...Review of Related Literature
CHAPTER II

REVIEW OF LITERATURE

Survey of related literature is an important pre-requisite to planning and implementation of a planned research project. According to Best (1981) “The search of reference material is a time consuming but fruitful phase. A familiarity with the literature of any problem area helps the student to discover what is already known, what others have attempted to find out, what methods of attack have been promising or disappointing and what problems remain to be solved.”

It is always profitable for any research programme to consult the earlier studies relevant to the present one as it promotes a greater understanding of the problem and its crucial aspects and ensures the avoidance of unnecessary duplication. It also provides comparative data on the basis of which to evaluate and interpret the significance of one’s findings. It ensures the investigator to avoid many pitfalls and contributes in broadening his vision with regard to present problems. It, therefore, appears most appropriate for the investigator to find out as to what has already been done in the filed. In the present chapter, an attempt has been made to present a brief review of those studies which have some relation with the present investigation. The studies reviewed here are directly or indirectly related to the variables of present investigation. Review of related studies has been presented under the following headings:

2.1 Spelling Acquisition in learning disabled children
2.2 Error patterns of spelling disabled children
2.3 Role of vision in learning
2.4 Role of Feed back in learning
2.5 Remedial Techniques
   2.5.1 Multisensory Techniques
   2.5.2 Other Techniques
2.1 SPELLING ACQUISITION IN LEARNING DISABLED CHILDREN

Burns and Broman (1975) suggested that 20 words per week are appropriate for adequate spellers, but only 5 to 10 words per week should be presented to poor spellers. Their spelling acquisition is slow. Torgesen (1977, 1983) contended that it is the passivity of the learning disabled children that contributed to their slow rate of acquisition of spellings.

However, spelling acquisition in learning disabled children is not merely a function of subject characteristics like cognitive and problem solving ability, family history and gender. Several situational and task variables also influence acquisition of this skill in learning disabled children.

Bryant et al. (1981) looked into the effects of varying the unit size on the spelling achievement of 43 male and 21 female learning disabled children having a mean IQ of 93.1 and a mean chronological age 122 months. The subjects were divided into three groups, which differed only in number of phonemically irregular spelling words that were taught, i.e. 3, 4 or 5 words per day over a 3 day period, using efficient instructional methods incorporating principles of mastery learning, cumulative and distributed practice and immediate corrective feedback. Results showed that overloading, higher failure rate, greater number of transpositional errors and variance in performance occur when the number of words presented each day exceeds 3. Findings support the notion that learning disabled children may be subjected to overloading if presented with more material than they are able to handle.

Carlisle (1987) found that ninth grade students with learning disabilities showed less evidence of morphological or rule based knowledge in spelling, than even normally achieving fourth graders.

Gerber (1987) attempted to explain these differences by postulating that spelling proficiency is related to the acquisition of
problem solving strategies that aid in the effective organisation of orthographic information. The learning disabled child often fails to recognize his spelling strategies, therefore, he has limited number of known spelling words and a significantly reduced chance of spontaneously mastering the complex orthographic system. They thus have a knowledge base and problem solving process, similar to younger learning-disabled children.

Bailet (1990) compared spelling performance of students with learning disability with that of same age normally achieving students and normally achieving younger students. Learning disabled students were divided into 2 groups-poor readers/good spellers and good readers/poor speller. One task of phoneme grapheme correspondence rule usage and 4 tasks of suffix rule usage were administered. Results showed that learning disabled children performed significantly below the same age normally achieving group on all tasks. Also significant differences in spelling rule usage emerged during the secondary analysis on mastering of the past tense spelling rule ‘ed’, and in some sub-skills related to the spelling of words with suffixes.

Vogel (1990) put forward normally achieving females as higher in verbal ability where as males are higher in visual spatial and mathematical ability, but learning disabled females are better in visual, motor abilities-spellings and written language mechanism than males.

2.2 ERROR PATTERNS OF SPELLING DISABLED CHILDREN

Holemes and Peper (1977) proposed in their study that the proportion of errors, of any error type is similar for both normal and learning disabled children. They differed only in the number of errors committed.

Deshler et al. (1978) worked on error monitoring in school work of learning disabled adolescent and found that students with learning disabilities introduce more spelling errors than their nondisabled peers.
and experience significant difficulty in both the detection and correction of spelling errors.

Gerber and Hall (1979) found that the errors produced by fourth and fifth grade learning disabled students with attentional problems were not deviant from younger normally achieving spellers.

Frith (1980) contended that children with spelling disability are considered to make errors because of difficulty in the selection of the appropriate spelling for a taught word from competing phonetically appropriate alternatives.

Carpenter (1983) sought to determine whether the error patterns of 30 disabled readers differed from the error patterns of 40 younger able readers and 37 able readers of the same age. Discriminant analysis indicated distinguishing patterns, primarily between the disabled readers and older able readers. The phonetic strategies seemed to constitute the major difference between the two groups and results showed that disabled readers exhibited more unrecognizable spelling while spelling words.

Henderson and Beers (1986) found the learning disabled students' errors revealed phonetic strategy, which is similar to the spelling attempts of first grade normally achieving children.

Dalton et al. (1990) in a study with two fourth grade students with learning disabilities reported that use of a word processor-based spelling checker assisted the participants in correcting as many as 80% of their spelling errors, without the spelling checker, neither of the participants had corrected more than 33% of his or her errors. Often (3 out of 6 writing samples) did not make any spelling correction at all. A similar pattern of finding was observed by Mac Arlhur, et. al (1996) for students with LD in Grade 5 through 8. The students in that study detected and corrected significantly more errors when making use of a word processor based spelling checker.
Bourass and Treiman (2001) reviewed that early spelling development is guided by linguistic factors. Fine-grained linguistic analysis of spelling errors can help one to understand the difference that may exist between normally developing children and children with spelling disabilities.

After going over the above studies it is found that the children having learning disability are not able to fully benefit from regular teaching because they lack in appropriate strategies, also the error patterns are similar to younger normally achieving spellers.

2.3 ROLE OF VISION IN LEARNING

Myklebust (1964) maintains that some children have serious difficulty when a learning task involves simultaneous processing of both visual and auditory information.

Schwalb and Blau (1968) were the first to declare that the bilateral visual process was a possible deficit among dyslexics and learning disabled individuals.

Blau and Blau (1969) reported a technique called 'modality blocking' or 'non-VAKT' for children with bizarre spelling. By 'non-VAKT', they meant literally blindfolding the child, and recommended drawing the letters of the word on the child’s back. They borrowed Fernald’s tracing technique, but used three-dimensional wooden block letters to teach the child.

This led Raskin and Baker (1975) to conclude that while research indicates that vision is the dominant and superior modality, teachers in selecting a modality or modalities as part of a teaching strategy, may find it necessary to resort to a tactual presentation with tactual recognition.

Posner et al. (1976) postulated that visual input tends to dominate other modalities in perceptual and memorial judgements.
Further experimental evidence regarding the interference effects of vision in skill learning among learning disabled students started to appear.

While working on simultaneous attention to incoming visual information and to the execution of a plan, Kelso and Frekany (1978) bring out the fact that human beings attend to the visual modality automatically. They conclude after conducting 3 experiments, that vision not only fails to improve reproduction accuracy on a previously learned task, but also appears to have a deleterious effect on preselected movements. Although subjects in their experiments were specifically informed that vision would not be available during reproduction of the task, subjects continued to attend to the visual information. They, thus, conclude that knowledge of the response modality was ineffective in reducing the detrimental effects of vision on a kinesthetic reproduction task.

Pavlidis (1981) theorized that when dyslexics read, they made more eye fixations and regressions, often fixated for longer and made less effective saccadic eye movements. Others have questioned whether these were the causal or resultant factors for their dyslexia.

Stanely et al. (1983) however, studied the efficiency of eye movements while tracing sequential lights in 15 dyslexic and 15 controlled children and found no significant differences between the two groups on two predetermined measures of efficiency.

Ormrod (1985) conducted a study to investigate the visual memory in a spelling matching task: comparison of good and poor spellers. It was investigated through a matching task on which one nonsense word was presented, then a second word identical in spelling or differing in one letter was presented. Ten pairs of 9th and 10th grade students, matched for intelligence and sex but of different spelling ability, were asked to indicate whether word pairs were spelled the same or differently. It was found that good spellers were equally good to
identify matched and mismatched pairs, while poor spellers showed greater difficulty in identifying mismatches than matches.

In light of above studies it appears that availability of visual inputs may cause variation in spelling performance. Such a question is attempted in the present study.

### 2.4 ROLE OF FEEDBACK IN LEARNING

Feedback also plays an important role in the improvement of performance of any academic subject. Feedback can be internal i.e. through our senses and external i.e. from outside-praise, reinforcement.

Guthrie (1971) tested 90 adult subjects for the learning of 39 sentences verbatim. Three levels of feedback were included. Feedback consisting of both stimulus and response, feedback consisting of only response, no feedback. Results showed that feedback facilitated learning when it followed wrong responses. It had no effect on learning already correct responses. Feedback consisting of both stimulus and response was superior to no feedback.

Savage (1978) has investigated the vital role of reading aloud which provides auditory feedback to self. This helps the child to concentrate. Also through this, the kind of errors made are found by the teacher more easily and the child can self correct his errors.

Kulhavy and Anderson (1979) believed that delayed feedback is more effective as learners forget their incorrect response over the delayed interval and then there is less interference with learning the correct association from the feedback.

Nulman and Gerber (1984) examined the performance of an 8½ years old male with a learning disability providing immediate feedback based on spelling accuracy. Across 7 trials the ability to spell 10 words correctly increased from 20% to 100%.
Elwa and Corm (1985) found that specific feedback on errors drew attention to material not adequately learned allowing students to focus there and not to be distracted by too much re-examination of work done well.

Espin and Sindelar (1988) studied the effect of auditory feedback and writing of learning disabled children. The effect of listening to and reading passages were compared with two control group, one matched on readings level one matched on chronological age. Half of the students received auditory feedback. The other simply read the passages. For all groups' students listening to the passage located significantly more errors than those reading.

Baechle and Lian (1990) investigated the effects of direct feedback and practice on metaphor performance in learning disabled children. Direct feedback and practice increased significantly metaphor performance these children. The grade and reading level of the subjects correlated with their metaphor performance.

Singh, et. al (1991) evaluated the performance of 4 high school students having learning disability across a program of direct rehearsal, directed rehearsal with task variation or no training. The authors implemented each condition for each student over three, 3 to 5 minute sessions per day. In the directed rehearsal condition, a student was required to write a word said by the teacher and if, misspelled, pronounce the word and each letter with the teacher while re-writing the word. This was repeated 5 times. In the 2nd condition, spelling words known to student were added to the list. Results showed that both treatment condition were equally superior to the no training condition in improving spelling accuracy.

Kearney and Drabman (1993) evaluated a strategy for improving spelling accuracy. The write say method provides immediate feedback to dual sensory modalities (i.e. V + A) following the administration of a daily spelling test. 4 males and 3 females (Mean age = 11.61 yrs.) with
learning disability were taken. Compared to control conditions the experimental procedure significantly enhanced subject spelling accuracy in a brief period of time.

2.5 REMEDIAL TECHNIQUES

Review of literature indicates several alternative methods to teach spelling, each a result of the psychological and educational conditions prevalent at the time of their popularity.

Many approaches have been suggested to improve spellings still it has usually been a difficult task for educators.

2.5.1 Multisensory Techniques

Programmes classification as being multisensory generally emphasizes working with academic materials directly (e.g. Fernald 1943, Gillingham & Stillman, 1965, McGinnis, 1963). As the term implies, multisensory involve the remediation of a child's problems by using a combination of the child's sensory systems in the training process. The assumption is that the child will be more likely to learn than when one of his senses is involved in the learning experiences. This approach has been used to teach reading, writing and spelling by using units of sound or letter of alphabets (Gillingham & Stillman, 1968).

Orton (1937) stressed sound symbol relationship utilizing visual, auditory, kinesthetic and tactile instructions.

Fernald (1943) proposed a VAKT instruction procedure which emphasized syllables and word parts.

Gillingham and Stillman (1965) emphasized a close association among visual, auditory and kinesthetic instruction. They employed a phonetic approach to reading and spelling.
Hallahan and Kauffman (1976) suggest that kinesthetic and tactile sensory inputs compensate for weak visual or auditory input.

Weaver and Rosner (1979) investigated the relationship between visual and auditory perceptual skills and comprehension in students with learning disability. 25 learning disabled (9-13 years) were compared on 5 tests, a visual-perception test (CPM), auditory-perception, a listening and reading comprehension test, and a word recognition test. A correlation coefficient indicated high significant relation between visual perception and listening comprehension and between visual perceptual skills and reading comprehension, auditory perception was related to listening comprehension.

Bloom (1981) found that the time on task is one of the most important variables in predicting subsequent learning. Multisensory instruction for learning disabled children is beneficial because they develop the ability to attend more slowly than others and instructions from all modalities will help them concentrate.

Blau and Loveless (1982) proposed a temporary cut off of the use of visual modality by blind folding and then the development of a brain strategy based on scanning the letters of unknown words with the finger. The subjects were supposed to use finger of one hand only. Results showed improvement in immediate but not in delayed recall.

Curley and Reilly (1983) in their study investigated whether there would be an increase in the level of learning spellings and efficiency in the student if they were taught through their dominant perceptual modality. A group of 20 each was made depending on how they performed on 2 perceptual procedures. During instruction, the spelling task to be mastered was given under the following three sensory modalities, auditory-vocal-motor, a visual vocal motor and combination channel. Results showed that improvement was seen only in visual combined conditions.
Thorpe and Borden (1985) investigated the effect of multisensory instruction on the word reading accuracy and on task behaviour of seven, eight and nine year old learning disabled students in a series of 4 experiments, visual and auditory instruction with or without teacher praise. Results showed that VAKT with and without praise and VA with praise brought a significant improvement.

Gerber (1986) worked on generalization of spelling strategies by LD students as a result of contingent imitation modeling and mastery criteria. 11 learning disabled elementary students were asked to attempt spellings of unknown words using a standard written dictation test. An imitation modeling procedure to provide corrective feedback but minimal instruction dictations were repeated until 100% accuracy was achieved. A second list of words showing the same orthographic features was then administered without specific instructions to use information about previous spellings in attempting words on the new list.

Results showed that all but one student reached mastery in fewer than 10 trials. Subjects obtained more correct spellings on the first trial of each new list, subjects required fewer trials on each successive list to reach criterion, and subjects demonstrated systematic improvements in quality of spelling attempts across both trials and tests.

Graham and Freeman (1986) taught children with learning disabilities a five step strategy to study spelling words during one 20-minute training session, subjects were required to say a word, write and say the word, check the word, trace and say the word and write the word from memory. Control subjects were instructed to study words using any strategy they wished. Following 30 minutes of study, experimental subjects scored significantly higher than control subjects on spelling accuracy. The authors concluded that "adult imposed" word study strategies for spelling were effective for this population, although questions concerning generalizability (e.g., to other classroom settings)
and efficacy for delayed recall of words (i.e. longer than several times) were not considered.

Larsen and Hammill (1986) test of written spellings (TWS) was used to study spelling performance of those students who were getting alphabetic phonic multisensory instructions. The sample used to norm the TWS-2 consisted of 3805 students, six to eighteen years old. Total TWS-2 post test scores were significantly higher than pretest level for the total group (t = 9.00, P < .001) and all subgroups. The greatest change was found among elementary students (pretest = 74.9, post test = 79.5).

An experimental project employed the multisensory teaching approach for reading, spelling and handwriting (MTARSH) programme for four years beginning in 1977 to 1981. The baseline measures for Grade-III were 299.08 and mean scores after one, two or three years of instruction by MTARSH programme were 314.17, 312.65 and 316.39 respectively, F (3,80) = 9.88, P < .0001. The means of Grade-IV ranged from a baseline of 325.73 to 352.29, F (3, 91) = 1.62 P > .05. The baseline mean score for Grade-V was 351.88 and mean scores were 344.33, 383.88 and 398.33 after one, two and three years of instruction by MTRASH programme respectively F(3, 90) = 4.446, P < .0006. The base line mean scores of Grade-VI was 378.64 and mean scores after one, two, three and four years instruction by the MTRASH programme were 398.77, 380.29, 382.32 and 415.25 respectively, F(4,65) = 1.30, P > .05 (Karen, et al., 1987). There is also evidence that once students learn the structure of English, spelling and use this structure to analyse unfamiliar words, both reading and spelling improves.

Hill (1988) in his study taught the spellings by (a) Visual (b) Auditory (c) Tactual/kinesthetic methods which were multisensory in nature. The findings of the study indicate that learning disabled students can express reliable modality preference and get benefit from a diagnostic prescriptive process that systematically considers both
modality preferences and various instructional methods. Further, no single method is consistently more effective for learning disabled students when modality preferences are not concerned.

Tezler (1993), aimed to compare the effectiveness of three types of modeling (i.e. copying, mastery and no modeling) and two types of strategy attribution (i.e. with attributional experiences and without attributional experiences) on students’ use of self-regulated learning process (self-efficacy and self evaluation) and spelling achievement. Using model of self regulated learning as a framework for the investigation, 50 sixth and seventh grade students who had been identified as having difficulty in learning how to spell served as subjects. The subjects were randomly assigned to one of five treatment groups according to a 2 (copying vs. mastery modeling) x 2 (attribution vs no attribution) design. A control group formed the fifth group. The study involved four phases: training phase, a pre test phase, a learning phase and a post-learning phase. During the training phase subjects in the treatment group observed a video-tape of a peer model demonstrating a strategy for learning how to spell. The pre test phase comprised of subjects’ rating their self-efficacy for spelling and taking a spelling pre test. During the learning phase subjects practiced the observed strategy. The post test phase consisted of a spelling post test and subjects’ self-evaluative judgment. The dependent measures were: self-efficacy for spelling, spelling pre test, self efficacy for learning, spelling post test and self evaluation for spelling. Results of the study showed that for two of the dependent measures, post test and self-evaluation, modeling and type of modeling (i.e. coping) each affected student spelling performance and level of self efficacy. Attribution training did not significantly affect spelling performance or self efficacy. An additional finding was that observing a coping model using a strategy with attribution had a significant effect on post test spelling performance and self evaluative judgement. Contrary to expectations, there were no significant interaction between types of modeling and use of strategy attribution.
Dalvi (1994) studied the effectiveness of write-say method in teaching spelling to phonetic and non-phonetic spellers having spelling disability. She reported that there was no significant difference in the spelling performance of the two groups of spelling disabled children in spelling task. She reported that corrective feedback helps the learning disabled children to perform better with self-correction and to have independent learning.

Wilson (1994) studied the efficacy of the sensory integration (SI) treatment compared with tutoring on learning disabled children. The gross motor performance of the group who received SI treatment was significantly greater than that of students who received tutoring. However, there was no difference between the groups on measure of reading skills, fine motor skills, visual motor skills, or behaviour factors.

Mauer and Kamhi (1996) examined (a) relative impact visual and phonetic factors have on learning phoneme-grapheme correspondence and (b) the relationship between measures of visual and phonological processing and children's ability to learn novel phoneme-grapheme correspondence pairs. The children ranged in age from 5 years 2 months to 9 years 3 months. All children completed a phoneme-grapheme learning task consisting of four novel correspondence pairs, a visual processing and five measures of phonological processing. Performance of learning task was significantly correlated to performance on the visual processing task and five measures of phonological processing. Performance on the phonological processing task of short-term memory was the best predictor of overall performance on this learning task.

Mac Arthur, et al. (1996) conducted a study entitled “spelling checkers and students with learning disabilities: performance comparisons and impact on spelling”. They found substantial differences in error detection and correction performance among word processing packages, especially with respect to more severe spelling
errors. Accuracy disabled (dysphonetic spellers) and rate disabled (dyseidetic spellers) subtypes were given one of three treatments by Lovett et al. (1984). The decoding skills (DS) program focused on word recognition and spelling skills using a phonics approach for regular words and sight vocabulary approach for irregular ones. The oral and written language stimulation (OWLS) program involved intensive work an oral language comprehension, reading comprehension and written composition. The classroom survival skills (CSS) program was a control procedure involving social skills, classroom etiquette, life skills, and self help techniques. Accuracy disabled children improved their decoding of both regular and irregular words through the DS (decoding skills).

Khanna (1999) examined the effect of multisensory instructional and play way approaches towards the remediation of spelling in science of the elementary learning disabled children in relation to their anxiety, self concept and locus of control she found that (a) multisensory instructional and play way approaches were useful devices to remediate spellings of learning disabled children (b) this experimental treatment has long term effect on the achievement (c) and also confirmed that anxiety and locus of control were negatively related with achievement, where as self concept and intelligence were positively related with achievement.

Bólich and McLaughlin (2001) reviewed and examined the use of mnemonic strategies as an instructional procedure to assist children with learning disabilities. The available literature indicated that teachers who employ such strategies assist their students on a variety of academic measures.

Gupta and Pavri (2000) studied the effectiveness of TAK/v and VAKT approach in teaching spelling to spelling disabled children they found that there was significant difference in the spelling performance of spelling disabled children in favor of TAK/v approach, under the delayed recall condition and found insignificant differences when taught under the immediate recall of post test conditions.
Falk, et al. (2003) the purpose of their study was to improve students’ sight word vocabulary through the use of reading racetracks and flashcards. The participants were three nine-year old males diagnosed with a learning disability. The research was carried out in resource room of an elementary school in Northwest. The outcome measured was member of correct words and errors said per minute from flashcard directly after completing a reading racetrack. The reading racetrack procedure was evaluated in an ABAB single case design. The result indicated that reading racetracks was effective in increasing children’s sight word vocabulary.

2.5 OTHER TECHNIQUES FOR REMEDIATION

Hildreth (1955) noted that the traditional method of teaching spelling i.e. emphasis on rote memory through repetitive oral spelling and the copying and studying of spelling list was most effective from among many techniques.

Hallenback (1975) has given the ideas for the use of comic strips in remediation work with learning disabled children. It is stated that comics are especially good for developing conceptual and logical abilities (e.g. sequencing, abstract thinking of class inclusion) and were found to be excellent for dyslexic children to give practice in reading.

Goyen and Martin (1977) suggested that spelling instructions in the secondary stage should be concerned more with infrequent words than with grapheme-phoneme correspondence. Since spelling is predominantly a verbal intellectual task, it would be seen that infrequent words would be easier to spell if they were made more familiar and more meaningful. It is suggested, therefore, that spelling instruction should form an integral part of vocabulary training. The importance of morphemic elements in English orthography should not be ignored.

Kauffman, et al. (1978) found that imitating student’s error before presenting a correct model was superior to the traditional approach.
This was especially the case for words which did not follow regular phonetic rules.

Kovitz (1979) demonstrated that when an oral imitation of child's misspelled word precedes the correct model of a word, better performance is seen. The objective of error scanning is to heighten the child's recognition of errors by contrasting erroneous and correct production. There are three phases-interpersonal scanning, intrapersonal scanning, and correction scanning.

As the child becomes aware of the spelling difficulties, a combination with the positive feedback of error recognition and the positive self-corrective experience helps in facilitating correct spelling behaviour.

Smith (1979) investigated the improvement in child's oral reading through teacher modeling. Three learning disabled students participated and the result showed that modeling plus error correction improves the performance of the children.

Ollendick et al. (1980) conducted a study entitled "increasing spelling achievement: an analysis of treatment procedures utilizing an alternating treatment design". Two studies which examine the effectiveness of spelling remediation procedures were reported. Results of both studies indicated that the combined positive practice plus positive reinforcement procedure was more efficient and that it was preferred by the children. Following brief training under this combined procedure all children demonstrated 100% spelling accuracy.

Bryant, et. al (1981) investigated the degree to which varying the number of spelling words taught relates the percentages of words spelled correctly by learning disabled children. 64 children were divided into three treatment groups that differed only in the number of phonemically irregular spelling words taught (3, 4 or 5 per day) across three days of instruction. Results showed that even with efficient instruction procedure, over loading; higher failure rate and percentage
of transposition spelling errors and greater variance in performance may occur when the no. of words presented exceeds three.

Graham (1983) worked on effective spelling instruction and he suggested that elementary teachers should carefully evaluate both their own instructional practices and spelling materials with considerable practice developing specific skills (with an effective spelling program).

Lovett et al. (1987) worked on training the word recognition skill of dyslexic children and investigated treatment and transfer effects. They have found transfer effects in a word recognition training programme for accuracy-disabled readers (dysphonetics).

Clarke (1988) has documented how first grade students who were encouraged to use invented spellings in their writing showed both increased independence in writing and greater skill in spelling compared to students who were encouraged to spell correctly.

Reynolds et al. (1988) investigated the effect of instruction in two-revision strategy on the paragraph writing of students with learning disabilities in grades 6 through 8. The two experimental groups both received instruction in one strategy for revision of mechanics and one for content, but order of instruction varied. Results suggested that revision instruction for both experimental groups improved scores on an analytic scale for mechanics regardless of order of instruction.

Ormrod and Jenkins (1989) worked on “strategies for learning spelling: correlation with achievement and developmental changes”. They have observed over pronunciation as an effective strategy which was more frequently observed for older students.

Outhred (1989) has described the effects of using a word processor on creative writing of a small group of children with learning disabilities. He found that the children with severe spelling problems using a word processor seemed to result in fewer spelling errors, while for the children who were still predominately concerned with the
mechanics of writing task, using a word processor seemed to result in longer stories.

Loomer and Fitzsimmons (1989) studied spelling performance and practice, and cited self correction as the best learning activity for teaching spelling to all students.

Baker et al. (1990) studied the effectiveness of small group versus one-to-one remedial instruction for six students with learning difficulties. It was found that one to one instruction was helpful approach in a remedial setting (in both spelling and fractions).

Block and Peskowitz (1990) conducted a study on “metacognition in spelling: using writing and reading to self check spellings” Forty students aged 9-11 predicted their spelling performance using a 3 point scale (yes, I can; may be I can; no I can’t spell it), before spelling 18 medium difficulty words. Half an hour later students looked at each word and judged its relative correctness on the 3 point scale they used to make predictions (yes, it is; may be, it is; no, it is not correct). In the second phase of study 3 experimental groups “looked” at their spelling under different conditions: silent pronunciation, loud pronunciation by student or teacher pronunciation. A control group simply predicted and wrote again. They found that students’ predictions were significantly correlated with their actual spelling accuracy.

Diveta and Speece (1990) worked on the effect of blending and spelling training on the decoding skills of two first grade boys with learning disabilities who were in phonetic cue stage of reading. Both of them received pre and post test administrations of a phonemic segmentation task. Although neither intervention proved superior but they improved their phonemic skills even when independent training in this area was not provided.

Mastropieri, et al. (1990) compared the effects of a keyword mnemonic condition to a direct instruction rehearsal condition on the ability of 25 students with learning disabilities to recall and
comprehend 16 abstract and concrete vocabulary terms. The subjects were 17 boys and 8 girls of normal intelligence in the sixth, seventh and eighth grades. The result of this study showed students in the keyword mnemonic condition exhibited higher level of both recall and comprehension than the students in the direct instruction rehearsal condition across both concrete and abstract words. A main effect was also found on the production test for concrete words.

Blandford (1991) examined the effect of self-instructional spelling proofreading strategy on percentage of identified misspelling words of four learning disabled students. Results of the study were ambiguous with only participants clearly showing increase in accurately identifying misspelling at the onset of intervention. An encouraging finding of the study was that the students thought that strategy was “fun” to use and that it helped them spell better.

Byrne and Fielding-Barnesley (1991) found that phonemic awareness training improves children’s ability to decode unfamiliar words. They concluded that phonological awareness and letter knowledge is necessary, but not sufficient for the acquisition of the alphabetic principles.

Dixon (1991) conducted a study on the application of sameness analysis to spellings. Three curricular approaches to spelling instruction were discussed (1) whole word (2) phonemic and (3) morphemic sameness analysis was used to indicate the theoretical potential of each approach for helping students with learning disabilities to achieve generalization in their spelling. The influence of generalization strategies upon retention and transfer was also discussed. Study indicted that meaningfulness seemed to contribute to retention and that generalization strategies are more meaningful than memorisation strategies. Furthermore, the author indicated that the successful acquisition of strategic spelling skill was at the very least a crucial prerequisite for transference. However, classrooms with more
letter-sound instruction improved at a faster rate in correct spelling and reading.

Reid (1991) compared the effects of two types of self-monitoring on attentional, metacognitive and academic performance outcome variables. 28 learning disabled students were taught a spelling study procedure (SSP) followed by self monitoring of performance (SMP) and self monitoring of attention (SMA) training. Students practiced a spelling task for one week in each condition. Results showed that one task was significantly higher in both SMA and SMP condition.

Cornwell (1992) studied the relationship of phonological awareness, rapid naming, and verbal memory to severe reading and spelling disability in 54 children with severe reading disabilities (48 boys and 6 girls; Mean age = 9 years, 7 months). They found that several independent processes interact to determine extent and severity of reading problems.

Gorden et al. (1993) summarized 17 spelling intervention strategies for students with learning disabilities and provide implication for improving spelling instructions. The following spelling intervention were determined to be effective, the use of error imitation and modeling procedure, learning 3 word a day as approach to a long word list and use of computer assisted instructions, peer tutoring and instructional techniques.

Lowe (1993) from his study concluded that constant time delay procedure implemented by peer tutors to teach spellings to learning disabled college students was effective, and helped to improve their spelling performance.

McNaughton and Twney (1993) employed an alternating treatment design to investigate the effects of two instructional techniques on the acquisition and retention of spelling vocabulary by two adults who used a augmentative and alternative communication: (a) the copy write compare method (CWC) and (b) the students directed
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cueing method (SDC). SDC differs from the CWC in that it directs the subject to attend to differences between the subject's incorrectly spelled version of word and correct spelling. The results indicated that the subjects improved their spelling performance using both instructional techniques. Post test scores revealed a retention advantage for the SDC method of instruction for both subjects.

McNaughton, et al. (1994) reviewed 27 studies (1978-94) on spelling instructions for students with learning disabilities. Most of the studies investigated the impact of instructional activities on the production of the targeted spelling items by elementary grade students with learning disabilities and stated that learning outcomes for students with LD should produce accurate spelling for a core vocabulary of commonly used words across writing activities and time. They also found that about fifteen to twenty minutes per day is enough time for students with LD to spend on spelling.

Green (1995) while conducting a study on spelling test for teachers of students with learning disabilities found that imitation and modeling students spelling errors followed by writing the word correctly, is an effective way for teachers to provide feedback to the students with learning disabilities. He emphasized the importance of the most effective and empirically validated instructional techniques in order to maximize student learning, time and effort.

McNaughton, et al. (1997) studied the effect of five proofreading condition on spelling performance of 12 college students with learning disabilities on a composition activity. The proofreading conditions investigated were handwriting with no additional assistance, handwriting with a conventional print dictionary, handwriting with a handled spelling checker, word processing with no additional assistance, and word processing with an integrated spelling checker. Except for handwriting alone, all of the techniques resulted in significant reductions in the number of spelling errors in the students' 'written work'. However, none of the techniques enabled the students to
produce compositions with a mean level of spelling accuracy comparable to that of their nondisabled peers.

Bruck, et al. (1998) compared the spelling skills of third grade children receiving either whole language or phonics instruction. The phonic children produced more positionally constrained spelling (e.g. spelling the nonword soice as “soice” or soyce as opposed to sois) than the whole language children. They suggested that positional constraints must be fundamental component of the English spelling system.

Smith (1998) tested the spelling by phono-grapheme analysis. Three out of four experiments were conducted to investigate whether teaching beginners to spell by phono-grapheme analysis has greater benefits for spelling and reading than teaching beginners to spell by letter name memorization. An additional experiment was conducted to compare spelling by phono-grapheme analysis with instruction by onset/rime analysis. In all four of the experiments, the words presented for instruction contained cluster and diagraph units. Results indicated that in general, children taught to spell by phono-grapheme analysis learned to spell and recognise the training words more efficiently than children taught by other methods. When compared with the onset/rime analysis method, there was no evidence of significant gains in nonword reading measures for children taught to spell by phono-grapheme analysis. When compared with letter name memorization, subjects trained by phono-grapheme analysis were generally better on post test measures of nonword reading, real word reading, and word in sentence reading. Findings suggested that relative to the letter name group, subjects had made progress with phoneme awareness and phonemic segmentation.

A guide to use the ICT (information and communication technology) written by Keats (2000), gives practical advice to teachers and suggests that ICT not only increases the performance of dyslexic pupils but their self confidence and self esteem as well. The spell
checker function can also help the pupils to learn spellings and gain confidence in their work.

Davis (2000) worked on rime-based analogy training on word reading and spelling of first-grade children with good and poor phonological awareness. The study had three goals: to determine whether children with good and poor phonological awareness differed on reading measures taken during rime based analogy treatment, to determine the extent to which rime based analogy treatment mediated by spelling or reading differentially affected children's ability to read and spell words without cue words and to determine the extent to which pre-treatment phonological awareness, reading and spelling skill contributed to growth on post-treatment reading and spelling measures. Children were given four days treatment during which they were taught to read or spell words based on pronunciation and spellings of cue words with four rime patterns. Children's were given experimental reading measures during treatment as well as pre and post treatment reading and spelling measures. These measures were comprised of words and nonwords with the same rimes. The results showed that children with good and poor phonological awareness made significant gains during the four days of treatment. By the third day of treatment, children with good and poor phonological awareness in both treatment groups did not differ significantly on measures of onset, rime and whole word reading. Phonological groups differed significantly on post treatment measures, but showed significant growth documenting that children with good and poor phonological awareness transferred what they learned during treatment of post-treatment reading and spelling measures.

The spelling treatment had a particularly significant effect on children with poor phonological awareness; furthermore, learning to spell with four rime patterns depended more on basic reading and spelling abilities than learning to read such words. These results
support the idea that rime based analogy training is an effective tool for teaching first graders to read and spell words.

Luzzatti et. al (2000) described the rehabilitation of spelling along the sub-word level routine. Particular emphasis was given to the treatment of the unit that allows the phonological analysis of auditory string to be written. After treatment the spelling ability of the two subjects was restored to practically normal levels on most subsets of items. Both subjects were able to apply the restored skills to spontaneous writing and to written naming tasks.

Sharon and O’ Conner (2000) compared the effects of 2 phonological training procedures segmenting and blending, or first sound identification and spelling skills among kindergartens. They were assigned randomly to 1 to 2 strategy groups. Children received 20-30 min of instruction in small groups. They improved significantly in the target skills and in reading and spelling. No significant differences were found between groups on skill acquisition, transfer to untaught skill, or generalization to reading and spelling.

Cates (2001) examined the differential effects of three methods of presenting spelling words to students experiencing difficulty in spelling. The objective of this study was to compare three academic interventions, (a) traditional drill and practice (six words to be learned) (b) Interspersing (six words to be learned plus a previously learned word presented every third word and (c) high-p sequencing (six words to be learned plus three previously learned words presented before each word to be learned).

The results of this study suggested that all three lists were equally effective but the traditional drill and interspersing methods were more efficient.

Ekrem (2001) examined the effects of active meaningful and explicit spelling instruction on students in a 1st grade classroom. Documentation was gathered through the administration of spelling
Review of Related Literature

test, anecdotal file notes, and classroom artifacts. The results indicated the implementation of effective instruction, the first grade students made significant growth in the developmental process of spelling. In addition, their motivation to write increased markedly, as did their self-esteem.

Nielsen (2001) investigated the effects of traditional versus extended word spelling instruction for third grade within word spellers on spelling achievement, metacognition, and parent/student perception on spelling. Results indicated over the course of the school year extended word study spelling instruction was significantly superior to traditional spelling instruction in students’ overall orthographic development and ability to metacognitively discuss common spelling usage patterns. Also there was no difference between the two treatments in parents'/student's spelling perception.

Owens (2001) investigated the effectiveness of spelling mastery programme on the spelling performance of elementary students with learning disabilities. He observed that students with learning disabilities made significant gains while using the spell mastery program on the number of spelling word correctly spelled as well as the percentage of correct letter sequences as measured by the curriculum based measurement.

Beeson (2002) designed a study to examine treatment protocols intended to rebuild single word vocabulary for written communication. Writing treatment were implemented with four individuals who had significant aphasia and severe dysgraphia. Two participants received Anagram and Copy Treatment (ACT) which involved arrangement of component letters and repeated copying of target words, along with a home work programme called copying and recall of target words. The other two participants received the homework-based (CART only. Single subject multiple-baseline designs were used with sets of words sequentially targeted for treatments All four participants responded positively to treatment indicating that single word writing abilities may
improve with treatment despite long times post onset and persistent requirements to spoken language.

Brundson et. al (2002) evaluated a lexical treatment programme that has been used successfully in cases of adult acquired surface dyslexia in the context of severe mixed developmental dyslexia. The results indicated a significant treatment effect that is stable over time and that generalises to unread words, to spelling, and to some aspects of sub-lexical processing.

Dagdag, et al. (2002) made a comparison of sound out procedure on all words in a word list with or without error drill was used to examine the effects on the spelling of a third grade student. Two interventions were evaluated using an ABC design. The result indicated that both procedures were successful in increasing corrects and decreasing errors in spelling and showed statistically significant differences. Follow up statistical tests found a significant differences favouring error drill for both corrects and errors.

Exley (2003) worked on the effectiveness of teaching strategies of students with dyslexia based on their preferred learning styles. She worked with sample of seven students, four boys and three girls, in years 7 and 8, using both quantitative and qualitative methods. She indicated that five of the seven students made significant progress in both spelling and number work. All students reported improved feelings about and attitude towards their school work.

Tijms et. al (2003) evaluated short term and long term effects of treatment for dyslexia. The treatment was computer based and focusing on learning to recognize and to make use of the phonological and morphological structure of words. The results of the treatment were clear improvements in reading words, reading text and spelling. Following the treatment, participants attained an average level of text-reading and spelling. The attained level of reading words and reading text was found to be stable over a four-year follow up period.
Spelling showed a slight decline one year after the treatment, but remained stable thereafter.

Fitzpatrick, et al. (2004) examined the effects of one and two day reads over lessons in a reading master. The participant was a fifth grade male with learning disability. Data were collected on his corrects and errors rate across various lessons. The result indicated a sharp decrease in errors with a smaller increase in corrects.

On the basis of above studies the researcher arrived at the hypotheses given in chapter I.