprehension
  • speech and language and arithmetic skills
  • visual motor & basic writing skills and reading, reading comprehension and listening comprehension

5.5 FINDINGS RELATED TO TEACHERS BEFORE TRAINING AND AFTER TRAINING
➢ There is a significant difference between before training and after training (Table No. 13) with regard to awareness of
  • General view of Specific Learning Disabilities (Figure 13A)
  • Characteristics of SLD (Figure 13B)
  • Early identification and intervention of SLD (Figure 13C)
  • Awareness of CBSE board provisions for students with SLD (Figure 13D)
Classroom accommodations & techniques to handle children with SLD (Figure 13E)

5.6 FINDINGS RELATED TO HYPOTHESIS

CHILDREN

Hypothesis 1:

There is no significant difference with regard to the dimensions of Academic Readiness skills before intervention and after intervention in children with SLD.

The paired ‘t’ test was applied and a significant difference was found in Academic Readiness skills before intervention and after intervention. After intervention, the children with SLD seemed to have improved in all the dimensions of Academic Readiness skills.

Hence the null hypothesis is rejected. (Table No. 2)

Hypothesis 2:

There is a significant difference with regard to the dimensions of Academic skills before intervention and after intervention in children with SLD.

The paired ‘t’ test was applied and a significant difference was found in Academic skills before intervention and after intervention. After intervention, the children with SLD seemed to have improved in all the dimensions of Academic skills.

Hence the null hypothesis is rejected. (Table No. 3)

Hypothesis 3:

There is no significant relationship between Visual Discrimination and Visual motor & basic writing skills after intervention.

Karl Pearson’s co-efficient of correlation was applied and a significant positive correlation was found between Visual Discrimination and Visual motor & basic writing skills after intervention. Better Visual Discrimination increases Visual motor & basic writing skills after intervention.

Hence the null hypothesis is rejected. (Table No. 10A)
Hypothesis 4:
There is no significant relationship between Auditory Discrimination and Speech & Language after intervention.

Karl Pearson’s co-efficient of correlation was applied and a significant positive correlation was found between Auditory Discrimination and Speech & Language after intervention. Children who develop good Auditory Discrimination develop good Speech & Language after intervention.

Hence the null hypothesis is rejected. (Table No. 10A)

Hypothesis 5:
There is no significant relationship between Reading and other dimensions of Academic skills after intervention.

Karl Pearson’s co-efficient of correlation was applied and a significant positive correlation was found between Reading and other dimensions of Academic skills after intervention. Children with SLD who have good Reading skills fare better in the other dimensions of Academic skills after intervention.

Hence the null hypothesis is rejected. (Table No. 10B)

Hypothesis 6:
There is no significant relationship between Writing and Arithmetic skills after intervention.

Karl Pearson’s co-efficient of correlation was applied and a significant positive correlation found between Writing and Arithmetic skills after intervention. Better Writing skills increases Arithmetic skills after intervention.

Hence the null hypothesis is rejected. (Table No. 10B)

Hypothesis 7:
There is no significant relationship between Visual Memory and Listening Comprehension after intervention.
Karl Pearson’s co-efficient of correlation was applied and no significant correlation found between Visual Memory and Listening Comprehension after intervention.

Hence the null hypothesis is accepted. (Table No. 11)

**Hypothesis 8:**

There is no significant relationship between Auditory Memory and Reading Comprehension after intervention.

Karl Pearson’s co-efficient of correlation was applied and no significant correlation found between Auditory Memory and Reading Comprehension after intervention.

Hence the null hypothesis is accepted. (Table No. 11)

**Hypothesis 9:**

There is no significant relationship between Attention and all the dimensions of Academic skills after intervention.

Karl Pearson’s co-efficient of correlation was applied and a significant positive correlation was found between Attention and all dimensions of Academic skills after intervention. Children with SLD who have good Attention fare better in all the dimensions of Academic skills after intervention.

Hence the null hypothesis is rejected. (Table No. 11)

**TEACHERS**

**Hypothesis 10:**

There is no significant difference with regard to the awareness of SLD among teachers before training and after training.

The paired ‘t’ test was applied and a significant difference found with regard to the awareness of SLD among teachers before training and after training.

Hence the null hypothesis is rejected. (Table No. 13)
5.7 SCHOOL BASED INTERVENTION

- The teachers and school administrators can refer at risk SLD students for proper diagnosis.
- On-job training can be given to all teachers on ‘Teaching strategies and classroom accommodations’ for students with SLD at a regular interval.
- Special Educators can be appointed in inclusive schools to assist the teachers in identifying and teaching children with SLD.
- Individual and small group interventions will be helpful to improve the academic skills of children with SLD.
- Parents support group can be organized where the parents of children with SLD share and learn the coping strategies.

5.8 SUGGESTIONS FOR FUTURE RESEARCH

The researcher has suggested few research topics related to the study.

- The present study was based on a sample of 43 children from CBSE schools in Trichy district. This study should be replicated in other region of Tamil Nadu. Hence, only through a series of such research, generalization about the actual prevalence of children with SLD in India could be found.
- Develop an assessment tool for children with SLD in Tamil (regional language of Tamil Nadu, India).
- Identification and Intervention of children with SLD in Tamil Nadu State Board Schools, High schools and Universities can also be studied.
- A comparative study on various intervention strategies for children with SLD in urban and rural areas.
- Impact of English as a Second Language among the children with SLD.
- Role of Teachers and Parents in the intervention program for children with SLD.
- Role of Central Government of India and State Government of Tamil Nadu in providing services to children with SLD.
5.9 SUMMARY

At the end of the structured intervention program, children’s performance was found to have improved significantly in all dimensions of academic skills. Children with SLD were confident as they could read their text books by themselves using strategies they had learned in the intervention program.

The training program also proved to be successful. Teaching strategies and classroom accommodations and modifications were also recommended to the primary teachers to support children with SLD. Teachers who were a part of this study stated that this intervention program brought scholastic improvements in the students’ school examination scores with regard to the core subjects they taught.

The awareness program made the parents understand their children’s learning difficulties. Parents learnt to appreciate their children's effort in learning and maintain some flexibility in their expectations regarding their children's academic achievement. Parents were counselled on simple methods of intervention with the help of the manual. They were recommended to help their children in their learning at home and were referred to other intervention centers for further support.

The research findings has enabled the researcher to develop a manual on “Early Identification and Intervention of Children with SLD” to enable school teachers and parents understand the nature of SLD better. This ready reckoner describes the characteristics of children with SLD, their specific learning needs, and suggests identification criteria and some intervention and teaching strategies to be followed by the regular teachers at school.

5.10 CONCLUSION

This study has found that the early intervention program for primary class SLD children was effective and brought positive results in the academic lives of children with SLD. Because, it helped them to catch up with their peers. It also served as a preventative measure against their learning gaps. Early Identification and Intervention will also reduce their socio-emotional problems linked with their academic failures which in turn will improve their self-confidence and self-image. Hence, Early Identification and Intervention during primary class, is vital for minimizing the degree
of difficulties. It gives the child a chance to lead a successful and productive life.

“The Early Identification and Intervention of Children with SLD” manual with practical
teaching techniques serves as a ready reckoner to facilitate teachers and parents in
handling children with SLD. So it’s sure, that the intervention strategies used in this
study can be applied for teaching children with SLD by teachers effectively in the
inclusive classroom.