CHAPTER XII

SUMMARY AND CONCLUSIONS
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INTRODUCTION

Learning has often been defined as the process by which experience or practice results in a relatively permanent change in behavior or potential behavior. It is the acquisition and development of memories and behaviors, including skills, knowledge, understanding, values, and wisdom. It is the goal of education, and the product of experience. The Oxford dictionary (2001) gives three meanings of ‘learning’ (as a noun):

- The act, process, or experience of gaining knowledge or skill.
- Knowledge or skill gained through schooling or study.
- Behavioral modification especially through experience or conditioning.

In terms of physiology of learning, current understanding of neurons and the central nervous system implies that the process of learning corresponds to changes in the relationship between certain neurons in the brain. “Thought”, in a general sense, is commonly conceived as something arising from the stimulation of neurons in the brain. Generally, however, it is recognized that learning and thereafter the retention of memory comes easier when multiple parts of the brain (such as hearing, seeing, smelling, motor skills, touch sense, and logical thinking lobes) are stimulated. Therefore, it is the prime responsibility of the teacher to stimulate the senses of the students in order to be an effective teacher and to bring about effective learning among students.

Learning is a relatively enduring change in behavior which is a function of prior behavior (usually called practice) and excludes the changes due to illness, fatigue, maturation and use of drugs or intoxicants. It is not directly observable but manifests itself in the activities of the individual.

Learning plays very important role in determining the behavior of an individual. Almost all human behavior can be traced back to learning. The miracles of the present day civilization are the result of learning. That is why learning occupies the prime place in the field of education.
Children learn best when they are properly motivated for learning. There is no force equivalent to self-motivation and it has the capacity to surmount any obstacle. However, if students are not self-motivated, to begin with external motivation can prove to be equally rewarding. Only teacher is at the vantage point from where he/she may lead learning in any direction though the individual differences among students may hamper the teacher's progress in effective teaching.

No doubt that all children, except the very small minority with obvious functional defects, whatever their social, cultural and economic background, are born with precisely the same basic learning process for comprehending and predicting the world, just as all children tend to have the same complements of heads, arms and legs.

Despite this sameness in fundamental equipment, however, the diversity of human beings is enormous. All people seem to have different interests, different funds of knowledge, different skills, different attitudes and different motivations towards goals for different reasons. They learn different things at different times with different degrees of facility and different personal involvement in the different outcomes. They make sense of the world in characteristically individual ways.

Education plays a vital role in giving human beings proper equipment to lead a purposeful, gracious and harmonious life. In a normal and traditional classroom situation, all students are required to learn the same thing, at the same time, to the same extent and in the same way. Since learners differ from one another in ability, pacing, achievement, interests, learning styles, thinking styles, study habits, self-esteem, etc, their dependence on the same teacher seriously affects the academic progress of most of them.

Everyday teachers enter their classrooms with lesson plans, experience, expertise and the hope that what they are about to present to the class will be understood, remembered and will be useful to the students. The extent to which this hope is realized depends largely on the knowledge base that these teachers use in designing their lesson plans and, perhaps more importantly, on the instructional techniques they select while teaching, which have to be considered keeping in view the individual differences. Also, to a very considerable extent, learning depends on the experience and background of the learner. An understanding of these factors and the use of procedures based on this understanding make the teacher’s task easier.
It is believed that intelligence is a major factor influencing learning, but for some children with normal intelligence, learning is a struggle. In the words of Hammill (1990), these youngsters have a learning disability, which refers to a child who (a) has difficulty mastering an academic subject, (b) has normal intelligence, and (c) is not suffering from other conditions that could explain poor performance, such as sensory impairment or inadequate instruction.

Learning disability is much misunderstood and rarely detected, thereby leading to bare minimal corrective action. Each child with learning disability is different and unique – the result of a combination of factors, some of them being genetical and environmental influences or unsuccessful learning experiences. What goes undetected besides the disability is the underlying talent, creativity, curiosity, intuitive ability, visual and multi-dimensional thinking of the individual.

Today, teachers have an uphill task of taking along all the students despite the individual differences. Teachers try to change the human brain every day, day after day. If they know more about how it learns, they can be more successful in their endeavors. In the words of Moats & Lyon (1993), the key to helping these children is to move beyond the generic label “learning disability” to pinpoint specific cognitive and academic deficits that hamper an individual child’s performance in school. Then instruction can be specifically tailored to improve the child’s skills. Moreover, the children’s preferences and choices also play an important role not only in the inculcation of interest for learning but also in the improved outcomes.

The present study is an effort to provide the knowledge base to teachers. It was so planned and conducted as to get a more comprehensive understanding of the behavioral differentials of children suffering with learning disabilities and normal children. The researcher in the present study has concentrated on the styles of learning, styles of thinking, achievement motivation, self esteem and study habits as characteristic behavioural differentials. Academic achievement differentials have also been studied.

**STATEMENT OF THE PROBLEM**

“Characteristic behavioural differentials of learning disabled and normal children across levels of intelligence”.
OBJECTIVES OF THE STUDY

The study was planned and designed to achieve the following objectives:-

- To find out the incidence of 5th grade children having learning disabilities (LD).
- To study the characteristic behavioural differentials between learning disabled children (LD) and normal children (NC) across levels of intelligence.
- To study the characteristic behavioural differentials among learning disabled children (LD) across levels of intelligence.
- To study the characteristic behavioural differentials among learning disabled children (LD) at the same level of intelligence.
- To study the characteristic behavioural differentials among normal children (NC) across levels of intelligence.
- To study the characteristic behavioural differentials among normal children (NC) at the same level of intelligence.
- To study the gender differentials on behavioural characteristics of learning disabled children (LD) and normal children (NC).
- To study the academic achievement differentials of learning disabled children (LD) and normal children (NC).
- To study the correlates of intelligence, academic achievement, achievement motivation, styles of learning, styles of thinking, self-esteem and study habits.

DELIMITATIONS OF THE STUDY

The impracticability to exhaustively cover all the variables and related areas/components and in order to make the study specific, focused and time bound, the researcher had delimited the present study to:-

- Children studying in 5th class.
- Children studying in the Government Model Senior Secondary Schools of the U.T., Chandigarh.
- Achievement motivation (n-Ach), styles of learning (SL), styles of thinking (ST), self-esteem (SE), & study habits (SH) were the variables included under the characteristic behavioural differentials.
DESIGN OF THE STUDY

In the present study descriptive survey method was used in order to assess the behavioural characteristics of the learning disabled children and the normal children and thereby to study the differentials between these two groups. As mentioned earlier, five behavioural characteristics, viz. achievement motivation (n-Ach), styles of learning (SL), styles of thinking (ST), self-esteem (SE) and study habits (SH), were taken up for the investigation. In addition academic achievement (MARKS) differentials were also studied. To achieve the stated objectives children of 5th class having learning disabilities were identified and were categorized as average intelligent LD (LD_{AI}), above average intelligent LD (LD_{AAI}) and high intelligent LD (LD_{HI}). Matching normal children [matching of normal children (NC) with the LD children was done on the basis of intelligence, gender, class, & school] were also categorized as average intelligent NC (NC_{AI}), above average intelligent NC (NC_{AAI}) and high intelligent NC (NC_{HI}). The LD and NC groups were assessed on above mentioned behavioural characteristics using standardized tools and data on academic achievement was collected from school records. A comparison a between LD and NC groups was made to study the differentials. Figure 12.1 gives the figural representation of the design of the present study.

**Figure 12.1**

Design of the study

N = 196

LD = 98

LD_{AI} = 46

LD_{AAI} = 33

LD_{HI} = 19

NC = 98

NC_{AI} = 46

NC_{AAI} = 33

NC_{HI} = 19

Where

LD - learning disabled children, NC - normal children
AI - average intelligence, AAI - above average intelligence, HI - high intelligence
SAMPLE

For the purpose of sample collection, multistage randomized sampling technique combined with matching was applied.

At the initial stage, investigator prepared a sector-wise list of Government Model Senior Secondary Schools (English medium) of U.T., Chandigarh, out of which 8 schools were selected randomly by the lot of draws. After contacting the principals of the selected schools for the permission of data collection, the target schools for data collection were short listed to 6 schools.

Initial Sample: An initial sample of 725 children studying in fifth class was selected from randomly selected six Government Model Senior Secondary Schools of Chandigarh. All 725 children were administered Diagnostic Test of Learning Disability (DTLD) and Raven’s Standard Progressive Matrices (SPM).

Final Sample: Out of the initial sample of 725 children, learning disabled (LD) were identified (on the basis of DTLD) and categorized (on the basis of their intelligence scores given by SPM). The normal children (NC) were matched with the LD children on the basis of intelligence scores, gender, class and school. The final sample therefore comprised of 98 LD and 98 NC. Out of the 98 LD, 46 were in the average intelligence category (LD_{AI} = 46), 33 in the above average intelligence category (LD_{AAI} = 33) and 19 in the high intelligence category (LD_{HI} = 19). Similarly, out of 98 NC, 46 were in the average intelligence category (NC_{AI} = 46), 33 in the above average intelligence category (NC_{AAI} = 33) and 19 in the high intelligence category (NC_{HI} = 19).

HYPOTHESES

In accordance with the objectives of the present study following null hypotheses were framed:-

1: There would be no significant differences between learning disabled children (LD) and normal children (NC) on behavioural characteristics.

2: There would be no significant differences between average intelligent learning disabled children (LD_{AI}) and average intelligent normal children (NC_{AI}) on behavioural characteristics.
3: There would be no significant differences between above average intelligent learning disabled children ($LD_{AA}$) and above average intelligent normal children ($NC_{AA}$) on behavioural characteristics.

4: There would be no significant differences between high intelligent learning disabled children ($LD_{HI}$) and high intelligent normal children ($NC_{HI}$) on behavioural characteristics.

5: There would be no significant differences among learning disabled children (LD) on behavioural characteristics across the levels of intelligence.

5 (a): There would be no significant differences between average intelligent learning disabled children ($LD_{AI}$) and above average intelligent learning disabled children ($LD_{AA}$) on behavioural characteristics.

5 (b): There would be no significant differences between average intelligent learning disabled children ($LD_{AI}$) and high intelligent learning disabled children ($LD_{HI}$) on behavioural characteristics.

5 (c): There would be no significant differences between above average intelligent learning disabled children ($LD_{AA}$) and high intelligent learning disabled children ($LD_{HI}$) on behavioural characteristics.

6: There would be no significant differences among learning disabled children (LD) on behavioural characteristics at the same level of intelligence.

7: There would be no significant differences among normal children (NC) on behavioural characteristics across the levels of intelligence.

7 (a): There would be no significant differences between average intelligent normal children ($NC_{AI}$) and above average intelligent normal children ($NC_{AA}$) on behavioural characteristics.

7 (b): There would be no significant differences between average intelligent normal children ($NC_{AI}$) and high intelligent normal children ($NC_{HI}$) on behavioural characteristics.

7 (c): There would be no significant differences between above average intelligent normal children ($NC_{AA}$) and high intelligent normal children ($NC_{HI}$) on behavioural characteristics.

8: There would be no significant differences among normal children (NC) on behavioural characteristics at the same level of intelligence.
9: There would be no significant gender differentials on behavioural characteristics.

9 (a): There would be no significant gender differentials on behavioural characteristics between the entire sample of males (N=110) and the entire sample of females (N=86).

9 (b): There would be no significant gender differentials on behavioural characteristics between LD males (N=55) and LD females (N=43).

9 (c): There would be no significant gender differentials on behavioural characteristics between NC males (N=55) and NC females (N=43).

10: There would be no significant differences on academic achievement.

10 (a): There would be no significant differences on academic achievement between learning disabled children (LD) and normal children (NC) across the levels of intelligence.

10 (b): There would be no significant differences on academic achievement among learning disabled children (LD) and among normal children (NC) across the levels of intelligence.

10 (c): There would be no significant differences on academic achievement among learning disabled children (LD) and among normal children (NC) at the same level of intelligence.

10 (d): There would be no significant gender differentials on academic achievement.

11: There would be no significant relationship between intelligence, academic achievement, achievement motivation, styles of learning, styles of thinking, self-esteem and study habits.

TOOLS USED FOR DATA COLLECTION

For data collection following tools were used:-

- **Diagnostic Test of Learning Disability (DTLD)** by Swarup and Mehta (1993).
- **Standard Progressive Matrices (SPM)** by Raven, Raven and Court (2000).
- **Study Habit Inventory (SHI)** by Mukhopadhyay and Sansanwal (1983) – (adapted by the researcher).
- **Style of Learning and Thinking (SOLAT)** by Venkataraman (1994).
• Self-Esteem Inventories (SEI) by Coopersmith (1987).
• DEO-MOHAN Achievement Motivation Scale (n-Ach) by Deo and Mohan (1985).
• In addition, researcher conducted dictation in Hindi and English by taking a paragraph from the prescribed text books of the 5th class in order to identify and trace the symptoms associated with LD. Also, mathematical problems were given to identify the problems in basic computational skills.
• Information on academic achievement was obtained from the school records.

PROCEDURE OF DATA COLLECTION

The data for the present study was collected in phased manner, the details of which are as given below:-

Phase – I: The Principals of the randomly selected schools were personally contacted along with the written request for data collection. The purpose of the study for which data was to be collected, was explained to each of them. The Principals / Primary wing in-charges, after consulting the class teacher and the time-table of 5th class, permitted for data collection on particular dates, in particular periods.

Phase – II: As per the fixed dates and time data was collected from 5th class children by administering Diagnostic Test of Learning Disability (DTLD) and Raven’s Standard Progressive Matrices (SPM). Also, short dictation in Hindi and in English was taken. Six mathematical problems (2 subtraction problems, 2 multiplication problems, & 2 division problems) were given. In this phase data from 725 children was collected. Out of these children 98 LD children were identified and they were classified into three groups on the basis of their intelligence scores. Also, out of these 725 children, 98 normal children were matched with the 98 LD on the basis of intelligence score, gender, class & school.

Phase – III: After the annual examination, the principals were once again contacted to seek their permission for collecting information from the result records of the 5th class. The data on subject-wise marks as well as aggregate marks was obtained which provided information on the academic achievement of the 5th class learning disabled and normal children.

Phase – IV: Now that the children were in the 6th class, once again permission of the principal, in consultation with the class in-charge, was taken to
collect further data. In this last phase (which included two visits to each school) children were administered Style of Learning and Thinking (SOLAT) by Venkataraman (1994), Study Habit Inventory (SHI) by Mukhopadhyay and Sansanwal (1983), Self-Esteem Inventories (SEI) by Coopersmith (1987) and DEO-MOHAN Achievement Motivation Scale (n-Ach) by Deo and Mohan (1985).

STATISTICAL ANALYSIS
In the present study, the researcher has made use of descriptive as well as inferential analysis.

Descriptive analysis: The researcher has employed mean as a measure of central tendency, standard deviation as a measure of variability, correlation coefficient (Pearsons’ product moment ‘r’) as a measure of relationship, and frequency distribution diagrams to describe the characteristic properties of the sample.

Inferential analysis: Researcher has applied two-tailed t-test and chi-square ($X^2$) test to infer the results. Both the inferential statistics have been applied and discussed at 0.01 or 0.05 level of confidence.

FINDINGS
Incidence of LD
• In the present study, the researcher has found that the incidence of 5th class children having learning disabilities (LD) is approximately 13.52%.

Achievement Motivation
• The t-value is significant between the entire sample of males ($N_m=110$) and the entire sample of females ($N_f=86$) at 0.01 level of confidence and between NC males and NC females significant at 0.05 level of confidence
• The r values for n-Ach are significantly positive with MARKS, $SL_{1AB}$, $SL_{2AB}$, $SL_{3AB}$, $SL_{AB}$, $ST_{1AB}$, $ST_{2AB}$, $ST_{3AB}$, $ST_{AB}$, $SE_T$ & $SH_T$.

Styles of Learning
• The t-value is significant between NC and LD on $SL_{2B}$ at 0.05 level of confidence and between NC$_{1H}$ and LD$_{1H}$ on $SL_{1B}$ at 0.05 level of confidence and on $SL_{5A}$ at 0.01 level of confidence.
• The t-value is significant between LD$_{AA}$ and LD$_{HH}$ on $SL_{1B}$ at 0.05 level of confidence and on $SL_{5A}$ at 0.05 level of confidence.
• The t-value is significant between the entire sample of males (N_m=110) and the entire sample of females (N_f=86) on SL_{1AB} and SL_{3AB} at 0.05 level of confidence, on SL_{5A}, SL_{5B} and SL_{5AB} at 0.01 level of confidence, on SL_A at 0.05 level of confidence and on SL_{AB} at 0.01 level of confidence.

• The t-value is significant between LD males and LD females on SL_{4AB} and SL_{1AB} at 0.01 level of confidence, on SL_{3AB} and SL_{4AB} at 0.05 level of confidence, on SL_{5A} at 0.01 level of confidence, on SL_{5B} at 0.05 level of confidence, on SL_{5AB} at 0.01 level of confidence, on SL_{AB} at 0.05 level of confidence and on SL_{AB} at 0.01 level of confidence.

• The t-value is significant between NC males and NC females on SL_{5A} and SL_{5B} at 0.01 level of confidence.

• The chi-square value is significant for LD_{AAI} and LD_{AI} at 0.05 level of confidence on SL_A.

• The chi-square value is significant for LD_{AAI} & NC_{AI} at 0.05 level of confidence on SL_{AB}.

• The r values for SL_{1AB} are significantly positive with n-Ach, SE_T, SH_T, ST_{1AB}, ST_{2AB}, ST_{3AB}, ST_{4AB}, ST_{5AB} and MARKS.

• The r values for SL_{2AB} are significantly positive with n-Ach, SH_T, ST_{1AB}, ST_{2AB}, ST_{3AB}, ST_{4AB}, ST_{5AB} and MARKS.

• The r values for SL_{3AB} are significantly positive with n-Ach, ST_{1AB}, ST_{2AB}, ST_{3AB}, ST_{4AB}, ST_{5AB} and MARKS.

• The r values for SL_{4AB} are significantly positive with ST_{1AB}, ST_{2AB}, ST_{3AB}, ST_{4AB} & ST_{5AB}.

• The r values for SL_{5AB} are significantly positive with ST_{1AB}, ST_{2AB}, ST_{3AB}, ST_{4AB}, ST_{5AB} and MARKS.

• The r values for SL_{AB} are significantly positive with n-Ach, SE_T, SH_T and MARKS.

**Styles of Thinking**

• The t-value is significant between NC and LD on ST_B at 0.05 level of confidence and between NC_{AAI} and LD_{AAI} on ST_{5AB} at 0.05 level of confidence.
• The t-value is significant between LD_AL and LD_HI on ST_IB at 0.05 level of confidence, on ST_3AB at 0.01 level of confidence, on ST_4AB, ST_B and ST_AB at 0.05 level of confidence.
• The t-value is significant between LD_AAI and LD_HI on ST_3B at 0.05 level of confidence, on ST_3AB and ST_4AB at 0.01 level of confidence, on ST_AB at 0.05 level of confidence.
• The t-value is significant between LD males and LD females on ST_1AB at 0.01 level of confidence, on SL_4AB at 0.05 level of confidence, on ST_5AB and ST_AB at 0.01 level of confidence.
• The t-value is significant between NC males and NC females on ST_IB at 0.05 level of confidence.
• The chi-square value is significant for LD_AL at 0.05 level of confidence and for NC_A at 0.01 level of confidence on ST_A.
• The chi-square value is significant for LD_AAI at 0.01 level of confidence and for LD_AAI at 0.05 level of confidence on ST_B.
• The r values for ST_1AB are significantly positive with n-Ach, SE_T, SL_1AB, SL_2AB, SL_3AB, SL_4AB, SL_5AB and MARKS.
• The r values for ST_2AB are significantly positive with SL_1AB, SL_2AB, SL_3AB, SL_4AB & SL_5AB.
• The r values for ST_3AB are significantly positive with n-Ach, SE_T, SL_1AB, SL_2AB, SL_3AB, SL_4AB & SL_5AB.
• The r values for ST_4AB are significantly positive with n-Ach, SE_T, SL_1AB, SL_2AB, SL_3AB, SL_4AB, SL_5AB & MARKS.
• The r values for ST_5AB are significantly positive with n-Ach, SE_T, SH_T, SL_1AB, SL_2AB, SL_3AB, SL_4AB, SL_5AB and MARKS.
• The r values for ST_AB are significantly positive with n-Ach, SE_T & MARKS.

Self-Esteem
• The t-value is significant between NC and LD on SE_SOC and SE_T at 0.05 level of confidence.
• The t-value is significant between the entire sample of males (N_M=110) and the entire sample of females (N_F=86) on SE_SOC at 0.05 level of confidence.

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• The t-value is significant between NC males and NC females on SE_sch at 0.01 level of confidence.

• The chi-square value is significant for NC_aai on SE_T at 0.01 level of confidence.

• The r values for SE_T are significantly positive with n-Ach, SL_1AB, SL_2AB, ST_1AB, ST_3AB, ST_5AB, SH_T and MARKS.

**Study Habits**

• The t-value is significant between NC and LD on SH_vi at 0.05 level of confidence.

• The t-value is significant between NC_aai and LD_aai on SH_i and SH_y at 0.05 level of confidence.

• The t-value is significant between LD_aai and LD_hi on SH_i at 0.01 level of confidence.

• The t-value is significant between NC_ai and NC_hi on SH_vii at 0.01 level of confidence.

• The t-value is significant between NC_aai and NC_hi on SH_vii at 0.01 level of confidence.

• The t-value is significant between the entire sample of males (N_m=110) and the entire sample of females (N_f=86) on SH_vii at 0.05 level of confidence, on SH_viii at 0.01 level of confidence and on SH_T at 0.05 level of confidence.

• The t-value is significant between LD males and LD females on SH_vii 0.05 level of confidence.

• The t-value is significant between NC males and NC females on SH_viii at 0.01 level of confidence and on SH_T at 0.05 level of confidence.

• The chi-square value is significant on SH_T for LD_A1, NC_Ai and NC_aai at 0.01 level of confidence and for LD_hi at 0.05 level of confidence.

• The r values for SH_T are significantly positive with n-Ach, SL_1AB, SL_2AB, SL_3AB, ST_5AB, SE_gen, SE_soc, SE_hs, SE_sch, SE_T and MARKS.

**Academic Achievement (MARKS)**

• The t-value is significant between NC and LD at 0.01 level of confidence, between NC_Ai and LD_Ai at 0.01 level of confidence, between NC_aai and
LD_{AAI} at 0.05 level of confidence and between NC_{HI} and LD_{HI} at 0.01 level of confidence.

- The t-value is significant between LD_{AI} and LD_{AAI} at 0.05 level of confidence and between LD_{AI} and LD_{HI} at 0.05 level of confidence.

- The t-value is significant between NC_{AI} and NC_{HI} at 0.01 level of confidence and between NC_{AAI} and NC_{HI} at 0.05 level of confidence.

- The t-value is significant between the entire sample of males (N_M=110) and the entire sample of females (N_F=86) at 0.01 level of confidence and between LD males and LD females at 0.01 level of confidence.

- The r values for MARKS are significantly positive with SPM, n-Ach, SL_{1AB}, SL_{2AB}, SL_{3AB}, SL_{5AB}, SL_{AB}, ST_{1AB}, ST_{3AB}, ST_{AB}, SE_T & SH_T.

- The comparison between LD and NC of the observed frequencies in 1st, 2nd & 3rd division categories reveals that the percentage of LD in the category of 1st division is low as compared to the NC across the levels of intelligence (i.e., AI, AAI & HI). On the other hand the percentage of LD in the category of 3rd division is high as compared to NC across the levels of intelligence (i.e., AI, AAI & HI).

CONCLUSIONS

On the basis of findings of the present investigation, the following variable-wise conclusions can be drawn:-

Incidence of LD

The overall 13.52% (approx.) of children having learning disabilities (LD) validates the high incidence of LD among children in light of the international guidelines and the estimates given by various researchers.

Achievement Motivation

Insignificant mean differentials between children having learning disabilities (LD) and normal children (NC) across levels of intelligence indicates that LD and NC do not differ significantly on achievement motivation scores.

On the basis of significant t-value between males and females it may be concluded that gender differentials exist on achievement motivation and that females
have significantly higher mean score on achievement motivation as compared to the males.

From the significant positive r values for n-Ach with styles of learning (SL1AB, SL2AB, SL3AB, SL4AB), styles of thinking (ST1AB, ST2AB, ST3AB, ST4AB), total self-esteem (SE), overall study habits (SH) & academic achievement (MARKS) it may be concluded that by enhancing or improving any one of these may have positive effect on the achievement motivation or vice versa.

**Styles of Learning**

From the significant mean differentials between NC and LD on style of learning - SL5B it may be concluded that as compared to the NC group, the LD group has significantly higher preference / liking for solving simple problems. The significant mean differentials between NC and LD on style of learning - SL5A imply that as compared to the LD group, the NC group has higher mean preference for understanding verbal explanations and learning by verbal instruction.

Among LD group, the significant mean differentials between LD and LD on styles of learning - SL3AB and SL4AB imply that as compared to the LD group, the LD group has higher mean preference for understanding verbal explanations and learning by verbal instruction and also more interest in inventing something new and imaginative, and solving complex problems.

The significant mean differentials between males and females (N=86) on SL1AB, SL2AB, SL3AB, SL4AB, SL5A, SL5B, SL6A and SL6B imply that males and females differ significantly on many components of the styles of learning. On the basis of the results it may be concluded that as compared to the males, the females have significantly higher mean on integrated understanding movements of action as well as verbal explanations and learning by verbal instruction as well as verbal instructions, they show significantly higher mean on integrated preference for learning experimentally as well as logically, liking for concrete learning as well as learning in abstract way, show significantly higher interest in improving upon something and solving simple problems, show significantly lesser interest in inventing something new and imaginative although they show significantly higher mean on integrated interest in improving upon something as well as inventing something new and
imaginative, they show lesser interest in solving complex problems although significantly higher mean on integrated interest in solving simple as well as complex problems.

Further, the males have overall right hemispheric learning style dominance whereas the females have overall integrated hemispheric learning style dominance.

From the significant chi-square value for LDA and NCA on SL it may be concluded that observed frequencies are not incidental but indicate marked preference and that the observed frequencies differ significantly from those expected if SL is supposed to be distributed normally.

Similarly, the significant chi-square values for LDAA and NCA on SL imply that the observed frequencies of these groups differ significantly from those expected if overall integrated hemispheric learning style dominance - SL is supposed to be distributed normally.

The significant positive r values of (i) SL1AB with MARKS, n-Ach, SE, SH, ST1AB, ST2AB, ST3AB, ST4AB & ST5AB, (ii) SL2AB with MARKS, n-Ach, ST1AB, ST2AB, ST3AB, ST4AB & ST5AB, (iii) SL3AB with MARKS, n-Ach, ST1AB, ST2AB, ST3AB, ST4AB & ST5AB, (iv) SL4AB with ST1AB, ST2AB, ST3AB, ST4AB & ST5AB, and (v) SL5AB with MARKS, ST1AB, ST2AB, ST3AB, ST4AB & ST5AB, and (vi) SLAB with MARKS, n-Ach, SE & SH indicate that integrated hemispheric learning style dominance – individual learning styles as well as overall learning styles – has significant positive relationship with academic achievement (MARKS), achievement motivation (n-Ach), styles of thinking (ST), self-esteem (SE) and study habits (SH). This implies that children who have integrated hemispheric learning style dominance (or who are ‘whole brained’) have higher mean on MARKS, n-Ach, ST, SE and SH as compared to the children with right hemispheric learning style dominance or left hemispheric learning style dominance.

**Styles of Thinking**

The significant mean differentials between normal children (NC) and children having disabilities (LD) on style of thinking - ST imply that LD group shows
significantly higher mean preference as compared to NC group for fractional approach, inductive learning, aggression / short temper.

Significant t-value between above average intelligent normal children (NC\textsubscript{AA}) and above average intelligent LD (LD\textsubscript{AA}) on ST\textsubscript{3AB} indicate that as compared to the LD group, the NC group has comparatively higher integrated strong memory and preference for the remembrance of images as well as language and higher integrated preference for outlining as well as summarizing.

On the basis of significant t-values between average intelligent LD (LD\textsubscript{AI}) and high intelligent LD (LD\textsubscript{HI}) on ST\textsubscript{1B}, ST\textsubscript{3AB}, ST\textsubscript{4B}, ST\textsubscript{4AB}, ST\textsubscript{B} and ST\textsubscript{AB}, it is evident that both the groups differ significantly from each other on these styles of thinking. It may be concluded that the LD\textsubscript{AI} group has significantly higher preference for fractional approach (instead of holistic approach), comparatively lesser integrated creative thinking and intellectuality, and higher on pessimistic view, aggression/short temper as compared to the LD\textsubscript{HI} group.

Further it may be concluded that the LD\textsubscript{AI} group has overall left hemispheric thinking style dominance whereas the LD\textsubscript{HI} group has overall integrated hemispheric thinking style dominance.

The significant t-values between LD\textsubscript{AA} and LD\textsubscript{HI} on ST\textsubscript{3B}, ST\textsubscript{3AB}, ST\textsubscript{4AB} and ST\textsubscript{AB} indicate that as compared to the LD\textsubscript{AA}, the LD\textsubscript{HI} group has comparatively more integrated creative thinking and intellectuality, intuitive as well as logical approach in judgments and also more integrated business like as well as playful approach in problem solving and also the LD\textsubscript{HI} group has comparatively more integrated optimistic & pessimistic view, passive as well as aggressive temper as compared to LD\textsubscript{AI} group.

Further it may be concluded that the LD\textsubscript{HI} group has overall integrated hemispheric thinking style dominance.

The significant t-value between LD males and LD females on ST\textsubscript{1AB}, SL\textsubscript{4AB}, ST\textsubscript{3AB} and ST\textsubscript{AB} indicate that as compared to the LD males, the LD females have significantly higher mean on integrated holistic and fractional approach, retention and recalling of numerical figures as well as shapes, integrated optimistic and pessimistic
Further, it may be concluded that the LD females have higher mean on overall integrated hemispheric thinking style dominance as compared to LD males.

From the significant chi-square value for $LD_{AI}$ and $NC_{AI}$ on $ST_A$, and the significant chi-square value for $LD_{AI}$ and $LD_{AAI}$ on $ST_B$, it may be concluded that observed frequencies are not incidental but indicate marked preference and that the observed frequencies differ significantly from those expected if $ST_A$ and $ST_B$ are supposed to be distributed normally.

The significant positive $r$ values of (i) $ST_{1AB}$ with $MARKS$, $n$-Ach, $SE_T$, $SL_{1AB}$, $SL_{2AB}$, $SL_{3AB}$, $SL_{4AB}$ & $SL_{5AB}$, (ii) $ST_{2AB}$ with $SL_{1AB}$, $SL_{2AB}$, $SL_{3AB}$, $SL_{4AB}$ & $SL_{5AB}$, (iii) $ST_{3AB}$ with $n$-Ach, $SE_T$, $SL_{1AB}$, $SL_{2AB}$, $SL_{3AB}$, $SL_{4AB}$ & $SL_{5AB}$, (iv) $ST_{4AB}$ with $SL_{1AB}$, $SL_{2AB}$, $SL_{3AB}$, $SL_{4AB}$ & $SL_{5AB}$, (v) $ST_{5AB}$ with $MARKS$, $n$-Ach, $SE_T$, $SH_T$, $SL_{1AB}$, $SL_{2AB}$, $SL_{3AB}$, $SL_{4AB}$ & $SL_{5AB}$, and (vi) $ST_{AB}$ with $MARKS$, $n$-Ach, $SE_T$ indicate that integrated hemispheric thinking style dominance – individual thinking styles as well as overall thinking styles – has significant positive relationship with $MARKS$, $n$-Ach, $ST$, $SE$ and $SH$. This implies that children who have integrated hemispheric thinking style dominance (or who are ‘whole brained’) may have higher mean on $MARKS$, $n$-Ach, $ST$, $SE$ and $SH$ as compared to the children with right hemispheric thinking style dominance or left hemispheric thinking style dominance.

**Self-Esteem**

The significant mean differentials between NC and LD on $SE_{SOC}$ and $SE_T$ indicate that the LD group has significantly lower social-peer self-esteem and significantly lower overall self-esteem as compared to the NC group.

From the significant mean differentials between males and females on $SE_{SCH}$, it may be concluded that as compared to the females, the males have significantly lower school-academic self-esteem.

From the significant chi-square value for $NC_{AAI}$ on $SE_T$ it may be concluded that the observed frequencies of this group differs significantly from those expected if $SE_T$ is supposed to be distributed normally.
The significant positive r values of \( SE_T \) with MARKS, \( n\text{-Ach} \), \( SL_{AB} \), \( ST_{AB} \), \( ST_{iAB} \), \( ST_{3AB} \), \( ST_{sab} \) & \( SH_j \) indicate that by enhancing or improving upon any one of these variables may result in overall improvement in \( SE_T \) or vice versa.

**Study Habits**

On the basis of significant mean differentials between NC and LD on \( SH_{vI} \) it may be concluded that as compared to the LD group, the NC group is significantly more capable of reading books in English with comparatively more facility and ease.

From the significant mean differentials between \( NC_{AAI} \) and \( LD_{AAI} \) on \( SH_V \) it may be concluded that as compared to the LD group, the NC group interacts significantly more with teachers/parents/friends.

The significant t-value between \( LD_{AAI} \) and \( LD_{HI} \) on \( SH_I \) implies that as compared to the \( LD_{HI} \) group, the study habit of \( LD_{AAI} \) group is better geared to comprehension.

The significant t-value between \( NC_{AI} \) and \( NC_{HI} \) on \( SH_{HI} \) implies that as compared to \( NC_{HI} \) group, the \( NC_{AI} \) group is more habitual/conditioned to the physical and situational characteristics they adopt for study.

The significant mean differentials between the males and females on \( SH_{viI} \), \( SH_{vII} \) and \( SH_I \) indicate significant gender differentials on study habits. These values imply that as compared to the males, the females have significantly higher mean on the habit of preparing study notes, higher mean on the study behaviour towards accomplishment of the tasks in a pre-decided time frame and that the females have significantly better/overall desirable study habits.

From the significant chi-square value for \( LD_{AI} \), \( LD_{HI} \), \( NC_{AI} \) and \( NC_{AAI} \) on \( SH_I \) it may be concluded that the observed frequencies of these groups differ significantly from those expected if \( SH_I \) is supposed to be distributed normally.

The significant positive r values of \( SH_T \) with MARKS, \( n\text{-Ach} \), \( SL_{1AB} \), \( SL_{2AB} \), \( SL_{AB} \), \( ST_{5AB} \), \( SE_{GEN} \), \( SE_{SOC} \), \( SE_{h} \), \( SE_{sch} \) & \( SE_T \) indicate overall desirable study habits may enhance or improve upon any one of these variables or vice versa.
**Academic Achievement (MARKS)**

The significant t-values between NC and LD, between NC<sub>A</sub> and LD<sub>A</sub>, between NC<sub>AA</sub> and LD<sub>AA</sub> and between NC<sub>H</sub> and LD<sub>H</sub> indicate that LD group has significantly lower academic achievement as compared to the NC group across the levels of intelligence.

The significant mean differentials between LD<sub>A</sub> and LD<sub>AA</sub> and between LD<sub>A</sub> and LD<sub>H</sub> indicate that among LD group, though the LD<sub>A</sub> children are achieving significantly low as compared to the LD<sub>AA</sub> and LD<sub>H</sub> children, but LD<sub>H</sub> children are not achieving significantly higher as compared to the LD<sub>AA</sub> children.

The significant t-values between NC<sub>A</sub> and NC<sub>H</sub> and between NC<sub>AA</sub> and NC<sub>H</sub> indicate that among NC group, the NC<sub>H</sub> children are achieving significantly higher that NC<sub>A</sub> and NC<sub>AA</sub>.

From the significant mean differentials between males and females and particularly between LD males and females, it may be concluded that significant gender differentials exist wherein the females are achieving significantly higher than their male counterparts.

The significant positive relationship of academic achievement with intelligence, achievement motivation, styles of learning, styles of thinking, self-esteem and study habits imply that enhancing or improving any one of these may result in the improved academic performance.

The comparison between LD and NC of the observed frequencies in 1<sup>st</sup>, 2<sup>nd</sup> & 3<sup>rd</sup> division categories across the levels of intelligence reveals that there is marked discrepancy between the ability and achievement of the LD group. At all the three levels of intelligence, i.e., average, above average and high intelligence, LD children have markedly lower achievement as compared to their NC counterparts.

**Intelligence**

In the present investigation, intelligence did not significantly correlate with any variable other than academic achievement. On the basis of this finding, it may be concluded that preference for a particular style of learning or style of thinking is not a function of intelligence. Also, achievement motivation and self-esteem has nothing to do with intelligence. Further, that intelligence has nothing to do with the choice or
development of particular study habit. In short, intelligence does not affect/influence behavioural characteristics.

EDUCATIONAL IMPLICATIONS

Ever since the learning disabilities were identified, the researchers had shown tremendous interest in this field in order to get better insights into the problems of people suffering from these. In the present era of knowledge explosion, the worldwide-web surfing has made it possible that a single mouse click can take you to the millions of sites which have ready information on the probable causes of learning disabilities, innovative techniques to overcome some of the problems and also opens the door to the clubs or organizations which are specifically dedicated to learning disabilities and the individuals having learning disabilities.

Today an enormous mass of information is available on the topic but still a lot more needs to be known and most importantly what is known needs to be disseminated to masses in general and parents, teachers, counselors, policy makers, etc. in particular.

The present study has revealed that approximately 13.52% children of our classrooms are having learning disabilities, but due to the lack of awareness on part of teachers and parents and lack of initiative on part of administrators, these children are at the suffering end. Despite their potentials, children having learning disabilities are being gradually pushed back.

The characteristic behavioural differentials that have emerged as significant between children having learning disabilities and the normal children highlight the importance of paying attention to those behavioural characteristics. As teachers of children having learning disabilities, the major concern should be to adjust the teaching techniques or styles so as to accommodate the behavioural characteristics of these children. At the same time, team effort of teachers, parents and peers is required in order to help these children perform to the best of their potentials.

As has been reasonably established by the findings of this study that there is a marked discrepancy between the ability and achievement of the children having learning disabilities, it is time that policy makers and especially the curriculum frame-workers explore the means to bridge this gap between ability and achievement.
This study offers a way to reduce the discrepancy between ability and achievement on the basis of correlation coefficient results. Academic achievement has been found to be significantly and positively correlated with the behavioural characteristics undertaken for study in the present work, thereby stressing the need to teach the children having learning disabilities giving due consideration to their preferred styles of learning, styles of thinking and choice of study habits.

Also, since some of the study habits are more desirable for better academic outcomes, efforts should be made to improve the study habits and gradually replace the undesirable ones.

Parental involvement in education is the first crucial and most enduring ingredient for the continuing motivation of students. Individual teacher may also foster achievement motivation in students through reflective practice, adjusting teaching methods to student needs, allowing students’ choices, providing a forum for discovery, enhancing self-esteem, and creating a caring, respectful, and trusting classroom environment based on positive communication.

Self-esteem is another important factor. Children with learning disabilities usually carry negative self perceptions. It has been found that children with learning disabilities have significantly lower overall self-esteem. Their self-esteem related to school-academic is particularly and significantly low as compared to their counterparts. The findings stress the need to enhance the self-esteem of these children by making them feel good about themselves. Teachers must, therefore, teach strategies that allow students to develop successful attributes and implement academic strategies to improve academic skills.

The findings of the present study stress the need to understand the behavioural characteristics of the children having learning disabilities which differentiate them from other normal children. Continuous emphases on the children’s weaknesses adversely impact their personality. Therefore, there is a need to chalk out a rich and stimulating curriculum that identifies and nurtures their strengths and talents.

The need of the hour is to spread awareness at massive level. ‘Taare Zamin Par’ – a recent Hindi film release is an applaudable work which has not only brought the problem of learning disabilities into the lime light, but has also generated curiosity.
and concern among parents and teachers to understand the problem. This understanding of their weaknesses and strengths would be one step forward towards the welfare of children with learning disabilities.

Awareness is just one step, a long distance is yet to be covered. Extensive research in this field is required in order to work out the strategies which might prove beneficial for the children having learning disabilities.

SUGGESTIONS FOR FURTHER RESEARCH

Temporally and spatially, it is practically not feasible for a single researcher to cover all the variables related to a specific area of investigation. There remains scope for further work even within the variable already studied. Many a times, replication of the research already done is warranted in order to verify and confirm the previous findings. Considering these and the findings of the present study, the researcher has following suggestions for those who intend to conduct further research in this area:-

- In the present study the researcher had not studied the behavioural differentials by classifying the LD children into different types of learning disabilities categories. Further research may be conducted by categorizing the LD children as per different types of learning disabilities and behavioural differentials may be studied among those groups, e.g., study of behavioural differentials between children suffering from dyscalculia and those suffering from dysgraphia, etc.

- The DTLD provides for identification of ten problem areas, e.g., eye-hand coordination, figure-ground perception, position in space, etc. These problem areas may be studied in relation to academic achievement in various school subjects, e.g., languages (English, Hindi, Punjabi), science, mathematics, drawing, etc.

- Since almost all the behavioural characteristics undertaken in the present study are not permanent/fixed traits, researcher suggests that longitudinal studies may be conducted on these variables in relation to the academic outcomes.

- In recent past, researchers have raised doubts and have questioned the discrepancy criteria between ability and achievement for identification of
learning disabilities. However, the present study has reasonable evidence to conclude contrary to these doubts. Further research may be conducted to alleviate these doubts and verify the present findings.

- In the present study, the title contains ‘learning disabled’ and by the time the researcher awakened to this realization, it was too late because the title once approved could not be changed. For the future studies, it is suggested that labeling of children suffering from learning disabilities as ‘learning disabled’ should be avoided, instead ‘children with/having learning disabilities’ or, still better ‘children with/having learning difficulties’ should be used.