CHAPTER 2
REVIEW OF LITERATURE

Following the conceptualisation of the study, focus of the present chapter will be on research on LD and language. A detailed review of related literature has been presented which consist of important components of intervention programmes and how it impacts effectiveness and outcome of intervention. The chapter ends by summarising the review and identifying gaps in existing literature which paved the way of the present study.

Learning Disability: Language Basis

Mastery over the language used as a medium of instruction for teaching-learning is a great predictor of academic outcomes. Children with learning disability exhibit a poor connection between language and learning; consequently they show poor academic performance. Incidences have been found that children, who show poor language proficiency (like, fluency and articulation disorders) in their early years of schooling, are likely to develop symptoms of learning disability later on (Karanth, 2003, 2008). Therefore, it may be concluded that intervention addressing this aspect would directly enhance school based learning. Further, reading is a skill that directly contributes to school success. Hence, research needs to address language-reading aspects in the context where children are learning to read.

Initially, most of the studies in the field of learning disability were carried out in English language and it was assumed that their findings could be generalised to other languages as well because reading and its underlying cognitive processes are similar across the languages. However, this focus shifted to the specific nature of language and investigations were done in many languages other than English; for instance, German, Chinese, Japanese, Spanish and so on. These researches give evidence that learning disability has a language barrier. Furthermore, it exists in people from all ethnic groups and socio-economic levels (Narayana, and Xiong, 2003).
The nature of orthography also influences the spelling of LD children. However, it is possible that the same child can face reading difficulties in one language and can be good in other language at the same time (http://www.guardian.co.uk/education/2004/sep/23/research.highereducation2). It is also true that the manifestation of reading problems varies across languages, and the nature of difficulties differs in different orthography; for instance, in English language, it is considered as a "phonological disorder". However, this condition is described as causing trouble in detecting or manipulating the sound structure of oral language, that further leads to problems in mapping speech sounds onto letters. On the contrary, in Chinese language, which has a different orthographic system, reading disability refers to a visuospatial deficit as well as a phonological disorder (http://www.sciencedaily.com/release2009/10/091012121333.htm). This is because the orthographic pattern and nature of a language varies from one language to the other. Little variation in orthographic transparency can change the structural design of the reading system and also the nature of reading difficulties faced by children. It has also been found that children’s reading speed is affected by frequency, orthographic neighbourhood size and word length (Davies, Cuetos, and Glez-Seijas, 2007). Thus, reading development in a transparent language like, Spanish is delayed rather than deviant. At an early age, reading development is characterised by reading speed; however, later, it is influenced by specific knowledge about words [ibid].

The orthographic system of languages is characterised as deep/opaque (where connection between sounds and letters is complex) and transparent/shallow (where grapheme–phoneme correspondence is one-to-one) (Sebba, 2007: 19), influences children’s reading. For instance, English is considered as an opaque orthography, whereas Hindi falls on the continuum of transparent orthography. The use of strategy in reading acquisition varies from one language to another; children’s use of reading strategies depends on the nature of that orthography (Karanth, Mathew and Kurien, 2004). It has been found in researches that children’s reading of transparent orthography is strongly based on grapheme–phoneme correspondence (GPC rule), whereas
their reading of opaque language is not very strongly influenced by it (Widjaja and Winskel, 2004). Baluch and Danaye–Tousi (2006) mentioned that reading as a complete word as well as recall is easier in transparent orthography than opaque. It’s not just that reading of word/words vary in relation to the nature of orthography, whereas it also influences the reading of non-words (Seymour, Aro and Erskine, 2003).

Apart from the orthography, the phonological system of a language also influences children’s reading acquisition. The rate and pattern with which phonological awareness of children develops is influenced by phonological and orthography system (Ho and Bryant, 1997). Evidence from cross-linguistic studies shows that reading of words and non-words differ in transparent and opaque orthography; for instance, in opaque orthography (like English), children take more time in mastering basic skills required for reading in comparison to transparent orthography (like Italian, Spanish or German) (Seymour, Aro and Erskine, 2003). Reading is influenced by the nature and complexity of the spoken language which also states the most significant characteristics of dyslexia. The representation of written language influences the development of reading and spelling and the difficulties faced by children with reading disabilities (Youman, 2012). The nature of orthography has been mainly characterised into three types: alphabetic (each symbol represents a correspondence sound, like Roman script), logographic (symbol or combinations of symbols signify whole words, like Chinese) and syllabic (each symbol denotes a syllable). The example of syllabic orthography are Japanese, Korean, Cherokee and Hindi (McDougall, Brunswick and Davies, 2010: 9; Youman, 2012).

Apart from syllabic features, Hindi orthography also shares characteristics of alphabetic orthography, which is its unique quality. The syllabic nature of orthography was conceived in 1821 by Sequoyah, half-Cherokee Indian. It is one of the most famous American Indian writing systems, which is very simple and can be learnt easily. The basic feature of this orthography is that
“concepts are represented by a series of prefixes and suffixes added to an original stem word” (McDougall, Brunswick and Davies, 2010: 9).

Before planning for the intervention, it is important to understand the nature and features of orthography. It is well known that LD is a result of neurological impairment, yet its manifestation is influenced by nature and characteristics of orthographic system. It is clear that while the neurological functioning of the brain would not be affected by cultural background, however the same does not apply for language. Each language presents unique features that pose different challenges for struggling readers. Youman (2012: 224) says, “this changes how dyslexia affects individuals who come from different language backgrounds”. The following section deals with nature of Hindi orthography which is the main focus of the primary study.

**Description of Hindi Orthography:** India is considered as a multilingual nation. Article 34(1) of Indian constitution recognises Hindi as the National Language. Hindi is spoken by a majority of Indians and people across the world. It is mainly spoken as the first language in Uttar Pradesh, Madhya Pradesh and Bihar and as a second language in many other states of North India. It is recognised as an official language in many Indian states and union territories, such as, Uttar Pradesh, Madhya Pradesh, Bihar, Haryana, Rajasthan, Himachal Pradesh and Delhi. It is rooted in the Indo–Aryan family of languages, which belongs to the Indo–European family. Therefore, it shares some commonality with many European languages, like English, French, German and Russian.

Hindi language is spoken in many dialects in different parts of the country. It has been mainly divided into western and eastern groups. For instance, spoken dialects in eastern region of country are *Braj* (western U.P. and neighbouring districts of Haryana, Rajasthan, and Madhya Pradesh), *Bundeli* (north-central Madhya Pradesh and south-western Uttar Pradesh), *Bangru* (Haryana), and *Hindustani*. Western region dialects are *Avadhi* (north-central and central Uttar Pradesh), *Naghel* (north-central Madhya Pradesh and south-central Uttar Pradesh), and *Chattisgarhi* (east-central Madhya Pradesh)
Hindi is based on Devanagari Script (sometimes referred to as the nagari writing system) (Bright, 1996). It is considered syllabic in nature, wherein each figure or letter represents an independent syllable, which is modified syllabary.

It also shares properties of alphabetic orthography. For example, the letter क = (क + अ) has a hidden vowel in it and it is an independent alphabet in itself because of independent phonology. It is written from left to write and characters of this language are hung from a horizontal cross. It exhibits a direct relationship between sounds and letters. It consists of 33 consonants which can be divided into groups on the basis of the phonetic properties of their formation. These groups contain 20 stops (क, ख, ग, घ, च, छ, ज, झ, ट, ठ, ड/ड़, ढ/ढ़, त, थ, द, ध, प, फ/फ़, ब, भ) five nasals (ड, ढ, ण, न, म), four semi-vowels (य, र, ल, व), three sibilants (श, ष, स), one “h-like” sound or glottal (ह), and two flaps (र, रह/ऋ). In Hindi language, there are 11 vowels (अ, आ, इ, ई, उ, ऊ, ऋ, ए, ऐ, ओ, औ). Vowel has two forms of representations; first, as an independent character when vowel is used as an entire syllable (as in word initial positions) and second, as matra, when a vowel is preceded by a consonant or a cluster of consonants [ibid]. The second representation of vowel, i.e., matra is written in the form of lines, hooks, or combination of both placed above, below or to the side of a consonant. It also consists of nasalised vowels; for example, (anusvara) (◌) or anunasika or chandrabindu (◌◌) (Shapiro, 1989:12).

Many Hindi speakers employ several other sounds that are not part of the indigenous inventory of consonants. These supplemental consonants have come into Hindi because of the borrowing of vocabulary from non-Indo-Aryan languages (e.g., Persian, Arabic and English). The source language possesses consonants which are not characteristic of native Hindi. When the vocabulary items were adopted, some resemblance of the pronunciation of the sounds in
the language of origin was also adopted (for example, क and क, ख and ख, ग and ग, ज and ज, झ and झ, फ and फ, ढ and ढ, घ and घ). These consonants with dots below them were not the part of original Devanagri orthography. They have been borrowed from other languages.

Studies on Indian languages have been limited; however, there has been a few comparative studies on Hindi. Gupta (2004) examined the nature of reading difficulties faced by reading disabled children in Hindi language in reading single word and non-word items with different length. She found major difficulties in the area of reading speed and accuracy. Children took more time to respond and committed more errors with increase length and complexity of the stimuli. Children showed more grapheme errors in comparison to phonological errors. These errors were further characterised as vowel substitution or deletion and consonants. Errors related to the use of vowels were more frequent than the use of consonants. In spite of the transparent nature of Hindi orthography, children were found to have a difficulty in mastering phonological depiction of words and exhibited weak blending skills. Reading of three and four syllable words by children was done by focusing on the individual letters, which showed weak blending skills at phonemic or syllabic level, a major indicator of both, poor grapheme-phoneme correspondence and impaired lexical access.

Types of errors committed by children with reading disability are indicative of reading skills used by them. In this regard, a study by Gupta and Jamal (2006) analysed the types of errors committed by Hindi-English bilingual reading disabled children in Hindi and English languages. They reported high occurrence of phonological errors in Hindi (60%) and English (57%). The larger number of phonological errors in a language like Hindi, which shares a consistent letter-sound features, shows that dyslexic children find it hard to master phonological skills. Other errors were orthographic, i.e., 15% and 35%, mixed errors 25% and 7% and unrelated errors 0.38% and 0.94% in Hindi and English, respectively. Another trend that was noticed in their errors in Hindi
language was a high rate of non-word errors (89%) than real word errors (11%), whereas in English non-word and real word errors were nearly equally frequent (54% and 46%, respectively). The high occurrence of non-word errors in Hindi shows that children used grapheme-phoneme correspondence to read words, which is an important skill to be learnt for Hindi readers. On the contrary, in English, children apparently tried to employ direct access strategies to read words which resulted in high rate of real word errors. It can thus be concluded that errors committed by reading disabled readers vary in different orthographies.

Researches in Kannada language (which shares orthographic features with Hindi, i.e. it is an alphasyllabary) found that more time is required to master akshara knowledge than phonemic awareness (Nag, 2007). However, in a recent study by Nag and Snowling (2011), phonological awareness of Kannada language was found to be associated with orthographic knowledge. For example, children who were poor in orthographic knowledge showed poor phonological knowledge as well, and vice versa. They also reported that “orthographic knowledge, phonemic awareness, and RAN were independent predictors of reading rate and, together with syllabic awareness, predicted individual differences in reading accuracy” (Nag and Snowling, 2011). They suggested that “increasing alphasyllabic literacy promotes a dual representation at the syllable and phoneme level and that the analytic processes involved in acquiring orthographic knowledge and mapping with phonology are a universal aspect of reading development across languages” [ibid].

A study conducted in Oriya language on children from primary schools by Fukuzawa and Prakash (1993) suggested that instructional process differs in different orthographies. They also found that “oral reading performance and reading comprehension did not develop simultaneously, though they were positively related to each other in all the grades. The children, in their literacy acquisition process, seemed to follow two successive stages: phonemic (syllabic) decoding alone and phonemic decoding plus comprehension, which are otherwise not considered as two distinct stages of the acquisition process”
Children’s rapid reading in Kannada is influenced by syllable length and complexity of words rather than types of words, i.e., concrete and abstract and how frequently a word is occurring (Karanth, 2002; Karanth, Mathew and Kurien, 2004).

The awareness about problems of children with LD in our country has been increasing. However, intervention based studies have not been focused upon as much as required, especially in Hindi language. Most of the interventions are given on a one-to-one basis, in small groups and, very few studies are addressed to a larger group. For instance, Jamal (2007) carried out an effective intervention-based research on dyslexic children in Hindi language, by using pull out method in a small group. In this context, Narayanan (2013) has done intervention study with children with learning problems and LD in Marathi language by adopting a classroom approach and it yielded positive outcomes. However, more research is needed to address the need of children with learning problems and/or learning disability in a general classroom setting.

Plan of an appropriate and effective intervention programme for children with LDs needs an understanding about how children learn new things. Therefore, following sections is about different perspective on learning.

**Cognitive Developmental Perspective on Learning Language:**

Nature of learning has been a topic of debate since many years. Two teaching methods have emerged out of this controversy, i.e., *direct/explicit* and child-centred *constructivist* approach. The constructivist approach is rooted in the work of Dewey (1933), Piaget (1955) and Vygotsky (1978). Various terms have been coined for this approach of teaching and learning; for instance, anchored instruction, situated learning, discovery learning, task-based learning and scaffolding (cited by Rowe, 2006). This approach recognises the learners’ role as an active contributor; hence requiring the teaching method to help children link or bring their existing knowledge (from their environment) to the learning situation. Thus, the most influencing factor of learning in this
approach is learner’s prior knowledge, therefore, learning based on optimal support by teachers and/or peers. This is what Vygotsky (1978) called *zone of proximal development* (ZPD). In this context, the role of teachers is passive and he/she acts as a facilitator. To provide opportunities to children for learning, teachers or facilitators create an environment in which learners can acquire knowledge and construct meaning through their own activities in the process of discussion, reflection, and by sharing ideas with others, with least corrective intervention [ibid]. Two major theories of constructivist approach by Piaget and Vygotsky have been briefly described below.

**Piaget:** The basic premise of this theory is that children construct their own meaning of a word which occurs through four stages of cognitive development. Behind this construction of meaning, there are two cognitive processes which are responsible, i.e., *organisation* (organising experiences in order to get sense of the world) and *adaptation* (adopting new ideas and thoughts). This adaptation takes place in the form of *assimilation* (addition of new information in prior knowledge) and *accommodation* (process of adjusting existing knowledge to incorporate new information) (Piaget, 1955; Santrock, 2007).

**Lev Vygotsky:** Vygotsky’s theory focuses on three main ideas, i.e., *culture, language* and *Zone of Proximal Development*. According to his view, *culture and environment* play essential role in a child’s learning; however, cognitive development is the product of a process in which a child interacts with other people or elements, such as language, songs, art and play. In the framework of culture, child learns to construct meaning; therefore, in Vygotsky’s views, language is a symbolic system as well as cultural tool through which individual’s world is encoded and represented (Oakley, 2004: 38–39). In Vygotsky’s opinion, language does not only serve the purpose of social communication, it rather helps a child in problem-solving. In the process of problem solving, a child is helped by other people (like parents, teachers and peers), who are more experienced. Initially, the more experienced person holds
most of the responsibility for helping in the problem-solving; gradually, this help is withdrawn when the child gets expertise (Santrock, 2007: 237).

In Vygotsky's views, a child’s learning is affected by his or her development; however, he expressed “learning and development are interrelated from the child’s very first day of life” (Vygotsky, 1978: 84). Child’s learning does not start when he or she enters in school, rather it starts when the child comes to school with some existing knowledge, which is the platform from where learning starts in the school setting [ibid]. Hence, the child’s learning in the school setting should be matched with the developmental level of child. Once teachers begin to understand the developmental level that children begin school with, they can begin to match children with appropriate learning. However, for Vygotsky, it was important to find out at least two developmental levels: the actual developmental level (i.e., development of child’s mental functions or child’s ability to his or her work independently) (p. 85) and the zone of proximal development/ZPD (i.e., child’s mental functions which are not completely matured but are in the process of maturation) (Vygotsky, 1978: 86–87). He defined the ZPD as “the distance between the actual development as determined by independent problem solving and the level of potential development as determined through problem solving under guidance in or collaboration with more capable peers”(Vygotsky, 1978: 86). The greater the child’s ZPD, the greater is the child’s potential learning (Vygotsky, 1986).

The assistance that a child gets from a more efficient person has two ways; the first kind of assistance helps a child to give right answer and the second kind of assistance helps her/him to learn how to answer or solve similar problems in the future. The second kind of assistance has more relevance in the education setting. The process underlying within the zone of proximal development is scaffolding, where initially instructor supports children in making them aware about the necessary reading skills and strategies, and slowly this support is withdrawn. Thus, children learn to independently make use of the skills they have learnt. In order to make use of acquired skills,
children should get multiple opportunities to practice, which should be further followed by immediate, high quality feedback (Coyne, Zipoi and Ruby, 2006; Keenan and Evans, 2009: 174). The zone of proximal development has practical implications. Children in any classroom vary in terms of their mental abilities. Children with learning disability or reading disability function below grade level. By considering the ZPD for each child, teachers would be able to incorporate teaching of useful skills that can aid in their achievement. However, it is important for teachers to recognise the difference so that they could give children the scaffolding they need to perform at the level they are capable of.

Either of these approaches is not sufficient for all types of learning. Regarding the constructivist approach it has been argued that “constructivist approach to teaching is neither initially nor subsequently in the best interest of any group of children, and especially for those experiencing learning difficulties” (Rowe, 2006). Children from a disadvantaged background (who have often been found to lack phonological knowledge and phonemic awareness) taught under the constructivist approach have the possibility of compounding their disadvantage when they start going to the school [ibid]. This indicates that these children require explicit and direct instructions.

Apart from influence of learner’s interaction with other people or elements on learning outcome, the context in which interaction takes place cannot be ignored. The next section talks about how culture and context in which children develop impact their learning.

**Barbara Rogoff: Guided Participation**

One cannot ignore the context in which reading takes place. However, “human functioning cannot be separated from the cultural and more immediate context in which children develop” (Rogoff and Morelli 1989). Culture plays an important role in reading and writing. Reading and literacy are cultural inventions to meet the solutions of everyday problems (Rueda, 2011). In the opinion of Rogoff (1990: 8) “children’s cognitive development is embedded in
the context of social relationships and sociocultural tools and practices”. It is assumed that children start learning when they enter school. Perhaps “children’s learning occurs by being recipients of explicit instruction that is organised and directed by adults” (Rogoff, 2003: 301). She views cognitive development of children as an apprenticeship. She proposed the concept of guided participation and argued that “both guidance and participation in the culturally valued activities are essential to children’s apprenticeship in thinking” (Rogoff 1990: 8). According to her, children’s learning can happen in a tacit way; for example, they can learn things by watching others doing the same thing or participation in cultural activities without any formal instructions provided to them. Learning could also occur through participating in problem solving with more experienced members of their community (Rogoff, 1990). However, children’s cognitive development could be in terms of their “cultural practices and circumstances of their communities—which also change” (Rogoff, 2003: 4). The role of sociocultural activity, societal heritage, social engagement and individual efforts are inseparable. For example, child’s reading skills development could be understood in the light of “limitations and resources in the individual’s genetic makeup, and pattern of interest, in the examples and instruction provided by caregivers and teachers, and in technology structured over social history to involve specific alphabets, syllabaries, and convention of written representation” (Rogoff 1990: 26).

Cognitive developmental perspectives on learning put forward different viewpoint of learning development in children. There are different stages and process are underlying in learning to read. How children learn to read, the process and stages of reading development, interventions for the enhancement of reading skills and important components of effective interventions have been discussed in next section.
Reading Interventions

The initial part of this section has been focused on the normal course of reading development. Then, description has been given about the nature of reading difficulties/problems and reading disability. This has been followed by more current findings of the prevention and/or remediation based studies. The findings have been organised on the basis of different components of reading and the techniques used to enhance them. It has also addressed the efficacy of approaches for the treatment of reading difficulties faced by children with LDs.

Reading Development:

Reading is the primary tool of academic learning. It is known that reading is a complex phenomenon, but it is not equally complex for everyone. Many children successfully read through informal, nondirective school activities, whereas others find it very difficult. It has been found that 1 in 5 children could not read successfully in spite of getting adequate instructional practices (Foorman et al., 1998). These children face more difficulties when they move to higher grades. At this stage, children need to use their already acquired reading skills to learn academic content as support provided by teachers and elders decreases. Consequently, weak children find instructional material very difficult and they begin to fall behind academically.

Before going into the details of reading problems and intervention for the same, it is important to know how reading takes place when children start learning to read. The first stage of reading development is the symbolic stage, where children begin to mentally represent abstract concepts and ideas in the form of scribbles and lines and realise that symbols represent the meaning that they already know. After that, children read small words as whole words or pictures, known as pictorial stage. This does not include the awareness of the connection between letters of the words and their sounds and reading happens by sight.
Gradually, in the process of reading, many unfamiliar or new words come forth that children find hard to read by sight. So, they read new words by breaking them into small units and children become aware of the process they use in reading (Das, 2008: 7–8). Reading by sight is gradually transformed into reading by sound, which is referred to as alphabetic stage. Phoneme awareness further incorporates the ability of phoneme identification and phoneme manipulation. It also plays an important role in vocabulary acquisition (Moats, 2009). Familiar words are read by sight, whereas unfamiliar words are read by sound. The next stage in reading is the orthographic stage in which children learn how a word is spelled. In transparent orthography (like, Spanish, Italian, Sanskrit, Hindi), the orthographic stage does not have much importance as these orthographies share high grapheme-phoneme correspondence (i.e., letter-sound connection) (Das, 2008: 21). Sound of letters or words includes phonological lexicon coding and semantic lexicon. Lexicon is associated with semantic, morphological and syntactic information, which are necessary elements of sentence level reading (Das, 2008: 25–26; Friederici and Lachmann, 2002: 10).

The above mentioned developmental stages of reading are mainly applicable to alphabetic languages (like English). This model of reading development is not adequate enough to address reading acquisition in non-alphabetic languages. Because “literacy acquisition in non-alphabetic Indian languages that are more clearly linked to the levels of complexities inherent in the script” (Padakannaya, 2003: 64) mentioned. As phonemic awareness of children does not play an important role in the course of learning to read Indian languages (i.e., transparent orthographies), for instance, Hindi, Kannada and Oriya (Karanth and Prakash, 1996), children with LD find it a little less difficult to get hold of phonological coding (Gupta, 2004).

The final goal of reading is not merely identifying or decoding the printed text, but it refers to extracting the meaning from the printed text i.e. comprehension. Evidence suggests that some school children can read the text, but they cannot understand or comprehend its meaning. On the contrary, there
are instances that children cannot read the text fluently, but when someone else reads to them, they can easily comprehend. Reading becomes more interesting when children understand what they are reading and their reading will become faster and easier. In sum, basic reading components are phonemic awareness, alphabetic principles, mapping spoken sound to parts of words, rapid word reading, vocabulary development, orthographic knowledge as naming and recognising, and reading comprehension (Oakland et al., 1998).

Having explained reading development in children, now it is important to analyse the difficulties in reading faced by children with LD. It is known that children with reading disability have deficit in phonological skills (O’Shaughnessy and Swanson, 2000; Frost et al., 2009; Scarborough, 2009: 31). Evidence suggests that this is a result of deficit in underlying cognitive processes; for instance, working memory, phonological processing and syntactic awareness (Das, 2008: 38). The capacity of working memory is highly correlated with reading comprehension (Friederici and Lachmann, 2002:12). Poor phonological skills also affect the acquisition of early literacy skills in children at risk of developing reading difficulties. They find it hard to apply alphabetic principles that help children to develop other reading-related skills (e.g., word recognition, reading fluency and reading comprehension). Child’s sensitivity towards the component sounds (syllables, rhymes, phonemes) is associated with the better reading capabilities, regardless of their intelligence, receptive vocabulary, memory skill and social class (Otaiba et al., 2009). In this regard Oakland et al. (1998) mentioned, “Children’s phonemic awareness ability is the strongest language–related predictor of success in reading and correlates highly with reading ability through 12th grade”.

A slow rate of reading is also a sign of difficulties in reading. Along with other reading skills (such as phonemic awareness and awareness of letter-sound correspondence), decoding is also an important for successful reading. Children with reading difficulties are poor in decoding and word level reading due to which they find it hard to comprehend what they read. The relation between poor reading performance and decoding problems is well-established
(Felton, 1993; Torgesen, 2000; and Hudson, et al., 2011). For proficient reading, decoding skill is required at the level of automaticity. In this regard, Hudson (2011) mentioned, “If reading subskills are performed automatically, then comprehension and other higher-order aspects of reading can function effectively at the same time”. These children also face *centrality deficit*\(^1\) which is the consequence of inadequate cognitive resources required for linking ideas together. Due to this, children’s resources are diverted from comprehension to word decoding. Poor readers manifested centrality deficit when they did not have prior knowledge, and it reduced when children had prior knowledge. In this regard, the *knowledge compensation hypothesis*, purports that when poor decoders have no prior knowledge of the topic, they would show a centrality deficit but when they have the knowledge of the topic, that knowledge would compensate for their reduced resources for comprehension and reduce or eliminate the centrality deficit (Miller and Keenam, 2009).

Another important component of reading is *word recognition* and is a significant predictor of reading comprehension. Difficulty in word recognition is associated with deficits in children’s phonological coding (i.e., the process of translating print into sound) (Oakland et al., 1998) or phonological processing, rapid naming speed and double deficit hypothesis (Reiter, 2001). These children often struggle to *spell* correctly and find it hard to cope-up with this aspect of their learning disability (Graham, 1999; Cassar et al., 2005; Gerber and Richards–Tutor, 2011: 13; Mather, Wendling, and Kaufman 2011). These children find spellings more difficult than reading because spelling requires recall and production of entire word, whereas reading needs recognition (Ise and Schulte-Körne, 2010; Mather, Wendling, and Kaufman 2011). How to spell properly depends on the connection between letters and sound (Moats, 2006; Allaith and Joshi, 2011), and due to weak phonological

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\(^1\) *Centrality Deficit*: It says that “the more central an idea is to the gist of the text, the more likely it is to be recalled” (Miller and Keenam, 2009).
knowledge these children try to depend on graphotactic knowledge\(^2\) or the knowledge of legal and illegal letter patterns that seem to be well-developed in these children. However, many times dyslexics do not represent the sound of the target words, but their spelling looks correct (Cassar et al., 2005).

Spelling is also associated with other reading skills, such as word reading and reading comprehension, regardless of children’s reading disability status. Spelling recognition plays an important role in reading development for dyslexic as well as non-dyslexic children (Katzir et al., 2006). The ability to read letters automatically requires the knowledge to map letters and letter combination to sounds. Dyslexic children cannot memorize all words. In addition, they also find it hard to differentiate words of similar appearance (e.g., car, can and cane). Phonological awareness and morphological knowledge have been found to be strong predictors of spelling. Therefore, phonological knowledge and reading experience are helpful for the enhancement of learning of individual word orthographies and structural relationships among words (Burt, 2006).

Fluency is a core component of reading that incorporates reading printed text with speed, accuracy and expression, along with reading comprehension (Dunn, 2007). It comprises three basic component skills: accuracy\(^3\) of word decoding, automaticity\(^4\) of word recognition and prosody\(^5\) of oral text reading (Penner–Wilger, 2008). Mountain of research studies (Chard, Vaughn and Tyler, 2002; Hook and Jones, 2002; Rasinski et al., 2005; Denton et al., 2006) and research programmes (e.g., No Child Left Behind, Reading First, and the National Reading Panel) have recognised fluency as an important component

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\(^2\) Graphotactic Knowledge: Refers to the awareness of the spelling and possible combination of letters (Cassar et al., 2005).

\(^3\) Accuracy: It is an ability to produce correct pronunciation of words which occurs through sight word reading or proper use of decoding strategy. For accuracy, the required skills are “alphabetic principles, ability to blend sounds, ability to use cues to identify words in text, and a large sight word vocabulary of high-frequency words” (Penner-Wilger, 2008).

\(^4\) Automaticity: It refers to the ability of word recognition with less stress on cognition or attention (Penner-Wilger, 2008).

\(^5\) Prosody: It refers to the awareness of the proper use of elements of language with rhythm, stress, intonation (Penner-Wilger, 2008).
of an effective reading programme (Penner–Wilger, 2008). Another source of reading disability is deficit in Rapid Automatic Naming/RAN, a measure of fluency. It refers to the lexical access with which children name visually presented symbols, like colours, shapes, objects and letters and is manifested as the ability to name objects as fast as possible (Das, 2008). More number of children show deficit in fluency in comparison to decoding and comprehension [ibid].

The ultimate goal of reading is comprehension, and it is well-researched that children with reading problems face difficulties in this aspect of reading (Swanson & Alexander, 1997; Torgesen, 2000; Vaughn, Gersten and Chard, 2000; Snellings et al., 2009; Cutting et al., 2009; Harlaar et al., 2010). The poor comprehension is the consequence of deficit in word decoding and phonological skills (Høien and Lundberg, 2000: 101). However, it has also been reported that factors behind the children’s poor reading comprehension are failure to strategically process information and appropriately use background knowledge while reading, lack of meta-cognitive awareness of learning, poor knowledge of vocabulary and common text structure (i.e., narrative text structure, expository text structure), poor reading fluency, and passive reading (Berkele, Scruggs and Mastropieri, 2009).

The above-mentioned reading components are significant predictors of successful reading. Moreover, reading is less time consuming and enjoyable for those children who acquired reading skills early. As a result, good readers are likely to read more and due to exposure to written language or text, they master their reading related skills. On the contrary, poor readers continue to fall behind in reading that brings a negative effect in other areas of their academic achievement, self-esteem and motivation for learning (O’Shaughnessy and Swanson, 2000). In lower grades, the focus is on learning reading related skills; however, when they move to higher grades, children need to comprehend whatever they read. These reading components cannot be viewed in isolation as they are interlinked with each other. If children fail to
master essential reading components, they fail to understand what they read, and, consequently, they lag behind academically.

The National Reading Panel (2000) in the United States of America identified the following areas as the most important in the field of literacy and for beginning reading: *phonemic awareness, phonics, fluency, vocabulary* and *comprehension*. These five components or *big ideas* are also considered as the basic concepts for learning reading skills. Accordingly, only school curriculum was not considered sufficient to focus equally on all reading development related skills. Among these five ideas, three components, i.e., *phonemic awareness, phonics* and *fluency* are associated with the children’s ability to make sense of complex alphabetic code for single word reading, which are referred to as *inside-out*, as they require children’s to struggle with individual letters, sounds and words in such a way like working from the *inside–out*. On the contrary, *outside–in components*—are *vocabulary* and *comprehension*, which represent the children’s ability to understand word meanings, past knowledge, and strategies for understanding and constructing meaning of what they read. These components require children to get larger concepts and constructs to bear on the text in a way that works from the *outside–in*. However, children at risk for reading disabilities face difficulties in these big five components. Therefore, these big ideas are very important for the development of any effective reading instruction as these ideas focus on critical areas in beginning reading (Coyne, Zipoi and Ruby, 2006). Apart from the awareness of the big five, the knowledge of other skills is also required, which that helps beginning readers to become fluent readers. For instance, *syllabication* and structural analysis, subsumed under phonics and vocabulary instruction are some essential skills that children need to master (Boyle, 2008).

It is known that biological factors strongly influence the development of language and reading skills. A study was carried out which focused on the changes in the brain and behavioural responses through intervention training.

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*Syllabication:* It is the process of breaking words into smaller units which can be easily pronounced. This process is based on consonants—vowel-consonants/CVC rules (Boyle, 2008).
and found that through proper training, the biological factors could be modified (Molfese et al., 2002). It was found that when an intervention is effective and successful, the pattern of brain activation changes. Interestingly, the changed pattern of brain activity resembled the activity pattern of normal readers of the same age (Narayana and Xiong, 2003). Thus, children, who are at risk of reading failure, must get intervention at their early age as their brain is “much more plastic…and potentially more malleable for the rerouting of neural circuits” (Shaywitz 2003). In sum, proper remediation with children with LD helps to activate areas of the brain that are involved in reading. Training in reading skills can cause changes in how areas of the brain function.

A review of intervention based studies has been represented in following section, which includes important aspects of intervention studies and reading skills focused in these studies. It has helped to find out the gap in the existing research, which further helped to conceptualise the present study.

**Reading Intervention/Remediation: An Overview**

If we look at the kind of instructional strategies that are effective in teaching reading, researchers, in this regard, argued that various strategies should be used to meet the varied needs of children with reading difficulties. Focusing on a single component of reading, one type of intervention programme, or one teaching approach is not of much effective in helping LDs to improve their reading skills. Coyne, Zipoi and Ruby (2006) suggested that in research in any reading intervention three components should be taken care of:

(a) *content of instruction (what to teach)*,

(b) *delivery of instruction (how to teach)*, and

(c) *timing of instruction (when to teach)*.

The content of reading interventions can be derived from the researcher’s description of reading development and various components necessary for successful reading. Delivery of instruction is primarily of three types, i.e.,
conspicuous instruction⁷, instructional scaffolding⁸ and opportunity for practice with high-quality feedback (Coyne, Zipoi and Ruby, 2006). Acquiring reading instructions independently is a well-known difficulty faced by LDs. Thus, an instructor’s role is to be aware about the needed reading skills clearly or directly (that is called conspicuous instruction). In instructional scaffolding, firstly instructor supports children to make them aware about the needed reading skills and strategies and slowly these supports are withdrawn. Hence, children learn to make use of their learnt skills independently. Moreover, to make use of acquired skills, children should get multiple opportunities to practice, which should be followed by immediate and high-quality feedback. However, early identification and proper intervention help children to deal with their difficulties. The best learning happens in dyslexic children when teaching/learning instruction incorporates a combination of auditory, visual, and tactile-kinaesthetic input as well as many opportunities to practice (Coyne, Zipoi and Ruby, 2006).

In the review of literature, it was found that researchers, practitioners, child specialists and teachers have mainly focused on various essential components of reading in their studies to enhance reading in children who faced reading difficulties and disabilities. These included, but not limited to, information and awareness about phonological awareness (O’Shaughnessy and Swanson, 2000; Rashotte, MacPhee and Torgesen, 2001; Otaiba et al., 2009), letter knowledge (Otterloo and Leij, 2009), spelling (Higgins and Raskind, 2004; Hilte and Reitsma, 2008; Ise and Schulte-Körne, 2010), morphology (Schiff, Schwartz-Nahshon and Nagar, 2011), reading fluency (Thaler et al., 2004; Hintikka et al., 2008; Algozzine et al., 2009;), word recognition (Reiter, 2002; Fuchs and Fuchs, 2005; Corkett and Parrila, 2008), word segmentation

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⁷ **Conspicuous Instruction:** It is a teacher-directed approach in which systematic and structured instructions are given to the learners in the big five areas. So, learners get a chance to observe effective ways of using reading/learning-related skills before actually doing it (Coyne, Zipoi and Ruby, 2006).

⁸ **Instructional Scaffolding:** According to this, in the beginning of the learning support is provided by teachers or peers (who are more experienced) to the learners and support is withdrawn when they gain mastery over the learning skills or knowledge (Coyne, Zipoi and Ruby, 2006).
(Endress and Hauser, 2010), decoding (Denton et al., 2006; Miller and Keenan, 2009), comprehension (Vaughn, Gersten and Chard, 2000; Ae-Hwakim et al., 2006; Snellings et al., 2009), and speed problems (Serrano and Defior, 2008) of children who face difficulties in reading. Along with these components, syllables, grammar and syntax, semantics organisation at the word, phrase, sentence and discourse levels are also critical for reading.

**Measures Used for the Enhancement of Reading and Reading-Related Skills:** Review of research studies revealed that various measures have been used to enhance reading components that are necessary for the effectiveness of reading intervention programmes.

**Phonology:** The review of studies on phonological skills suggested that explicit training significantly enhanced world-level reading and spelling skills in children with reading disabilities and difficulties (Vadasy, Jenkins and Pool, 2000; Ryder, Tunmer and Greaney, 2008). Training in phonological skills resulted in positive outcomes when given to low-income background children by a regular classroom teacher (Blachman et al., 1999; O’Shaughnessy and Swanson, 2000). Recent phonological studies have also utilised narrative platform (i.e. storybook) and endorsed early reading skills outcomes (Ritter and Saxon, 2010). Embedded explicit phonological awareness intervention within the context of repeated or shared book reading showed improvement in rhyming and initial sound awareness knowledge of children (Ziolowski and Goldstein, 2008).

In a review on the efficacy of early phonological intervention for the children who were identified with speech and language impairments (Otaiba et al., 2009), it was reported that rhyme instruction with hand motion and phonological awareness training were found effective. Metaphonological therapy (rhyming, syllable clapping, alliteration, blending and segmenting), and articulation therapy were also used as a technique for the enhancement of the phonological skills of children and yielded the positive outcome. The phonological awareness intervention focused on children’s improvement of phonological awareness and speech production abilities, and researchers used
treatments which were explicit and systematic in nature. They focused on reading skills like rhyme, phoneme manipulation (i.e., detection of word position; initial, medial and final), phoneme segmentation, and blending and phoneme-grapheme correspondence. Training on correct speech production (i.e., the ability to correctly articulate the treatment target sounds) was found more effective than rhyme instruction without hand motion (Otaiba et al., 2009). Another review study also supported the use of direct and organised phonologic awareness and phonics instruction for at–risk kindergarten or Class I children with minimal exposure to reading and limited awareness of phonological and letter knowledge–precursors for the acquisition of phonological coding. The same was found to be effective with disabled readers as well (Alexander and Slinger–Constant, 2004).

**Word Recognition:** Swanson (1999a) presented a synthesis of outcomes of reading -intervention-based studies for LDs that included word recognition and reading comprehension measures. Results showed that various interventions were used for both reading measures (i.e., word recognition and reading comprehension). The interventions of word recognition studies included sequencing, segmentation and advance organisers, while reading comprehension components were directed response/questioning, control difficulty of processing demands of task, elaboration, modelling by the teacher of steps, groups instruction and strategies cues. She reported that “effect sizes for measures of comprehension were higher when studies included derivation of both cognitive and direct instruction, whereas effect sizes were higher for word recognition when studies included direct instruction” (Swanson, 1999a).

**Spelling:** As far as the method for the enhancement of spelling is concerned, various studies have incorporated several methods; for example, Cassar et al., (2005) studied the level of spelling development in two groups, dyslexics and younger normal children. Both groups were similar at the spelling level of second grade. During the assessment, phoneme counting and non-word spelling tasks were used for the measurement of phonological skills, while spelling choice task was used for measuring knowledge of legal and illegal
letter. They reported that both groups of children executed same performance and exhibited similar difficulties. However, it can be concluded that the spelling patterns of dyslexics do match with typical beginner readers (Post and Carreker, 2002; Cassar et al., 2005).

Dyslexics often face difficulties in spelling of morphological complex words, especially derived forms, due to the deficiency in morphological awareness that is relatively low in comparison to their age peers and appropriate for reading age. However, this is not associated with the poor vocabulary in comparison to their age peers (Tsesmeli and Seymour, 2006). Higgins and Raskind (2004) examined the effectiveness of two programmes (i.e., Speech Recognition–Base Programmes SRBP and AP–a computer and text-based Automaticity Programme) for the improvement of reading and spelling of LDs. Results showed significant change in word recognition, reading comprehension, phonological elision and non-word reading efficiency. “Neither program showed significant differences over contrast in spelling” [ibid]. Orthographic spelling training could be used for the improvement of reading and spelling ability. In addition, it was also found to help enhance orthographic knowledge in children with spelling difficulties (Ise and Schulte-Körne, 2010).

Orthography of language influences the spelling of children with reading disability; therefore, these children find reading of transparent words, as a whole, easier than opaque words as well as a better recall of transparent words than opaque (Baluch and Danaye–Tousi, 2006). In a study by Berninger et al., (2013) they investigated effective treatment for spelling and word decoding difficulties for dyslexics. Participants were randomly assigned to two intervention groups and interventions were given in four steps. In the first step, both groups were exposed to GPC for oral reading. The second step involved GPC for oral reading and spelling for the first group and GPC for oral reading and phonological awareness for the second group. In the third step, the first group of children was given training for orthographic spelling strategy and rapid accelerated reading programme (RAP), while the second group
continued with the second step of training. The fourth step incorporated training in morphological strategies and RAP for the first group, whereas orthography spelling strategy training was provided to the second group. All the treatment activities had incorporated such reading–writing activities that were needed for their school assignments. A significant improvement was seen in automatic letter writing, spelling real words, compositional fluency, and oral reading (decoding) rate. After orthographic training at the third step, the first group showed significant change in decoding rate that predicts the spelling of real words. At the third step, RAP training helped to increase the letter processing rate. Moreover, adding orthographic strategies with “working memory in mind to phonics helps children with dyslexia spell and read English words”.

Wanzek et al., (2006) synthesised the effects of spelling and reading interventions on spelling outcomes of LDs. They found that explicit instructions with multiple practice opportunities and immediate corrective feedback after making mistakes were mainly used and exerted positive outcome. Specifically, intervention focusing on spelling strategies and word practice methods showed high rate of improvement in spelling. Additional approaches, like sensorimotor activities and technology supports for spelling exhibited medium effects [ibid].

**Fluency:** Chard, Vaughn and Tyler (2002) reviewed 24 published and unpublished studies and reported that mainly two types of interventions had been used to improve reading fluency for children with learning and/or reading problems, i.e., *repeated reading*—repeated reading with a model, such as modelling by an adult, modelling by a more proficient peer, and modelling by audiotape or computer and *word practice approach*. In several studies, *repeated reading interventions with multiple features* had been used. For example, combination of an effective teaching component and peer-mediated repeated reading to traditional reading instruction, partner reading intervention (integrates repeated reading of text and comprehension activities—paragraph summarisation and prediction activities), combination of teacher modelled
reading, target children’s rereading to a tutor, and peer-paired reading, and target children’s rereading to the teacher were combinations used in many studies. In addition, the text difficulty, number of repetition, types of feedback and criteria for repeated readings were some other factors that have positively influenced the outcomes of fluency interventions. Finally, they concluded that intervention which consists of multiple components (that focused to increase the rate and accuracy of reading) would be more effective for children facing difficulties with fluent reading (Chard, Vaughn and Tyler, 2002).

In a study by Scheltinga, Leij and Struiksma (2009), they investigated the role of rapid digit naming, phonological memory, letter sound naming, and orthographic knowledge, to the prediction of responsiveness to a school-based, one-to-one intervention for the enhancement of word reading fluency. For this purpose, 122 Dutch children were taken from Class II and III. These children’s score was falling 10th percentile below the normative group. Pre- and post-test measures were taken to see the effectiveness of intervention. Results indicated that 38% children’s reading score was improved above the 10th percentile. No significant improvement in word reading fluency which shows that this skill of in poor reader is hard to remediate (Torgesen, 2000; Scheltinga, Leij and Struiksma, 2009). Only “rapid digit naming predicted responsiveness after controlling for the autoregressive effect in initial performance on fluency of word reading” (Scheltinga, Leij and Struiksma 2009). The manipulation strategy which includes accelerated training (Snellings, 2009) and partner reading (Vaughn, Gersten and Chard, 2000) were helpful in increasing the rate of sentence reading in LDs. Thus, intervention for the enhancement of reading fluency includes instructions; for example, modelling fluent reading, many opportunities for practiced or repeated reading, assisted reading; listening to tape while reading, and giving attention of phrasing during reading text (Penner–Wilger, 2008).

**Decoding:** Felton (1993) examined the role of instruction in the acquisition of word-identification, i.e., decoding skills in children who were at risk for reading disabilities. The sample consisted of 81 kindergarteners who had
deficit in phonological-processing skills (children characterised as having
deficit in phonological awareness or retrieval of phonological information).
They were classified into two groups and given either of the two instructions,
i.e., Code or Context instructional method. Results showed that children who
were exposed to code instruction scored more than those who received context
instruction on various reading and spelling measures. The researcher
mentioned the following elements as critical to the success of a beginning
reading programme: provide direct instruction in language analysis, reading
and spelling should be taught in coordination, reading instruction must be
intensive, and teach for automaticity (i.e., getting mastery over the basic
decoding skills helps children to perform decoding skills automatically).

Denton et al., (2006) examined the effect of an intensive decoding and
fluency intervention for children with severe reading disabilities on tertiary
level. The decoding intervention was given to children for 2 hours per day for
8 weeks and was based on Phono–Graphic programme. However, the fluency
intervention was based on Read Naturally programme and implemented for
the duration of 8 weeks and 1 hour per day. Intervention showed significant
improvement in reading decoding, fluency and comprehension. They also
found that children who remained impaired after getting two levels of
intervention (i.e., Tier 1 and Tier 2) showed stronger response to intervention
than those who had previously got only one level (Tier 1) of intervention and
children who had not exposed to prior intervention [ibid].

The above-mentioned components are the critical elements of successful
reading. Difficulties in one or more of these elements lead to difficulties in
understanding what one reads or extracting meaning from the text (i.e.,
comprehension). There are instances that children master basic reading skills
that are required for successful reading but fail to comprehend what they read.
The following section will deal with the reading comprehension, which is the
ultimate goal of reading.
Reading Comprehension

Reading comprehension is a process of extracting meaning from the text. Deficit in reading comprehension leads to difficulties in “decoding, language-learning, and meta-cognitive deficits or a combination of these difficulties” (Woolley, 2011: 49). Earlier, it was believed that difficulty in comprehension is the result of deficiency in underlying cognitive processes. However, current views suggest that it is a consequence of inefficiency rather than deficiency as these children possess necessary cognitive skills. Karnade et al., (2005) found similar cognitive abilities in children with specific LDs who had average, bright-normal and superior non-verbal intelligence. However, these children fail to use their cognitive abilities effectively; especially in the domain of strategic processing (lack of awareness about appropriate strategies needed in problematic situations and lack of understanding about how, when and where to use strategies that they have already acquired) (Gersten et al., 2001) and meta-cognition (Gersten et al., 2001; Woolley, 2011: 49).

Children with LD often face difficulties in deriving meaning from the text or what they read (Vaughn, Gersten and Chard, 2000; Ae-Hwakim et al., 2006; Snelling et al., 2009). This problem could be recognised in around Grade IV onwards; however, generally, their difficulties are exhibited in the form of weak oral language that leads to weak reading comprehension (Spear-Swerling, 2011: 153). It has been well-documented by researchers that these children need more specific and structured reading interventions as well as reading materials than their non-disabled peers (Moody et al., 2000) because appropriate reading comprehension strategies are likely to help children in “activating prior knowledge, predicting, organising, questioning, summarising, and creating a mental image” of what they read (Stahl, 2004). As these strategies act as an instrument for “assimilation, refinement, and use of content” [ibid]. Consistent practice of comprehension strategies enables children to use these strategies in other situations independently. However, more research and specific instructions are needed, which would help to build LD children’s reading comprehension skill.
Several literature reviews have been carried out to summarise the findings of reading comprehension interventions for children with LD. For instance, a comprehension-based synthesis was done by Berkeley, Scruggs, and Mastropieri, (2010) in which they analysed studies on instruction for reading comprehension of LDs from 1995 to 2006. They reported that approaches to be used across the studies were questioning/strategies instruction (includes those that incorporated peer-mediated instruction and self-regulation), text enhancement, fundamental reading skills instruction and other interventions (integrates studies based on school-wide cooperative learning programme and studies with multiple components). These approaches helped to improve the reading comprehension of LD children [ibid]. Strategies such as directed response/questioning, control difficulty of processing demands of task, elaboration, modelling by the teacher of steps, group instruction and strategies cues were used in various comprehension based studies as reported by Swanson (1999a) in her synthesis. She also reported, “Effect sizes for measures of comprehension were higher when studies included derivation of both cognitive and direct instruction” [ibid].

Leong et al., (2006) analysed verbal working memory (memory span and tongue twister), pseudoword reading (two characters), rapid automatized naming (RAN), and phonological segmentation (deletion of rimes and onsets) for inferential text comprehension in Chinese. They found that “verbal working memory had a strong direct effect on text comprehension (beta = 0.84) and an indirect effect mediated through pseudoword reading (beta = 0.44, 0.27)” . In contrast, the construct of RAN had an indirect positive effect mediated through pseudoword reading (beta = 0.37, 0.27) with a much smaller and negative direct effect on text comprehension when other relevant effects were controlled. The strong effect of verbal working memory on comprehension was partially mediated through pseudoword reading. The phonological sensitivity tasks did not make any impact to Chinese text reading. It shows that verbal working memory, the two-character pseudoword and the combined effect of both were the main contributors to comprehension.
Swanson et al., (2003) found that RAN and phonological sensitivity have poor correlation with reading comprehension.

The manipulation strategy is another technique found to be effective for comprehension enhancement (Glenberg, Brwon and Levin, 2007). Snellings et al., (2009) employed accelerated and unaccelerated training to reading disabled children, with an aim to improve reading fluency and comprehension. Two groups of children with reading disability were taken; one group received accelerated training and the other group got unaccelerated training. In post-test, the reading rate was highly increased and children were assessed at their fluency and reading level. However, result indicated that children who were exposed to accelerated training could exhibit high-sentence reading rate and high-level of comprehension. On the contrary, children from the unaccelerated training group failed to maintain this high level of fluency and comprehension. Additional techniques, such as partner reading (for the enhancement of fluency) and collaborative strategy (for comprehension) were also employed (Vaughn, Gersten and Chard, 2000). The sample consisted of two groups of children, i.e., dyslexic and low-to-average achieving children. Results showed “no significant main effects or group–by–time interaction effects”. However, a statistically significant effect was seen from pre-test to post-test on the measures of rate of reading and correct word read per minute, but failed to show significant effect in terms of accuracy or comprehension for both partner reading and collaborative strategy in both groups of children (i.e., low to average achievers) as well as children with reading disabilities. Cognitive factors like internal motivation, background knowledge activation, and children text-based questioning were found to make a significant and independent contribution to reading comprehension and reading comprehension growth (Taboada et al., 2008).

Talbott, Lloyd and Tankersley (1994) assessed the outcomes of reading comprehension-based interventions and the average effect size was reported as 1.1. They also found greater effect size in which control group children were not exposed to treatments as well as where some variables were matched
before assigning control group children in groups. In addition, assessment of the lower measures of comprehension produced strong effect size. A moderate effect size (0.72) was reported for prototypical intervention studies in a meta-analysis presented by Swanson (1999b). She also mentioned that the combination of direct instruction and strategy instruction approach resulted in higher effect size ($ES = 1.15$) for reading comprehension. In both the reviews, the effect of reading comprehension in terms of narrative and expository material was not presented separately (Talbott, Lloyd and Tankersley, 1994; Swanson, 1999b).

A descriptive review was presented by Gersten et al., (2001) in which they analysed both types of reading comprehension studies (narrative and expository text comprehension) and found that the intervention resulted in consistent improvement in children’s comprehension performance. They mentioned that for narrative comprehension, awareness and instruction in indentifying story grammar elements are effective, whereas for the improvement of expository comprehension, simultaneous use of several comprehension strategies is required. However, this study had not clearly mentioned maintenance and transfer effects. Some studies focused on content area; for instance, Maccini, Gagnon and Hughes (2002) reviewed technology-based practices for children with LD (secondary students), whereas De La Paz and MacArthur (2002) analysed instructional approaches in social science studies for mild LD children. Kim et al., (2004) examined effectiveness of graphic organisers on the improvement of reading comprehension. Gajria et al. (2007) synthesised the outcomes of comprehension of expository text for LDs. They categorised interventions in two types, content enhancement (studies which adopted instructional approaches like advance and graphic organisers, visual displays, mnemonic illustrations, and computer assisted instruction) and cognitive strategy instruction (like text structure, main idea identification, summarisation, questioning, cognitive mapping, and reciprocal teaching).

A different strategy for the enhancement of reading comprehension of children with LD is the graphic organiser (GO) (Chang, Sung and Chen,
GOs represent text in the form of visual or spatial and use various lines and arrows to present the content, concept and structure as well as how they are connected to each other. It encourages learners to observe patterns and relations, and they link their prior knowledge with the new learning which promotes conceptualisation, sequencing and comprehension of new and difficult reading material (Dustman and Parker, 2005: 4). It is evident that “the brain is able to take meaning much easier from a visual format like a graphic organiser than from written words on page” (Dustman and Parker, 2005: 5). Conceptualisation of the information on paper, aids transfer of the information from short-term memory to long-term memory. It helps to increase children’s retain and recall ability, critical and creative thinking as well as promotes their visual thinking ability. Furthermore, GOs also help teachers to know about children’s thinking patterns. It contains several techniques; for example, story maps, semantic organisers, framed outlines and Venn diagrams (Dustman and Parker, 2005: 4-5; Maston and Fodstad, 2009:1312–1313).

Kim et al., (2004) reported several types of graphic organisers in their synthesis, such as semantic organisers, cognitive maps with mnemonic, cognitive maps without a mnemonic, and framed outline. Another recent review paper by Manoli and Papadopoulou, (2012) reported that different approaches are effective in facilitating different types of reading comprehension (for instance, story maps, a kind of graphic organisers), help to facilitate narrative text comprehension. Other forms of graphic organisers, for example, matrix, semantic maps, concept maps, knowledge maps, tree diagrams and Venn diagrams are useful in enhancing expository text comprehension. Kim et al., (2004) mentioned that enhancement of expository text comprehension is more difficult as it contains more unknown or new

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9 **Framed outlines**: It includes graphically represented lesson outlines, which are helpful in identifying main ideas and how they are connected (Dustman and Parker, 2005).

10 **Semantic organisers**: It represents a relationship between concepts and features of concepts (e.g., related vocabulary) and includes semantic mapping, semantic feature analysis, and semantic/syntactic feature (Kim et al., 2004).

11 **Cognitive Map with Mnemonic**: It helps to construct a cognitive map through the use of a mnemonic (e.g., TRAVEL, RELATE) that display concepts relationships in a unit [ibid].

12 **Cognitive Map without Mnemonic**: It displays various concepts relationship in a unit [ibid].
words, share complex text structure and interconnection and contain more information that leads to weak comprehension.

Children with delay expressive language face difficulties in syntax and story grammar; however, the use of narrative structure was found to be effective (Manhardt and Rescorla, 2002). Similar findings were reported by Schornbrodt, Krins, and Gesell, (2003) in which they found that narrative intervention enhanced language skills of bilingual children with limited language proficiency. Griffin, Malone and Kameenui (2001) aimed to study the effect of graphic organisers on children’s ability of comprehension, recall and transfer of information contained in expository textbook. In addition, they explored to what level explicit instruction is needed to build autonomy in children required to create and use graphic organisers independently. For this purpose, Grade V children were chosen and placed in four experimental conditions (groups were differed on the basis of reading of social studies with and without GOs and with and without explicit instructions). Control group children were exposed to traditional basal instruction. All four groups of children performed better than the control group. Specifically, children who were exposed to graphic organiser and explicit instructions outperformed others in terms of reading and recalling subject content (social studies). Transfer measures were also observed to be higher in experimental groups than control group who got traditional instructions.

Story Maps: Children with LD face difficulties in story retelling/recalling, which is the result of lack of sequencing ability and difficulty in processing information properly (Wood, 2006: 47; Ried, 2011: 126). Children with non-verbal learning disabilities/NLD (a sub-group of learning disability) also lack the ability of narrative discourse. In this regard, Humphries et al., (2004) evaluated narrative comprehension and retelling abilities of 33 children (15 girls and 18 boys, with mean age 11.7 years). Children with NLD ($n = 11$) and verbal impairment ($n = 10$) performed equally poor on all narrative measures. Children with NLD showed poor performance in comprehending inferences and used less original content than control children ($n = 12$) in their story
retells. Any story contains various story grammars or important components; however, children with reading difficulties often lack the “ability to recall fine details, in the use of connective words that signal temporal and causal relationship, and in the type of text-based inferences made”, when these children were asked to recall the story grammar (Weaver and Dickinson, 1982). Therefore, story maps have been considered as an effective technique in promoting narrative text comprehension in these children (Kim et al., 2004).

It is known that oral narrative is an important ability required for academic success; however, children with poor reading ability often show difficulties in this aspect. Westerveld and Gillon (2008) used oral narrative intervention programmes for the improvement of story structure knowledge of children with mixed reading disability (10 children and aged between 7.11 and 9.2). These children had exhibited constant difficulties in reading, narrative comprehension and production skills, and they were assessed two years before the actual intervention. The study aimed to see the effect of oral narrative intervention on oral comprehension, oral narrative production skills and reading comprehension. It followed a non-equivalent pretest-posttest control group design and intervention was implemented for the period of 6 weeks (12 one hour session) and twice a week. The stories included in the study focused on seven story grammar elements; setting, characters, problems, goal/plan, attempts, resolution and conclusion. Results showed that the oral narrative intervention significantly enhanced the oral comprehension of children, and there was little improvement in oral narrative production skills, but intervention failed to transfer oral comprehension to the reading comprehension. Therefore, it could be said that in spite of using only oral narrative approach, adding advanced story map would help to transfer oral comprehension skill to reading comprehension skill of children because it gives children an opportunity to engage with text that contributes to the awareness of text and new vocabulary.

Story map falls under the category of graphic organisers that is primarily used to identify and conceptualise the important story grammars (like
characters, time, setting, problems, steps taken for solving the problems, outcomes) and represent narrative text in structured spatial or visual form (Boulineau et al., 2004). It also shows how story elements are related to each other which further leads to holistic understanding about the story (Gardill and Jitendra, 1999). It can be used before, during and after reading the passage or story for different purposes. For example, using story mapping before reading promotes the activation of prior knowledge and setting goal for reading, during reading for guiding readers through texts as well as comprehension and after reading helps in summarisation of the entire passage or story (Davis, 1994; Gardill and Jitendra, 1999; Boulineau et al., 2004). Therefore, for the enhancement of story retelling ability that helps in the improvement of reading comprehension of LD children, many studies have used the story map that focuses on the identification of important story grammar elements, such as main character, setting, conflict, steps taken for overcoming the conflict and theme and how these elements are connected with each other (Idol, 1987; Davis, 1994; Gardill and Jitendra, 1999; Boulineau et al., 2004).

In the following section description has been given about the research studies that have applied story mapping and supported the utility and effectiveness of story mapping in the enhancement of reading comprehension; especially for the children with reading and learning disabilities. Table 2.1 summarises 13 studies that utilised story mapping and resulted in improved comprehension of children with LD. Some studies have used only story mapping; for instance, Idol (1987), Idol and Croll (1987), Davis (1994), Vallecorsa, and de Bettencourt (1997), and Boulineau et al., (2004). An advanced form of story map instruction was used by Gardill and Jitendra (1999) which consisted of 10 general questions based on story. Results showed improvement in reading comprehension (both literal and inferential) of LD children. Above-mentioned studies (details are presented in Table 2.1) utilised story mapping, which resulted in improved comprehension of narrative text for children with LDs.
Few of the studies had added elements of meta-cognition (i.e., awareness about thinking and cognition) in their study; for example, Taylor, Alber and Walker (2002) added self-questioning with story mapping. Both the techniques resulted in improved reading comprehension, and the self-questioning group out-performed others. Majority of children who participated in the study showed strong preference of self-questioning. In the study by Therrien, Wickstrom and Jones (2006), question generation was added along with story mapping, and children were taught to generate questions during reading. Results showed improvement in comprehension (both factual and inferential questions), speed and fluency. Another study by Fagella-Luby, Schumaker and Deshler (2007) in which they compared Embedded Story Structure/ESS that included self-questioning, story structure analysis and summarising (used before, during and after reading, respectively) with comprehension skills instruction (CSI). The ESS children scored significantly higher on reading comprehension measures. Children with LD in story structure group achieved equally on reading comprehension as compared to non-LD children. This study was unique in the sense that it compared ESS with question–answer relationship, vocabulary strategies and story mapping.

In summary, it could be said that studies that have added some elements along with story mapping showed better results. It also helped to enhance comprehension of expository text (which contains more information) along with narrative comprehension.

Gajria et al., (2007) presented a synthesis of intervention studies that focused on the improvement of reading comprehension of expository text in children with LDs. For this purpose, they reviewed 29 studies that had described about 34 different interventions. All interventions were categorised into two types; content enhancement (e.g., advance organisers, visual display, mnemonic devices and computerised instruction for practice) and cognitive strategy instruction (children were taught to learn from their reading by engaging with expository text in novel ways, identifying new ideas, summarising, creating questions and answering them as they read), drawing
cognitive maps, or identifying different types of text structures and deliberately engaging with each in proper way. These two types of interventions resulted in improved reading comprehension and the average effect size reported across all studies was 1.64 (SD = 1.19). They finally concluded that content enhancement tools create in children a dependency on the tools, whereas cognitive strategy instructions provide opportunity to children to create their own way of learning that gives children autonomy for using strategy in the new reading and learning situations. At last, they suggested that these two approaches could be combined as children could be trained about the proper use of strategies for content enhancement as well how to create such materials independently for their own use. In a recent review by Stetter and Hughes (2010), they mentioned that techniques like story grammar and story mapping resulted as effective tools for the improvement of reading comprehension of special needs and reading disabled children. Furthermore, teaching children meta-cognitive skills along with story mapping enable children to use their acquired strategies in independent situations.

**Mode of Instructional Delivery:** The effectiveness of one-to-one intervention programme is well-established by researchers (Berninger et al., 1999; Vadasy, Jenkins and Pool, 2000; and Torgesen et al., 2001). In addition, intervention studies carried out in a small group of children have also been well-researched and their effectiveness has been recognised (Kamps et al., 2008; Rashotte, MacPhee and Torgesen, 2001). If we look at the story mapping studies presented in Table 2.1, few studies have been carried out on large group and yielded a positive effect (Chang, Sung and Chen, 2002; Knox, 2008; Fagella-Luby, Schumaker and Deshler, 2007). In this regard, Iversen, Tunmer and Chapman (2005) suggested that “by increasing the instructional time by about a quarter, reading recovery teachers can double the numbers of students served without making any sacrifices in outcomes”. Thus, interventions could be provided in large group without compromising its effectiveness.

**Person Implementing the Intervention:** The role of the implementer of intervention on the outcome of the programme cannot be ignored. Many
studies have reported that the ‘researchers delivered studies’ have yielded more positive outcomes than ‘teachers delivered interventions’ (Swanson et al., 1999). Wanzek et al., (2006), in their synthesis, did not notice much difference in outcomes whether researcher or teachers implemented the intervention. However, some recent studies did not support these findings. Kim et al., (2004) and Gajria et al. (2007) mentioned that interventions delivered by teachers and/or other school personnel resulted in more positive outcomes.

A meta-analysis by Berkeley, Scruggs and Mastropieri (2010) showed contradictory results, i.e., studies implemented by researchers were found to be more effective than those implemented by teachers. However, they suggested the possible reason behind the effectiveness of the instructions delivered by researchers that it is not due to the fact that researchers are better teachers rather that they are familiar with specific and effective strategies and the better way of implementation. Finally, they mentioned that “with additional training and perhaps more ‘ownership’ of the instruction by teachers, these strategies could be even more effective”. However, interventions could be provided by nonprofessional tutors effectively after giving proper instructions to them (Vadasy, Jenkins and Pool, 2000).

**Duration:** The time and duration of intervention programme add to its effectiveness. Jitendra et al., (2004) examined the effect of duration of intervention programme on the outcome. In the first year of study, the reading disabled children of two studies were exposed to Read Well instructions where instruction was given for a period of 2–7 weeks and yielded positive improvement for passage fluency. In the second year, the duration of Read Well instruction was increased (i.e., 2–16 weeks), which led to the improvement in reading, spelling and comprehension. Therefore, it can be concluded that achieved gains in the second study were due to increased instructional intensity and duration of instruction. In a synthesis by Kim et al., (2004), analysis was done to see the effect of graphic organisers on reading comprehension. They noticed that maximum interventions were implemented
for a duration of 1–3 weeks (2–12 sessions) and only two interventions lasted for longer duration (12–16 weeks). A meta-analysis by Berkeley, Scruggs and Mastropieri (2010) reported that moderate length treatments exerted higher effects in comparison to shorter or longer interventions. In their synthesis, Wanzek et al., (2006) reviewed 19 reading and spelling interventions published during 1995–2003. The duration of the interventions was from 2–9 months. Result showed that interventions of shorter duration (3 weeks and less) exhibited highest effects. Thus, the duration of any reading intervention programme depends on the nature and number of reading components to be focused in the objectives.

In sum, for an effective intervention various aspects need to be considered, for instance, components of the intervention, mode of delivery, person implementing the intervention and duration of the intervention. These components have been well defined in the researches based on intervention programme for children by Narayanan (2013) and Shetty (2013). A detailed review of intervention based studies facilitated the path towards the identification of gaps in the existing literature.

**Gaps in the Research:** The main aim of reading is to comprehend what a reader reads. Children with learning disability often find hard to extract meaning of the text material. There is also a dearth of Indian researches in the field of reading related intervention; especially reading comprehension. Therefore, the present study focussed on the enhancement of reading comprehension ability of children with learning problems and learning disability. As mentioned earlier, children with LD often faced difficulties in story retelling that leads to difficulties in reading comprehension; however, techniques like *story mapping* have emerged as an effective instrument for it. Thus, the present study has focused on the enhancement of reading comprehension with the help of story mapping strategy by adding an extra element i.e., drawing story elements on a sheet of paper in the same way as story has taken place. In spite of the fact that story mapping is an effective approach for the development of reading comprehension, several gaps have
been found in the existing literature. For instance, majority of the studies have been carried out on small group of children, so there is a need to apply this approach in a larger group. Furthermore, story mapping helps to improve comprehension of story or better recall of elements of story grammar (i.e., narrative text where events and dialogues represent a link). However, is not well-documented (Stetter and Hughes 2010) that how these elements would be transferred for the enhancement of comprehension of expository text (i.e., text written with the purpose to express information about a specific topic or theme). Another gap noticed is that instead of teaching children how to use story maps, training in creating story maps for themselves may enable children to develop strategies independently and how to use them in another situation (content area or situations outside school). The researcher planned to incorporate story-mapping strategy in the whole classroom approach that would help diverse groups of children.

For an effective intervention programme, apart from the content, duration of intervention, who is delivering the intervention, and generator of the intervention materials are also important factors. As far as the implementer of the interventions is concerned, Kim et al. (2004) reported that researcher-developed assessment materials yielded higher effects than teacher-developed and student-developed assessments. Therefore, the present study trained teachers to implement the story mapping procedures in general classroom because teachers are most accessible resource in educational settings. It was also noticed in the synthesis by Kim et al., (2004) that most of the interventions lasted for a shorter duration (1–3 weeks). Hence, an intervention for longer duration would help us to transfer as well as generalise the intervention effects. This was also in keeping with Iversen, Tunmer and Chapman’s (2005) recommendation of increasing the duration of the intervention in order to cater to a larger group. Training children in generating graphic organisers would be more effective as in maximum studies teachers or researchers were the generator of the graphic organisers Kim et al. (2004). Therefore, long-term assessment of intervention study is required to see the
retention, maintenance and transfer of training effects (Manoli and Papadopoulou, 2012).

Identified gaps funnelled to conceptualise the present study and selection of the appropriate methodology for addressing the objectives. A detail of the present intervention programme, objectives and methodology has been presented in the next chapter.
<table>
<thead>
<tr>
<th>Study</th>
<th>Study Design, No. of Participants and Grade</th>
<th>Duration</th>
<th>Person Implementing Intervention</th>
<th>Main Focus of Intervention</th>
<th>Outcomes</th>
<th>Follow-up</th>
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</thead>
<tbody>
<tr>
<td>Idol (1987)</td>
<td>Experimental multiple baseline (2 groups), 27 students (LD or low achievers), Grade III and IV</td>
<td>Baseline-4 and 8 days (groups 1st &amp; 2nd respectively), Intervention- (11 and 9 days), Maintenance- (6 and 4 days)</td>
<td>Teacher</td>
<td>Effectiveness of story mapping for children with and without LD</td>
<td>Improvement in the measures of reading comprehension for all and LD improved equally as their non-LD peers.</td>
<td>-</td>
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<tr>
<td>Idol and Croll, 1987</td>
<td>Single subject ABA multiple baseline- 5 children with mild learning handicaps &amp; comprehension - elementary students</td>
<td>4-10 sessions of story grammar instructions</td>
<td>Teacher (not a regular teacher) given necessary training</td>
<td>Training on when and how to use story mapping</td>
<td>All students improved comprehension of narrative stories. 4 out of 5 reached a mastery level of 80% correct comprehension maintained after withdrawal of</td>
<td>Maintenance was assessed when a student reached stability at or above the criterion level of 80% correct comprehension.</td>
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<tr>
<td>Study</td>
<td>Design/Modality</td>
<td>Participants</td>
<td>Baseline</td>
<td>Intervention</td>
<td>Researcher</td>
<td>Effectiveness</td>
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<tr>
<td>Gardill &amp; Jitendra (1999)</td>
<td>Single subject multiple baseline-6 LDs, -Grade VI and VIII</td>
<td>Baseline- (2-6 weeks)</td>
<td>Intervention- 14-20 weeks</td>
<td>Researcher</td>
<td>Effectiveness of direct instruction of advanced story map on the reading comprehension</td>
<td>Resulted in increased reading comprehension, understanding of story grammar as well as maintained the gains after the intervention</td>
</tr>
<tr>
<td>Boulineau et al., 2004</td>
<td>-ABC design (single subject)-6 SLDs -3rd &amp; 5th</td>
<td>Baseline- (4 sessions)</td>
<td>Interventions (5 sessions)</td>
<td>Teacher</td>
<td>Effects of story map on reading comprehension of LDs</td>
<td>5 out of 6 showed improvement on story elements, and maintenance was also noticed.</td>
</tr>
<tr>
<td>Tylor, Alber and Walker, 2002</td>
<td>Alternative treatments design, (single subject) -5 LDs -Grades III-VI</td>
<td>33 sessions (3 sessions per week)</td>
<td>Special education teacher</td>
<td>Story Mapping + self-questioning for enhancing reading comprehension</td>
<td>Greater comprehension was seen in the self-questioning &amp; story mapping. 4 out of 5 students</td>
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<tr>
<td>Authors</td>
<td>Design/Details</td>
<td>Intervention/Results</td>
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<tr>
<td>Vallecorsa and de Bettencourt, 1997</td>
<td>Multiple baseline ABC design (single subject), 3 students Baseline (5-12 sessions), intervention (5-12 sessions)</td>
<td>Effect of story elements via story mapping to increase comprehension in two out of three students.</td>
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<tr>
<td>Therrien, Wickstrom and Jones, 2006</td>
<td>Experimental design (pre and post-test), single factor design, 60 LDs, Grades IV-VIII (fourth, n=13, fifth, n=10, seventh, n=6, and eight, n=1) with LD in reading, and (n=16 or n=14) for reading failure (2 grade lag than current placement) who had 4 months -50 stories were given to children with increase difficulty level. Session was ranged between 10 to 15 minutes. Intervention was done individually in a pull out setting. Teachers after getting training from the researcher.</td>
<td>Story elements and question generation resulted in improved reading comprehension, speed and fluency. More improvement was seen in last 10 stories than initial 10 stories.</td>
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instructional reading levels at first ($n=5$), second ($n=4$), third ($n=14$) or fourth ($n=7$) grade participated in the study.

### Davis 1994
- **Experimental design** with two treatment groups
- 60 students (30 from each grade), Grade III and V
- Not mentioned -teachers were selected to provide instructions from respective class and given training
- Effect of Direct Reading Activity (DRA) and story grammar on literal and inferential reading comprehension.
- Story mapping procedure resulted in 14% better inferential comprehension ($p<0.0005$) and 7% better literal comprehension than DRA did.

### Shelton 1999
- **Multiple baseline, single subject design** (case study)
- 2 (1 boy, aged 9:2 and 1 girl, aged 10:2) with language and story telling ability was increased in both the subjects.
- Model story task, baseline and intervention.
- Expert (clinician)
- Effect of structured approach to teaching story grammar components,
<table>
<thead>
<tr>
<th>Learning disability</th>
<th>Intervention (8-15), each session for 25 minutes twice a week.</th>
<th>Including the use of visual symbols, would be effective for story production</th>
</tr>
</thead>
<tbody>
<tr>
<td>Grade III boy and</td>
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<td>Grade IV girl</td>
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</tbody>
</table>

**Faggella-Luby, Schumaker & Deshler 2007**

- Classroom approach
- 79 heterogeneous group of students (limited ability of reading comprehension and mathematics)
- Grade IX

- 9 day instruction session with 90 minutes of instruction on days 1 and 9 and 120 minutes of instruction on days 2 through 8

**Researcher**

- Embedded-story structure/ESS (Self questioning, Story structure analysis and summarising components of intervention) and comprehension skills instruction (CSI).

**Significant differences were found between groups in favour of the ESS routine on measures of strategy use, story structure knowledge and unit reading comprehension.**

**Results indicated equivalent gains for ESS students regardless of disability versus non-disability.**
<table>
<thead>
<tr>
<th>Chang, Sung &amp; Chen</th>
<th>Experimental design (pre and post test), One between-subjects factor group -126 (60 girls &amp; 66 boys) -5th grade</th>
<th>7 weeks 4 groups- map correction, scaffold fading &amp; map generation &amp; control group</th>
<th>Researcher</th>
<th>Effect of concept mapping to enhance text comprehension &amp; summarisation</th>
<th>Map-correction method enhanced text comprehension &amp; summarisation abilities &amp; scaffold fading facilitated summarisation ability.</th>
</tr>
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<td>2002</td>
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<td>Dole, Brown and Trathen, 1996</td>
<td>1st phase- 67 at risk children -V and VI II phase-2 students from selected from strategy group.</td>
<td>Monday to Thursday for 5 weeks for 50 minutes each session</td>
<td>Teacher, graduate student and researcher, they were experienced upper elementary teachers</td>
<td>Examined the group and individual differences arising from strategy instruction. 3 groups- strategy instruction, story content and basal control instruction</td>
<td>-3 groups performed well. The strategy group outperformed the story content and basal control group when students were asked to read selection on their own.</td>
</tr>
</tbody>
</table>
Students’ motivation can influence their use of the instruction they receive.

**Knox 2008**

- a three-group: story mapping group, story-Mapping/rejoined group & comparison group (9, 11, 11 respectively) time series design
- 31 students (Class 7th & 8th) students with SLD in reading & writing

<table>
<thead>
<tr>
<th>Source</th>
<th>Compiled by the researcher from cited studies.</th>
<th>Effect of story mapping &amp; teacher rejoined questions to improve reading comprehension</th>
<th>Study resulted in success in students’ performance but no significant difference among groups for SLD students when using story maps &amp; teacher rejoined questions.</th>
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<td></td>
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<td>Teacher</td>
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<td></td>
<td></td>
<td>Session lasted for 75 minutes every other day for 12 weeks.</td>
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