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CHAPTER V
SUMMARY AND SUGGESTIONS

5.1 INTRODUCTION
This chapter deals with the summary of previous chapters and the findings and suggestions of the present study. This chapter is organized under the following heading viz., the introduction, statement of the problem, needs and importance of the study, findings of the study, delimitations of the study, implications of the study, suggestions for further research and conclusions.

5.2 NEED AND IMPORTANCE OF THE STUDY
A beginning has just been made in India to investigate the effective instructional strategy for SLD in classroom. The lecture method, a major mode of instruction in classroom becomes difficult for many students, who are unable to understand the teaching in the form of verbal communication. Thus there is an urgent need for research in this area.

In this context, the investigator tried some of the Instructional strategies such as Conventional Teaching (CT), Computer Assisted Teaching Learning (CATL) and Experiential Learning (EL). Keeping this in mind, the investigator attempts to study the effectiveness of different instructional strategies to overcome learning difficulties of school students in the learning of Environmental science concepts with different learning styles.
5.3 STATEMENT OF THE PROBLEM

To study the effectiveness of different instructional strategies to overcome the learning problems of the students with different learning styles. The investigator has taken up the research problem entitled ‘EFFECTIVENESS OF CERTAIN INSTRUCTIONAL STRATEGIES ON THE ACHIEVEMENT OF LEARNING DIFFICULTY STUDENTS WITH DIFFERENT LEARNING STYLES’. This study attempts to compare the achievement performance among students in learning of Environmental science concepts through Conventional Teaching (CT) Computer Assisted Teaching Learning (CATL) and Experiential Learning (EL) instructional strategies.

5.4 DEFINITION OF THE TERMS USED IN THE STUDY

Learning Difficulties

There are several definitions given by different educationists. For instant, the United States office of Educational released the 1977 Federal Register which included the revised definition. ‘Specific Learning Disability’ means a disorder in one or more of the basic psychological processes involved in understanding or in using language, spoken or written, which may manifest itself in mathematical calculations.

In this study, the students with average and above average intelligence whose academic achievement is not on par with their acquired intelligence are considered students with learning difficulties. These students did not have any socio – economical backwardness and sensory and physical defects.
Learning Styles

According to R.Dunn ‘Learning style is the way each person begins to concentrate on absorb, process and retains new and difficult information and skills’. Every human being has a learning style regardless of their I.Q., achievement level or socio economic status and there are no ‘good’ or ‘bad’ learning styles.

Grasha (1996) has defined Learning styles as ‘Personal qualities that influence the student’s ability to acquire information, to interact with peers and the teacher, and otherwise particular in learning experiences’.

With this in view, in this study the investigator tried to find out the learning styles of students with learning difficulties by using Learning style Identification test developed by the investigator.

Instructional Strategy

According to Longman’s Dictionary of contemporary English (1995) ‘instruction’ refers to the printed information that tells you use a piece of equipment etc and ‘strategy’ refers to a ‘well planned series of actions for achieving an aim’. Instructional strategy refers to the process of helping students become self-regulated learners, individuals to have knowledge how they have to use effectively what they have learned.

In this study, instructional strategies refer to the skillful planning, execution and implementation of the comprehensive strategy
incorporating the appropriate technology to overcome learning difficulties of students with different learning styles in learning environmental science concepts. The investigator applies Computer Assisted Teaching Learning (CATL) and Experiential Learning (EL) instructional strategies to overcome learning difficulties in learning Environmental science concepts.

The investigator defines that

- CT instructional strategy is a traditional chalk and talk method. In this strategy, chalk and blackboard were used to teach environmental science concepts.

- CATL instructional strategy is an aid to teach environmental science concepts by using computer and software.

- EL instructional strategy is an activity oriented method to teach environmental science concepts and direct experience will be provided in the learning process.

**Effectiveness**

According to oxford dictionary (1975) Effectiveness is ‘being able to bring about the result intended.’ Chamber’s Twentieth Century Dictionary (1972) defines effectiveness as ‘being successful in producing a result or effect.’

As far as this study is concerned effectiveness refers to the impressive result produced in learning of Environmental science
concepts by the students with learning difficulties with different learning styles, consequent to the operation of instructional strategies. It also refers to the degree of realization of higher level attainment.

5.5 OBJECTIVES OF THE STUDY

1. To adopt tools and assess learning styles of students at the primary level.

2. To identify students with learning difficulties and assess learning styles of students at the primary level.

3. To develop certain Instructional Strategies [Computer Assisted Teaching Learning (CATL), Experiential Learning (EL) and Conventional Teaching (CT)] to teach Environmental science concepts to the students with learning difficulties.

4. To study the significance of different Instructional Strategies (CATL, EL and CT) on the post test achievement of students with learning difficulties especially with regard to their learning styles (Auditory, Visual and Kinesthetic).

5. To study the significance of different Instructional Strategies (CATL, EL and CT) on the retention ability of students with learning difficulties especially with regard to their learning styles. (Auditory, Visual and Kinesthetic).
6. To study the significance of the difference in the mental ability of the students with learning difficulties with regard to their learning styles (Auditory, Visual and Kinesthetic).

7. To study the significance of the relationship between mental ability and academic achievement (Post test scores) of the students with learning difficulties with different learning styles (Auditory, Visual and Kinesthetic).

5.6 HYPOTHESES OF THE STUDY

1. There will not be significant difference in the post test achievement of the students with learning difficulties with Auditory Learning Style learnt through different Instructional strategies [Conventional Teaching (CT), Computer Assisted Teaching Learning (CATL) and Experiential Learning (EL)].

2. There will not be significant difference in the post test achievement of the students with learning difficulties with Visual Learning Style learnt through different Instructional strategies [Computer Assisted Teaching Learning (CATL), Experiential Learning (EL) and Conventional Teaching (CT)].

3. There will not be significant difference in the post test achievement of the students with learning difficulties with Kinesthetic Learning Style learnt through different Instructional strategies [Experiential Learning (EL), Computer Assisted Teaching Learning (CATL) and Conventional Teaching (CT)].
4. There will not be significant difference in the retention test achievement of the students with learning difficulties with Auditory Learning Style learnt through different Instructional strategies [Conventional Teaching (CT), Computer Assisted Teaching Learning (CATL) and Experiential Learning (EL)].

5. There will not be significant difference in the retention test achievement of the students with learning difficulties with Visual Learning Style learnt through different Instructional strategies [Computer Assisted Teaching Learning (CATL), Experiential Learning (EL) and Conventional Teaching (CT)].

6. There will not be significant difference in the retention test achievement of the students with learning difficulties with Kinesthetic Learning Style learnt through different Instructional strategies [Experiential Learning (EL), Computer Assisted Teaching Learning (CATL) and Conventional Teaching (CT)].

7. There will not be significant difference in the mental ability of the students with learning difficulties with regard to their different learning styles (Auditory, Visual and Kinesthetic).

8. There will not be significant relationship between mental ability and academic achievement (Post test scores) of the students with learning difficulties with Auditory Learning Style.
9. There will not be significant relationship between mental ability and academic achievement (Post test scores) of the students with learning difficulties with Visual Learning Style.

10. There will not be significant relationship between mental ability and academic achievement (Post test scores) of the students with learning difficulties with Kinesthetic Learning Style.

5.7 EXPERIMENTAL DESIGN

The experimental design of Pre test – Post test – Retention test was used in the study to know the relative effectiveness of Instructional strategies. The dependent variables of this experiment are retention of information gained by SLD learnt through different Instructional strategies (CT, CATL and EL).

The total number of 3762 V standard students were selected from 21 Matriculation schools. Among 3762 students, 427 Students with learning difficulties were identified. Further, the identification of learning styles of all 427 SLD was done.

Among 427 SLD, 102 students were with Auditory learning style, 120 students were with Visual learning style, 162 students were with Kinesthetic learning style and 43 students were with mixed learning styles.
Out of 427 SLD with different learning styles, Mixed learning styles of 43 students were discarded. Only 285 SLD have been selected randomly from remaining 384 SLD, 94 students of Auditory learning style, 95 students of Visual learning style and 96 students of Kinesthetic learning style were considered for the study. The distribution of sample is given in the Table 3.3.

5.8 SAMPLE FOR THE STUDY

Out of 370 Matriculation schools of Coimbatore district, Tamilnadu, the investigator selected 3762 V standard students from 21 Matriculation schools. Among 3762 students, 427 Students with learning difficulties (SLD) were identified totally, out of 427 SLD, only 285 SLD were selected randomly for the study.

The academic achievement test marks obtained by 3762 students of 21 schools were subjected to the statistical analysis. The mean and standard deviation were calculated for all the 3762 students. Those scores lie below the one standard deviation from the group mean were considered as learning difficulty and further diagnosis was planned. Therefore systematic procedure with scientific method was followed in this study to confirm a student as a student with learning difficulty in learning of Environmental science concepts.

A total of 285 students were identified as SLD and they were selected for the study. To select these students, the investigator used purposive samplings technique these 285 students were distributed in V standards of 21 matriculation schools in Coimbatore District.
They were further divided into three groups namely Auditory learners (94 students), Visual learners (95 students) and Kinesthetic learners (96 students). Students with different learning styles were further split into 3 groups based on their instructional strategies (CT, CATL and EL).

5.9 TOOLS AND INSTRUMENTS USED FOR THE STUDY

The following tools and the instruments were used for the present study.

1. Achievement test

2. Mental ability test (Raven’s Standard Progressive Matrices (RSPM))

3. Learning style Identification test

4. Socio – economical information form

5. Snellen’s Chart (For Visual acuity testing)

6. Audiometer (For Hearing ability testing)

Therefore, six different types of tools and instruments have been used for this study. (For more details refer Chapter – III)
5.10 FINDINGS OF THE STUDY

i. There is significant difference in the post test performance of SLD with Auditory learning style among CT, CATL and EL groups. The SLD with Auditory learning style who were taught Environmental science concepts through CT and CATL strategies scored better than the students in the EL group. It indicates that CT and CATL strategies are effective for SLD with Auditory learning style and these strategies are better than EL strategy to teach Environmental science concepts.

ii. There is significant difference in the post test performance of SLD with Visual learning style among CT, CATL and EL groups. The SLD with Visual learning style who were taught Environmental science concepts through CATL and EL strategies scored better than the students in the CT group. It indicates that CATL and EL strategies are effective for SLD with Visual learning style and as an instructional strategy it is better than other one applied strategy. The better performance of SLD with Visual learning style can be ascribed to the effectiveness of CATL and EL strategies as an Instructional strategy.

iii. There is significant difference in the post test performance of SLD with Kinesthetic learning style among CT, CATL and EL groups. The SLD with Kinesthetic learning style who were taught Environmental science concepts through EL strategy scored better than the students in the CT and CATL groups. It
indicates that EL strategy is effective for SLD with Kinesthetic learning style and as an instructional strategy it is better than the other two applied strategies.

iv. There is significant difference in the retention test performance of SLD with Auditory learning style among CT, CATL and EL groups. The SLD with Auditory learning style who were taught Environmental science concepts through CT and CATL strategies scored better than the students in the EL group. It indicates that CT and CATL strategies are effective for SLD with Auditory learning style and these strategies are better than EL strategy in retention test performance.

v. There is significant difference in the retention test performance of SLD with Visual learning style among CT, CATL and EL groups. The SLD with Visual learning style who were taught Environmental science concepts through CATL and EL strategies scored better than the students in the CT group. It indicates that CATL and EL strategies are effective for SLD with Visual learning style and these strategies are better than CT strategy in retention test performance.

vi. There is significant difference in the retention test performance of SLD with Kinesthetic learning style among CT, CATL and EL groups. The SLD with Kinesthetic learning style who were taught Environmental science concepts through EL strategy scored better than the students in the CATL and CT groups.
It indicates that EL strategy is effective for SLD with Kinesthetic learning style and this strategy is better than CATL and CT strategies in retention test performance.

vii. There is no significant difference among the mental ability of SLD with Auditory, Visual and Kinesthetic learning styles. It indicates that mental ability of SLD with different learning styles showed no significant difference.

viii. There is no significant relationship between the mental ability and academic achievement (Post test) of SLD with Auditory, Visual and Kinesthetic learning styles. It indicates that relationship between mental ability and academic achievement of SLD with different learning styles showed no significant difference.

5.11 SUMMARY OF FINDINGS
In this study, the investigator analysed and summarized the findings here.

The CT and CATL Instructional strategies are effective in the post test performance of students with learning difficulties (SLD) with Auditory learning style.

The CATL and EL instructional strategies are effective in the post test performance of SLD with visual learning style.
The EL instructional strategy is effective in the post test performance of SLD with Kinesthetic learning style.

The CT and CATL strategies are effective in the retention test performance of SLD with Auditory learning style.

The CATL and EL strategies are effective in the retention test performance of SLD with Visual learning style.

The EL strategy is effective in the retention test performance of SLD with Kinesthetic learning style.

The mental ability of SLD and their learning style (Auditory, Visual and Kinesthetic) showed no significance.

The relationship between mental ability and academic achievement (Post test scores) of SLD with Auditory learning style showed no significance in their performance.

The relationship between mental ability and academic achievement (Post test scores) of SLD with Visual learning style showed no significance in their performance.

The relationship between mental ability and academic achievement (Post test scores) of SLD with Kinesthetic learning style showed no significance in their performance.

5.12 DELIMITATIONS OF THE STUDY

1. The study is confined to 5th standard students only.

2. Since the present study is experimental in nature, the size of the sample selection is limited.

3. The SLD of the English medium only in Coimbatore area are considered for this study.

4. Only selected software package and experiential learning instructional kit have been made use of in the study. It is worthwhile to repeat the experiment by using other kinds of instructional strategies and verify the results.

5.13 IMPLICATIONS AND SUGGESTIONS OF THE STUDY

- The present research would help the teachers to identify the students with learning difficulties (SLD) with different learning styles (Auditory, Visual and Kinesthetic).
- The present study would suggest to enhance the learning abilities and skills of SLD in learning of Environmental science concepts.

- The study would provide concrete suggestions to teachers, parents, Heads of the institutions and government organizations regarding with the steps to be taken for academic excellence of SLD.

- The limited research work has been conducted in the field of L.D. in India. The present study would be a great contribution in the field of special education in general and L.D. in specific.

- In this study, the effectiveness of different instructional strategies is studied and it would help the teachers to adopt the appropriate instructional strategies in the achievement of SLD.

- It is difficult to provide high - tech equipments for all the schools and this study would give ideas to the teachers to use the Instructional kits at low cost to meet the individual needs of their students.

- The teacher may acquire the knowledge of preparing various kinds of Instructional strategies for different subjects. Adequate training should be given to prepare the quality Instructional kits for SLD with different learning styles.
• Model kit and indigenous kit should be developed with the guidance of experts of National and State level institutions.

Suggestions for Auditory Learners
Auditory Learners learn best by hearing. The following suggestions would help the auditory learners to excel in their studies.

• Ask the auditory learners to select a quite place to study and they have to recite aloud as they can. They have to attend classes regularly.
• They can study in groups or with a friend and they can explain information of notes to their friends.
• They have to take the notes by themselves and they can use cassette’s or CD’s of lessons of various subjects for better learning.
• They have to practice and describe diagrams or practice answering test questions.
• They would recall information during exam by reciting the answers.

Suggestions for Visual Learners
Visual learners learn best by seeing. The following suggestions would enhance the visual’s learner’s ability to store and recall information.

• The visual learners are suggested to find good learning environment for study.
• They can write down always what they need to remember. This includes using notes as remainders and making a schedule to begin assignments.
• They can underline the keywords to understand the subject easily.
• They have to make use of class notes with drawings and symbols etc.
• They have to make use of text visuals such as charts and pictures to recall them from memory.
• They have to use study cards with written information organized into outlines, wild drawings or diagrams. They can review the information by writing.
• They can recall cue’s as visual as possible and recall information for exams by visualizing text pages, notes or study cards.

**Suggestions for Kinesthetic learners**

Kinesthetic learners learn best by doing and moving. The following suggestions would improve the efficiency of Kinesthetic learners in learning.

• They are suggested to select quite and neat environment for study.
• They have to use many of the senses as possible when they study: see, hear, touch, taste and smell and they have to move around while study.
• They can use study cards whenever they get time for learning and they can give themselves breaks and rewards.
• They have to make a schedule for effective learning and they have to take a break while they are learning for a long time for relaxation.
• They can set a goal as to specific amount of information they will cover.
• They may fix the charts with important information and diagrams in the home to recall the information easily by seeing very often.

Therefore, this study would help teachers, students, educational administrators, curriculum developers, teaching and guidance workers and counselors to provide effective instructional programme for SLD in the field of education for academic excellence.

It is found from the study that CT, CATL and EL Instructional strategies are effective for SLD with different learning styles to learn Environmental science concepts. Hence, the teachers and education department must consider this view for experimenting alternative teaching strategies for the benefits of SLD.

5.14 AREA FOR FURTHER RESEARCH

The present study has analysed into the Effectiveness of CT, CATL and EL Instructional strategies for SLD with different learning styles. It provides guidelines for many other areas which can be explored and investigated by further researchers. The following suggestions are made for further research in this area.
1. The present study was conducted for limited number of students with learning difficulties (SLD) with different learning styles. Similar studies can be conducted for large number of SLD with different learning styles.

2. The investigation was done for primary level classes only. Attempts can be extended to high school, higher secondary school and college levels.

3. A parallel studies can be conducted to find out the effectiveness of different instructional strategies on achievement of SLD with different learning styles for further examination.

4. Indepth studies can be undertaken for SLD with different learning styles for other subjects also by implementing difficult instructional strategies.

5. From the findings of Instructional approach of CT, CATL and EL on achievement of SLD with different learning styles, it is suggested that studies can be attempted to find out other areas like creativity, personality, aptitude and interest etc.

6. This study was attempted to develop instructional materials for teaching Environmental science concepts only. Similar studies can be made on innovative strategies for other subjects also.
7. Separate studies can be conducted to find out the problems of SLD in all types of schools.

8. This study will help the teachers to perform their roles and responsibilities effectively in using of different instructional strategies.

9. The computer technology and internet facilities can be introduced to SLD to enhance the potentiality of learning.

10. To reduce the drop out ratio, necessary instructional packages can be provided to the school students.

11. The special inservice training programme for intensive training to the teachers in use of various instructional strategies can be given effectively by the training colleges.

12. To create awareness about learning difficulties the workshop and seminars can be conducted for teachers and parents.

13. The Education department may set up a separate department to conduct educational survey for the welfare of SLD.

14. By providing adequate facilities need based service training, financial support, reduction of class size and work load, special attention can facilitate effective teaching of SLD. It is suggested, schools to take special efforts to provide necessary
and suitable modern instructional materials like software, audiovisual equipment and experiential learning materials for teaching various subjects.

15. It is recommended that the administrator of the school has to appoint clinical psychologist for giving proper guidance and counseling to the students and parents.

16. A parallel study can be conducted to assess the effectiveness of CATL and EL approach with reference to all the students including average, above average and slow learners.

17. A correlation study can be done to assess the relationship between the mental ability and academic achievement with regard to their different learning styles of average students, above average students and slow learners.

18. A parallel study can be made covering the full syllabus of a particular subject and internal analysis can be done.

19. A comparative study can be made in rural and urban area school students.

20. Studies can be taken up in other districts also for more accuracy and better reliability. Similar studies can also be attempted at state and national level.
21. Studies on normal student’s attitude towards their peers with SLD may be attempted.

22. Experimental studies can be undertaken to evolve a special instructional strategy to teach students with learning difficulties. The effectiveness of such strategy and its advantage over traditional lecture method can also be measured.

23. Separate studies can be attempted to probe into causes of L.D. and remediation can be suggested for implementations.

24. A separate study can be undertaken to assess how far the general education classroom strategy reaches out to the SLD in an inclusive education setting. Such studies can suggest remedial measures of teaching and learning techniques to overcome L.D at primary level.

25. It is suggested that the Heads of the institutions to take special efforts to provide necessary and suitable modern instructional materials like software, audio-visual equipments and experiential learning materials for teaching various subjects.

5.15 CONCLUSIONS

Teaching and learning processes must help in the growth and development of children. The significance of the role of teachers is to employ suitable strategies and techniques for students with learning
difficulties with different learning styles in the learning of Environmental science concepts.

When different kinds of instructional strategies are used, they provide greater educational opportunities for the children. Various kinds of instructional strategies help in bringing new kinds of experience for the children to make education more interesting. The SLD must be identified and special education must be provided for academic excellence.

In the present study, SLD were identified with different learning styles. The identification of learning difficulties is quite essential to inculcate proper thinking and corrective methods among the students with learning difficulties. Hence the curriculum for special education must be provided in all educational institutions.

This research study reveals that SLD with different learning styles learnt Environmental science concepts effectively through CATL and EL instructional strategies, Hence the teachers must take efforts to use the different kinds of instructional strategies for SLD to excel in their studies.