CHAPTER 6
SUMMARY AND CONCLUSIONS

6.1 Conclusions
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The present study was focused on children with Learning Difficulties. These children are diagnosed with LDL and LDN by medical professionals. The behavioral problems such as ADD and ADHD and few emotional problems were studied with the children. To find out the emotional problems of these children Emotional Rating Scale (ERS) was developed. Their Intellectual potential was measured on MISIC, to see the differences between their intellectual abilities.

**What is a Learning Difficulty?**
Learning Difficulty is a term used to describe a specific group of children and adolescents who have problems in learning. Difficulties in learning are found across all ages and in all socio-economic classes. This is not a type of Mental Retardation as mistaken by many people.

These problems are generally school related, in the areas of reading, writing, spellings and mathematics. Parents and teachers usually discover the problem when children fail to cope up with schoolwork, generally at 2nd to 5th standard levels. These children are bright, fairly articulate in their verbal expression and do not appear to have any form of Mental Retardation. They can see, hear and do not have marked intellectual deficits but show deviation in behavioral and psychological development to such an extent that they are unable to adjust at home or to learn by the ordinary methods used in the school.

**Manifestations of Learning Difficulty**
Learning Difficulty is manifested in various forms- reversals of letters (e.g. b/d, p/q etc.), omission of letters, use of limited vocabulary, and reversals of numbers (e.g. 36/63 etc), having difficulty in phonetically building the spellings, problems in solving word puzzles, and difficulties in simple mathematical functions like addition, subtraction, division and multiplication.

There are many different types of Learning Difficulties and there is a great deal of variation within individuals. Symptoms and behaviors vary a great deal, further confusing the issue. A
child may be excellent in mathematics and perform poorly in reading and writing. Another child may find it very difficult to write sentences in English but may have good verbal skills. Even within a subject area, there may be a great deal of variation. A child may have problems in expressing thoughts in writing and another child may be unable to associate sounds and symbols—both having problems in written expressions.

Related Research
The focus of the research in LD has been on finding the causes, characteristics, subtypes and recently on remediation. More and more studies on the neurological aspects of LD are undertaken and cited and also about the differences in hemispheric anatomy, functions, the genetic basis of LD, subtypes of LD, and so on. Emotional and behavioral problems especially ADHD and ADD were also studied by many researchers in the field of LD.

Research by various researchers on subtypes of LD is going on for last 25-30 years. Each one has categorized LD in various ways and each has given different names for subtypes. For example, disorders of reading have been universally accepted as Dyslexia, mathematical disorders as Dyscalculia and disorder of written expression as Dysgraphia. Within each of these major types, especially dyslexia and dyscalculia, researchers are trying to subcategorize and name the subtypes. In doing so, more confusion is created instead of unanimity.

Examples can be cited of research by Rourk et al. They have categorized LD into Group RS (reading and spelling disorders) and Group A (disorders in mathematics.) Lauria divided LD into type I, Type II, Type III and type IV; whereas Kosc classified dyscalculia into six categories-verbal, practognistic, lexical, graphical, ideognostical and operational. A recent trend of thought also says that subtyping is as difficult as defining LD (Nakra, 2001).

Various intelligence tests are used for assessment and identification of LD. WISC-III is the most widely and commonly used test along with other tests like WISC-R, Woodcock-Johnson's tests, Peabody Individual Achievement Test, Wide Range Achievement Test, etc. to name a few.
Many studies were already undertaken on emotional and social problems of children and adolescents with learning difficulties, psychological co-morbidity in children and adolescents with LD (Johnson, B., 2000, 2005; Bender, W. & Wall, 1994; Handwerk, Michael, Marshall, Richard, 1998).

Majority of the studies related to LD showed the correlation between LD and Attention Deficit Hyperactivity Disorder (ADHD) (Mays, Susan, Calhoun, Susan, Crowell, 2000; Maynard, Tyler & Arnold, 1999).

A review of literature in the area of intellectual abilities and LD mainly focused on IQ assessment of LD children using different intelligence scales, discrepancy between IQ and achievement, comparison and analysis of various intelligence scales with LD and non-LD children. The common Intelligence test used for the assessment was Wechsler Intelligence Scale for children (WISC) (D’Angiulli, Amedeo, Linda, 2003). Diagnosis of LD, especially in India, by using various intelligence scales in different languages is the least studied area and it needs special attention.

This Study
In the present study, the significance of positive correlation is being investigated between intellectual abilities of LDL and LDN on MISIC, and ADHD and emotional problems in three different age groups. In age group 1, children were diagnosed with LDL and LDN between 6 to 7 yrs. In age group 2, children were diagnosed with LDL and LDN between 8 to 9 yrs. and in age group 3, children were diagnosed with LDL and LDN between 10 to 11 yrs. of age. Co-occurrence of behavioral problem namely ADHD and ADD and emotional problems are also investigated in the present study.

Performance given by children with LDL and LDN, and use of MISIC in diagnosis of LD is another area of interest which is explored in this study.
The study obtained very unique results for the children with LD in all three participated age groups. They found to be having the co-occurrence of ADHD and emotional problems.

This study has demonstrated that, when Pearson Product Moment Correlation is calculated, between ADHD and intellectual abilities of LDL and LDN, in three age groups, there is no significant positive correlation between behavioral problems namely, ADHD, ADD and intellectual abilities of LDL and LDN in three age groups.

No significant correlation is found between emotional problems and intellectual abilities of LDL and LDN in three age groups of the study. Intellectual ability of children is not affected in relation to their LD, ADHD and emotional problems. These children are found to be Average in intellectual ability measured on MISIC.

This study has also sought to explore the diagnostic utility of MISIC, to identify children with LD separately as LDL and LDN. Results from the comparison of means between the age groups and types of LD from Two Way ANOVA revealed that, MISIC can be used successfully to differentiate the two LD groups, namely LDL and LDN from each other. Also intellectual abilities of children in three age groups, 6 to 7 yrs, 8 to 9 yrs. and 10 to 11 yrs., differed significantly from each other. Overall Mean FSIQ denoted Average intellectual functioning of children with LDL and LDN.

When t test analysis were applied for each sub test Means for MISIC, LDL and LDN in three age groups, the results indicated that the children with LDL and LDN differed significantly on Arithmetic sub test in all age groups. This may be because children in LDN group already had weak mathematical ability. Their mean scores in all three age groups were comparatively lower than children with LDL.

6.1 Conclusions
By and large the results of this study indicate that, the significant difference of performance on the verbal IQ, performance IQ and FSIQ suggests that LDN groups function at a lower level than the LDL group. The results suggest that, the LDN group lacks abilities measured by verbal and performance sub tests to a greater extent than the LDL group. It is the experience and the observation of the researcher that, children with LDN perform poorly than LDL in school setting. Thus, this result is also reflected in their academic performance where their numerical difficulty along with difficulties in other abilities leads to poorer academic problems. These academic problems lead to the development of emotional and behavioral problems. Emotional and behavioral problem analysis in LDL and LDN shows that group LDN showed elevated score on behavioral and emotional problems than LDL group.

These results will alert clinical practitioners for proper screening, diagnosis, ability mapping and counseling of referred children for LD diagnosis by means of administration of various psychological tests. LD diagnosis should incorporate ADHD and emotional problems screening, along with intelligence testing. The use of MISC is significantly high in deciding the type of LD. Once we get the results form all these assessments, remediation and counseling of a child can be done systematically. Along with different academic needs of LD children which fulfilled through Individualized Educational Plan (IEP), their emotional and behavioral problems should also be taken seriously. Help should be provided for each child to overcome the behavioral and emotional problems.

In a nutshell, the conclusions are:

1) There is no significant correlation between ADHD and intellectual abilities of LDL in three age groups.

2) There is no significant correlation between ADHD and intellectual abilities of LDN in three age groups.

3) There is no significant correlation between emotional problems and intellectual abilities of LDL in three age groups.

4) There is no significant correlation between emotional problems and intellectual abilities of LDN in three age groups.
5) Though significant correlations could not be found between intellectual ability and ADHD of LDL and LDN, the co-occurrence of ADHD and an emotional problem, which encompasses Anxiety, low self-esteem, guilt, dysphoric or sad mood are predominant and consistent in all age groups and in the two types of LD that is LDL and LDN.

6) Emotional problems are found to be associated with the LD. On the ERS scale problems rated by LDL and LDN children indicate Moderate emotional disturbance. Children with LDN had rated higher on ERS than children with LDL.

7) Children with LDN were also comparatively higher than LDL on ADHD and on ERs. Age groups differ significantly on emotional problems, but ADHD symptoms are found to be more or less same for three age groups.

8) There is significant difference between the intellectual abilities of LDL and LDN in three age groups and types of LD.

9) Children with LDN are found to be inferior to LDL on IQ scores. The group LDN was inferior to group LDL in accessing resources like mathematical reasoning, encoding, retrieval, memory, foresight and speed, eye-motor coordination. The differences between the two LD groups were statistically significant on Arithmetic, Digit Span, coding, Mazes and Block Design sub tests of MISIC.

10) When scores on MISIC test are studied in detail, one important observation was noted. When the scores of LDL and LDN are studied carefully for FDI analysis of MISIC, it is observed that both the groups score low on Arithmetic, Digit span and Coding sub tests of the MISIC.

12) Diagnostic utility of MISIC for identifying LDL and LDN groups is established.

6.2 Limitations of the Study

6.2.1 In this study the already diagnosed children with LDL and LDN were considered. Though these children were already identified as LD by professionals, they were identified by means of non-standardized, but reliable methods.

6.2.2 Emotional Rating Scale (ERS) does not have norms for normal population.

6.2.3 MISIC administration, for children with LD on few performance subtests, was difficult because of the timing factor.
6.3 Applications of the Study

6.3.1 In the present study, the co-morbidity of ADHD, ADD and emotional problems was seen in the children with LD. This finding may lead to careful evaluation and screening of these factors in children with LD.

6.3.2 MISIC can be used as a reliable tool for identifying LD in different types. Their weak and strong abilities from MISIC analysis will help remedial teachers to develop the weak abilities in the IEP.

6.3.3 Administration of first and second trial of ERS on children with any kind of LD in 6 to 11 yrs. of ages yielded a significant correlation between trials. This test can be used as a screening tool for assessing few emotional problems that may be associated with children diagnosed as LD.

6.3.4 These results can be applied in day to day clinical practice to evaluate the ADHD, ADD and emotional problems of the children with LD. ADHD and Emotional Rating scales proved to be convenient and reliable to administer. Both scales are easy to administer.

6.3.5 As a result, parents and teachers can be made aware of ADHD, ADD and emotional problems that might be associated with LD and proper screening for these problems will be possible. Their problems will not remain neglected.

6.4 Further Research

6.4.1 This study was administered on children with LD. Similar study can be possible with Normal children or non-LD groups.

6.4.2 Follow up studies with children with LD will be helpful in controlling their behavioral and emotional problems.

6.4.3 Similar studies may be replicated for other samples varying in SES, residential area, school instruction language.

6.4.4 Gender differences in similar attempts may be explored.