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CHAPTER VI
SUMMARY

6.1 INTRODUCTION

The present study is entitled, ‘Effectiveness of Different Remedial Measures to Improve spellings of Fourth Graders with Learning Disability’.

The term learning disability is meant to identify children with a severe discrepancy between ability and achievement.

A learning disability refers to one or more significant defects in essential learning processes requiring special educational techniques for its remediation. Some chief learning disabilities include difficulties in communication skills, reading comprehension, speech, writing, spelling, thinking, listening, arithmetic and these disabilities can be found in large number of children who may otherwise be within normal range of intelligence.

According to Hammill et al (1981) “learning disability is a generic term that refers to a heterogeneous group of disorders manifested by significant difficulties in the acquisition and use of listening, speaking, reading, writing, reasoning or mathematical abilities. Those disorders are intrinsic to the individual and presumed to be due to central nervous system dysfunction. Even though a learning disability may occur concomitantly with other handicapping conditions (e.g. Sensory impairment, mental retardation, social and emotional disturbance) or environmental influences (e.g. cultural differences insufficient/ inappropriate instruction, psychogenic factors) it is not the direct result of those conditions or influences”.

There is a general agreement about some of the basic dimensions related to disorder. These dimensions have been summarized as follows (Berdine and Blackhurst, 1985).
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1) **Discrepancy:** There is a difference between what these students should be able to do and what they are actually doing.

2) **Deficit:** There are some tasks others can do that a learning disabled can’t do such a listen, read or to do arithmetic.

3) **Focus:** The child’s problem is centered around one or more of the basic psychological process involved in using or understanding language.

4) **Exclusion:** These problems are not direct result of poor vision or hearing, disadvantage or retardation but these students still are not learning.

In reviewing any list of characteristics of LD children, one must remember that the single, common characteristics of children with learning disabilities is a specific and significant achievement deficiency in the presence of adequate overall intelligence. Some learning disabled children will also be hyperactive (or show any of other cited characteristics) and some will not. Children with any of these characteristics who do not have deficits in achievement would not be considered learning disabled.

Learning disability can be of various types : 1) Dysgraphia 2) Dyslexia 3) Dyscalculia

In addition to this, there are others terms described in the literature viz. agnosia, dysphasia, aphasia, dyspraxia and apraxia to describe some categories of learning disabilities.

**SPELLING DISABILITY**

Spelling is the ability to use letters to construct words in accordance with the accepted rules. Spelling is defined as the process of representing language by means of writing system or orthography. It aids in the reproduction of the spoken word. A poor speller is at a clear disadvantage in today’s school system, as he finds it difficult to
communicate effectively using the written media, and several ambiguities result due to his misspellings, which are manifested in all subject areas.

Learning to spell is part of the integrated language system and depends upon the child's activity as a reader, writer, speaker and listener in a purposeful environment of learning.

As early as 1953, Hanna and Moore reported that our system of writing was basically alphabetic and for almost every sound there is a highly regular spelling. An analysis of 3,381 monosyllables and the separate syllables of 2,396 polysyllables in words from the many spellings lists shows that the English language is 86.9% phonetic (Anderson and Lapp, 1988).

Spelling and reading have different roots in development (Bradley and Bryant, 1985). To spell a word correctly, the individual must not only have stored it in memory but also be able to retrieve it completely. Initially spelling is primarily a phonological skill and reading a visual one. By the age 7 or 8 years, the visual and phonological elements become fixed and the child uses both processes that is why at this stage spelling difficulties are noted.

Spelling disability is of three types.

1) **Dysphonetic dyslexia (phonetically inaccurate spellings)**

   The errors of these children include the correct letters but the letters are placed in bizarre positions, such as ronaeg for orange; lghit for light; heows for whose. This type of error reflects a primary deficit in sound symbol integration. Student with this problem read and spell primarily through visualization.

2) **Dyseidetic dyslexia (phonic equivalent errors)**

   The misspellings of these children include mistakes such as lisen for listen, atenchen for attention, pese for pease, det for debt,
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and shofer for chauffer. This type of error reflects primary deficits in ability to perceive and recall whole word as a gestalt. Students with this problem read and spell primary through the process of phonic analysis.

3) Dysphonetic-dyseidetic dyslexia (mixed type, both kinds of errors)

Students with these error patterns make both types of errors and they are considered the most severe cases.

6.2 RATIONALE OF THE STUDY

Spelling is one curriculum area in which neither creativity nor divergent thinking is encouraged. Only one pattern or arrangement of letters is accepted as correct, there is no compromise or leeway.

Spelling is such a component in the school curriculum that is needed in all the subjects and though the child may be knowing the answer properly but due to poor spelling may not be able to communicate effectively what and the way he wants to. So, remediating spelling errors for overall improvement is very important.

The children having problems in spelling will not be able to write correctly, will not understand the content properly and hence will lack interest in the subject. Thus they will not be academically sound. Learning disabled students are likely to send and receive negative verbal messages more than their normal counterparts (Bryan and Bryan, 1978). Since the problem of making mistakes in spelling pervades all areas of school curriculum, they receive these negative messages from all corners. Hence improving spellings will build up confidence in the child.

Various school teachers admit that spelling errors are very common among the children of lower classes. So, it becomes in the
present context, even more important to investigate effectiveness of various techniques to improve spelling performance.

Spelling knowledge affects reading tremendously. Reading in present times is an important tool of life. Since correct reading, then assumes importance, improving the spelling ability of students is of utmost importance.

Not abundant studies could be traced on remediation of spelling disabilities while scanning literature. Thus the importance of the present problem cannot be overestimated.

6.3 STATEMENT OF THE PROBLEM

The problem is stated as follows “Effectiveness of different remedial measures to improve spellings of fourth graders with learning disability”.

6.4 OBJECTIVES OF THE STUDY

The main objectives of the study were as follows:

1) To standardize spelling test to use in identification of spelling disabled children.
2) To identify spelling disabled children from regular school going children.
3) To prepare remedial measures to reduce the spelling disability.
4) To administer remedial measure to the identified children.
5) To study the effect of remedial measures to ameliorate spelling problems.
6) To compare the relative effectiveness of various measures in remediating spellings.
7) To assess the stability of gains due to experimental treatment via administering delayed post tests.
8) To examine whether anticipated changes due to remediation in spellings are transferred to performance in English.
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9) To examine the difference in the number of trials taken to learn spellings of equal magnitude in three groups.

6.5 HYPOTHESES

Following hypotheses were framed:

1) There will be a significant difference in spelling performance of subjects at pre test and post test level in phonetic group.
2) There will be a significant difference in spelling performance of subjects at pre test level and posttest level in visual groups.
3) There will be a significant difference in spelling performance of subjects a pre test level and post test level in mixed groups.
4) There will be a no difference in gains at post test level for three groups i.e. phonetic, visual and mixed.
5) There will be no difference in performance at post test level and delayed post test levels.
6) There will be no difference in achievement in English in general before and after the treatment.
7) There will be no difference in the number of trails taken to learn the spelling task of equal magnitude in the three groups.

6.6 DELIMITATIONS OF THE STUDY

(i) The present study was delimited to CBSE schools.
(ii) Due to the elaborate identification procedure, sample size was limited to 39 students.
(iii) The study was limited to geographical area of Chandigarh only.

6.7 DESIGN OF THE STUDY

A pretest posttest experimental design was used. The purpose of using this design was to see the effect of three remedial treatments i.e.

1. TAK/v
2. Visual orthographic method
3. Listen, speak, Read & write (LSRW) method
There were three experimental groups accordingly, namely:

- Dyseidectic spellers (phonetic group)
- Dysphonetic spellers (visual group)
- Mixed group

Each group had 13 children. These experimental groups served as control for each other.

The dependent variable in this study was achievement in spellings and independent variable was remedial measures.

All three groups served as comparison groups for each other. As the number of subjects available was small, researcher could not afford a control group. All the groups had boys and girls mixed in them. A pre test was administered before the onset of experiment and post test at the end of the treatment period. Delayed post test one and Delayed post test two were employed to examine the stability of effects of experimental treatment. The scores of subjects on achievement in English as a subject were procured from school to investigate the transfer effects of the treatment, before and after the experimental treatment.

### 6.8 TOOLS AND TECHNIQUES

The following tools and techniques were employed in the present study to identify children & collect data.

#### 6.8.1 TOOLS

1. CPM, Coloured progressive matrices (Ravens et al, 1977)
2. Diagnostic test for learning disability (DTLD) (Mehta and Swarup, 1993)
3. Identifying tool of word spelling (Constructed by investigator)
4. Tailor made Individual test on spellings (used during remedial sessions, Constructed by Investigator)
5. Teachers’ Referral from (prepared by investigator for teachers)
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6.8.2 TECHNIQUES

Three techniques have been used, observation, analysis of errors and remedial techniques.

Observation: Researcher observed the subjects on the basis of characteristics of Learning disabled given by Traver and Hallahan (1976), throughout the sampling for clues before remediation.

Analysis of Errors to classify Children: Classification of children was based on the kinds of errors 1) Dyseidetic 2) Dysphonetic 3) Mixed type. Classification was based on the majority of errors for example, if the child made 14 errors of one kind and one error of the other kind, he was classified on the basis of 14 errors of one kind.

Remedial Techniques – There were three remedial techniques.

1. TAK/V method
2. Visual orthographic method
3. Listen, speak, Read & Write Method

These were used to remediate spellings among identified children.

These techniques required some materials which are mentioned below

- Flashcards bearing words.
- Flashcards showing words with tactile surface
- Cards bearing alphabets with tactile surface

6.9 SAMPLE

Purposive sampling was utilized to select subjects. The total sample of the study comprised of 39 learning disabled children, selected from regular school going children of 4th standard, having average or above average intelligence, manifesting traits of learning disabled children and significant deficits in their spelling skills as compared to their classmates and as compared to their performance in mathematics.
CRITERIA FOR SAMPLE SELECTION

The study required a sample of spelling disabled children. Since the spelling disability is a type of learning disability, it was necessary that the subjects be subjected to the criteria of learning disability. The following criteria were used for the identification of sample from regular school.

1) Average or above average intelligence
2) Exclusion of sensorial handicaps. No subject manifested any sensorial handicaps. It was tested informally. Subject was made to read from writing board from a distance and from textbook. It was seen that they followed all routine instruction issued at a reasonably loud level e.g. “please open your book” “close the door”.
3) Performance equal to or below a score of 50 on DTLD.
4) Performance on spelling test below P20 level.
5) Discrepancy in performance in Mathematics and English (Higher than 0.64 Z)
6) A score equivalent to 60% or more on Teacher referral form (Most items in this tool were negative).

Procedure of Sample Selection: The sample was selected using the variety of tools & techniques as identification tool for spellings, DTLD, Intelligence test (CPM), Teacher’s referral form, classroom observation, children who had discrepancy in Math’s and spellings.

6.10 PROCEDURE FOR DATA COLLECTION

The present study was conducted in six phases: pre test, classification, compiling word list for administration of remedial techniques, remediation, post test, delayed post tests.

Pre test: Performance on identifying tool of word spellings served as a pre test also. Achievement scores of subjects in English were collected.

Classification into groups: The performance on identifying tool helped the investigator to know the types of mistakes the students
made. On the basis of their mistakes, subject was classified to 3 groups namely Dyseidetic (Phonetic), Dysphonetic (visual) and Mixed.

**Preparation of word list for remedial work:** In total, 30 errors have been selected for remediation from a tailor made individual test, class work, and from their exercise notebooks. This was a list unique to every child and was prepared according to requirements of classification criteria.

**Experimental treatment:** Experimental treatment started at the starting session of schools in the May and continued till October. Before treatment commenced subjects were requested to abstain from absenting themselves, otherwise they would miss some new and interesting activities. Each child was taken individually for treatment. From the complied test of words prepared by investigator each word was taken one by one.

Treatments given for 3 groups are as follows

1) TAK/v for Dyseidetic spellers (phonetic group)
2) Visual Orthographic method for Dysphonetic speller (visual group)
3) Listen, Speak, Read & Write method (LSRW) for mixed group.

**Post Test:** Identifying spelling test was given at the end of treatment after a gap of one day. At this time tailor made spelling test was also administered again. The post test were given to examine whether or not the remedial activities were beneficial in ameliorating the spelling problems among children.

**Delayed Post Test One (DPT1):** Delayed posttest after a gap of 3 weeks was given to subjects to test the retention effects of treatment.

**Delayed Post Test (DPT2):** DPT2 was given after 46 days of post test to check the long term effect (memory) of the treatment. Identifying tool of spellings was used for DPT1 and DPT2 stages.
At this time achievement scores of all 39 children in English were also collected to assess the changes in their performance and transfer effects of the remedial measures.

6.11 STATISTICAL ANALYSIS

In the present study different statistical techniques were employed to analyze the data keeping in view the objectives and hypotheses. For item analysis, discrimination index and item difficulty were calculated for each item to prepare identifying tool of spellings.

Descriptive statistics like mean, standard deviation, quartile deviation, skewness and kurtosis, percentiles; quartiles were computed for norms of the spelling test. For reliability and validity of the test, product moment method of correlation was used.

In order to study the effect of results, the analysis of variance was employed at various stages of the study: pre test, post test, delayed post tests on identifying tool of spellings.

Students’ t-test for independent and correlated means was employed to test the hypotheses and to find out the significance of difference between means of different groups if ANOVA indicated significant differences.

6.12 RESULTS

There results were discussed with reference to hypotheses and objectives. Data were collected on identifying tool for the following stages.

* Pre test
* Post test
* Delayed post test one (DPT₁)
* Delayed post test two (DPT₂) for all the three groups i.e. phonetic, visual and mixed.
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Analysis of variance (ANOVA) employed to see whether the subjects differ at pre test level on spelling performance, shows that F-ratio obtained was not significant. This indicated that the scores of three group did not vary from each other significantly. This provided an ideal condition of equality before subjects enter into experimental treatment for comparisons.

ANOVA of post test scores of identifying tool yielded in significant F-ratio. Though subjects have improved in mean scores, they have improved equally at the post treatment level. The treatment given was on tailor made individual spelling list and it was assumed that subject will apply that skill gained during remediation to attempt on identifying spelling test. And they did it all equally well.

Similarly, the overall differences in three groups at DPT1 and DPT2 stages were insignificant. Mean score also don’t show a marked change. Subject at whichever stage have faired consistently similarly in all three groups.

When ANOVA on all the data with 3x2 (groups x stage of testing) factorial design with repeated measures on second factor was (pre-post) employed, F ratio obtained on treatment was found insignificant. Groups as a variable were not causing any variation.

F-ratio for stages of testing (pre to post test) was found significant which indicated all the groups improved significantly at post test as compared to pre-test.

The interaction between groups and stages of testing was found insignificant.

3 x 2 ANOVA utilizing groups and stage of testing for scores on identifying tool yielded significant. F- ratio for pre test post test stages of testing. Hence, t ratio needed to be computed.

The analysis of data revealed that phonetic group after treatment improved significantly. The t-ratio was significant at 0.01.
level indicating that the treatment given for them was beneficial thus the hypothesis I stands supported.

A significant difference was found between pre test and post test means of visual group. The t-ratio of visual group was found to be significant at 0.01 level. It shows that visual group subjects have benefited from the visual orthographic technique given to them.

Thus the hypothesis II was confirmed.

Mixed group improved significantly. A significant difference was found between pre test and post test means of mixed group. The t-ratio of mixed group was found to be significant at 0.01 level.

The difference between the mean score of spelling performance at pretest stage and posttest stage showed that mixed group have benefited from the listen, speak, read and write (LSRW) treatment given to them.

Thus the hypothesis III was confirmed.

When ANOVA on gain scores in groups was conducted, the F-ratio obtained was insignificant. This implies that remediation in groups does not cause differential gains. They have gained equally well and all three technique have worked equally well. This confirmed the hypothesis number IV that there will be no difference in gain at post level for three groups i.e. phonetic, visual and mixed.

3x3 ANOVA (utilizing groups and stage of testing) for scores on identifying tool was employed to check the stability of effects of remediation. Repeated measures were obtained on second variable (i.e. post test, delayed post test one, delayed post test two). First DPT1, was given 21 days after PT and DPT2 was given after 25 days of DPT1.

Variables of groups (P, V, M) found to have insignificant variation. Variable of stage of testing (post test, DPT1, DPT2 score) was found to cause insignificant variation. This means the improvement they have
shown in post test after remediation, was retained for 3 weeks. \((DPT_1)\) and about 7 weeks \((DPT_2)\) thereby proving retention effects of treatments. Thus hypothesis V was supported. The interaction between the treatments and performance at various stages was found to be insignificant.

Insignificant differences in \(DPT_1\) and \(DPT_2\) of all groups on identifying tool also supporting that the experimental treatment has lasting effect of improvement in spellings.

At the time of \(DPT_2\) achievement scores of all 39 children in English were collected to assess the changes in their performance in English in general. This would help in knowing transfer effects of the remedial measures. \(t\)-ratio for correlated means indicated that all the subjects have shown significant improvement in English achievement.

This transfer effect rejects Hypothesis VI and confirms transfer effects of remedial measures.

\(F\)-ratio obtained on number of trials taken by three groups was insignificant. This revealed that subjects in three groups did not differ on the number of trials taken to learn task of equal magnitude.

This confirmed the hypothesis that there will be no difference in the number of trials taken to learn the spelling task in the three groups.

### 6.13 CONCLUSIONS

The following are the conclusions of the present study:

- A significant difference was found between pretest and post-test means of phonetic group. Thus, strategy TAK/v given for dyseidetic spellers (phonetic group) was useful for remediating spelling problems of learning disabled children.

- There was a statically significant difference in the spelling performance at pretest stage and post-test stage of dysphonetic
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(visual) group. This shows that subjects in visual group have benefited from the visual orthographic techniques.

- A significant difference was found between pretest and post-test means of mixed group. The difference between the mean score of spelling performance at pretest stage and post-test stage shows that listen, speak, read and write technique proved effective in ameliorating the deficiencies in spelling among children of mixed group.

- All the groups (P,V,M) have gained equally and all three techniques have worked equally well. Improvements due to strategies themselves do not relatively differ. All the techniques have equal effect in improving the spelling performance of the children.

- Insignificant differences were found between the post test, DPT_1 and DPT_2 of all groups on identifying tool, confirming the stability of gains due to experimental treatment. DPT_1 was administered 21 days after experimental pre-treatment and DPT_2 was administered 25 days after DPT_1. It indicates that the experimental treatments have long lasting effect on performance.

- Test of transfer of learning after experimental situation shows that the learning which occurred during experimental treatment gets transferred to performance in English in general.

- F-ratio obtained for number of trials in groups was insignificant. This revealed that subjects in three group did not differ on the number of trials taken to learn a task of equal magnitude.