Chapter I

Introduction and Conceptual Framework of the Study
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INTRODUCTION AND CONCEPTUAL FRAMEWORK

1.1 Backdrop of the study

Dyslexia is a Specific Learning Disability (SpLD). Dyslexics have persistent difficulties in learning to read and developing reading skills. Reading is a fundamental skill in which students have to master to acquire knowledge and information. Therefore, failure in learning to read leads to poor academic performance (Karande & Kulkarni, 2005) which will ultimately ends up in turning the student into school drop-outs (Thacker, 2007; Lyon, 1996). If such students were identified at an early stage as dyslexics or “At risk of dyslexia”, their reading difficulties could be minimized through appropriate remedial reading interventions (Torgesen, 2002; Scammacca, et al., 2007; Fletcher et al., 2007; Pennington, 2009) and they could be prevented from developing into severe dyslexics.

Dyslexia is one of the most serious issues that needs to be addressed, as in India it is estimated that 10-14% of school going students are diagnosed and suffering from Specific Learning Disabilities (Krishnan, 2007; Krishnakumar, 1999; Mehta, 2003). The researchers reported that at least five students in an average sized classroom have SpLD (Thomas, Bhanutej, & John, 2003). Dyslexia was found to be one of the most common SpLD, affecting 80% of all those identified as having Specific Learning Disabilities (Karande, et al. 2005). Research studies documented that there was a lack of awareness about SpLD in India (Karande, Mehta & Kulkarni, 2004; Crawford, 2007, Ramaa, 2000). There was a shortage of facilities for remedial teaching to the students with SpLD because of the lacunae of trained teachers to teach the students with dyslexia and SpLD (Karande, Mahajan & Kulkarni, 2009; Rajakumar et al., 2005). The remedial training facilities for these children were available in some of the megacities like Mumbai, Kolkata, Bangalore, New Delhi and Chennai (Karande, 2008). In spite of this, these services were not affordable for many parents because the cost of remedial training ranges from Rs. 250 to Rs. 500 per session (Karande & Gogtay, 2009; Karande, Mehta & Kulkarni, 2004). More than that, these facilities were not made available to rural children with SpLD, specially those who studying in their mother tongue. Therefore, it is imperative and inevitable to develop reading interventional
strategies to help these students and frame policies to identify those at risk of dyslexia students and ensure assistance to minimize their reading difficulties.

The present study focuses on identifying at risk dyslexics in their primary grades and developing a multisensory strategy to improve their reading performance in English. Reading is fundamental to function in today's society and is a significant part of learning. So it is an inevitable requirement in any field or subject – from language to science and mathematics. That too specifically, developing reading skills in English is warranted because English is an international language and a rich source of knowledge and information are scripted in English language. The importance of learning English language as stated by Dr. Radhakrishnan (1948), “English is a language which is rich in literature—humanistic, scientific and technical. If under sentimental urges we give up English, we would cut ourselves off from the living stream of ever-growing knowledge”. Learning to read in English is a difficult task for students with dyslexia as well as those at risk of dyslexia because English language is a second language for these students in India. If the problems of these students are not treated, they may develop an aversion to learning English, especially learning to read in English. It is in this backdrop, that the intervention strategy was developed for the students to improve their reading performance in English.

1.2 History of Dyslexia in India

The origin of dyslexia and Specific Learning disabilities (SpLD) is recent in India when compared to western countries (Ramaa, 2000). For the first time in India, the term dyslexia received recognition in year, 1996, when the first clinic for Specific Learning Disabilities was set up at Lokmanya Tilak Municipal General Hospital and Medical College (LTMGH), Sion Mumbai. In addition, the first Dyslexia association in India, the Maharashtra Dyslexia Association was started by the parents of dyslexic children in 1996. At present it is one of the members in the global partnership with the International Dyslexia Association. The Maharashtra Government is the first state in India which recognised dyslexia and specific learning disabilities, and grants provisions and concession for the students with dyslexia from 1996. Initially it provided provisions and concession only for the ninth (IX) and tenth (X) standard students with dyslexia. Later in 1999, it was extended to twelfth (XII) standard students with
dyslexia. In line with the Maharashtra Government, many states in India like Tamil Nadu, Andhra Pradesh, Karnataka and Kerala have also started to offer provisions and concessions to the students with dyslexia and specific learning disabilities.

1.2.1 Present status of Dyslexia and Specific Learning Disabilities in India

Dyslexia is one of the Specific Learning Disabilities (SpLD). The Rights of Persons With Disabilities Draft (2012) refers to it as “a heterogeneous group of conditions wherein there is a deficit in processing language, spoken or written, that may manifest itself as a difficulty to comprehend, speak, read, write, spell, or to do mathematical calculations. The term includes such conditions as perceptual disabilities, dyslexia, dysgraphia, dyscalculia, dyspraxia and developmental aphasia” (Ministry of Human Resource Development: Govt. of India, 2012). In India, there are no exact statistical details available about persons affected with Specific Learning Disabilities due to the lack of standardized tools (Ramaa, 2000) available in different languages to assess SpLD, multi-lingual system, lack of trained manpower (Saravanabhavan & Saravanabhavan, 2010; Ravi, 2013) to screen for SpLD. Moreover, it is not visible, but a hidden disability (Karande & Kulkarni, 2005) like other disability categories (Karande, Sholapurwala, & Kulkarni, 2011).

The statistical data which is available in the relevant literature in India about the prevalence of students affected with specific learning disabilities is scanty (Karande, Mehta & Kulkarni, 2004). Therefore, the exact prevalence rate of persons with SpLD and dyslexic population is not available. From the research studies, it is found that approximately 10-14% of the 416 million children (41.6 lakhs) in India have SpLD (Krishnan, 2007; Krishnakumar, 1999; Mehta, 2003). On the other hand, other research studies reported that approximately 15% school-going Indian children have SpLD in India (Mittal et al., 1977; Karande & Gogtay, 2009; Sakhuja, 2004; Karande & Kulkarni, 2005; Ramaa, 2002; Thaker, 2007) and they are at the high risk of dropping outs due to poor performance in academics (Karande & Kulkarni, 2005). In addition to this, other research studies have documented that SpLD affects 3-10 percent School going students (Arun, et al., 2013). In line with the statistical report on the prevalence of SpLD, Gupta & Whitehead (2014) reported that “only 0.1 percent students are being
identified though the number could be 20 percent. The expected number of SPLD could be approximately 40 million”.

1.3 Significance of the Conceptual Framework and its Operation

A conceptual framework describes the link between the variables. In this context, the conceptual framework analyses the link between the variables used in the present study. This interlink helped the researcher to operate the variables. The following variables, like at risk of dyslexia and their problems in reading, components of reading and appropriate reading intervention were conceptually operated by the researcher based on the insights gained from the conceptual framework.

1.4 Historical Background of Dyslexia

The term dyslexia is derived from the two Greek words “dys” which means difficulty or trouble and “lexis” meaning word or language. Thus, the term dyslexia refers to “difficulty with words or language” (Doyle, 2002). The origin of dyslexia emerged from a German ophthalmologist, Rudolf Berlin who made the first reference to the term in 1872. Later in the year, 1877, Adoulf Kussmaul suggested a term “word blindness” (Shaywitz S, Shaywitzx BA, 2003) to refer to dyslexia. Oswald Berkhan, a German physician was the first person who identified dyslexia in 1881. Then, in 1884, Rudolf Berlin coined the term dyslexia to refer to word blindness. The first case of developmental dyslexia was reported by an English physician, Pringle Morgan in 1896. He published the first description of a learning disorder known as developmental dyslexia in the British Medical Journal titled "Congenital Word Blindness". In the journal, he wrote about Percy F., "a bright and intelligent boy who was quick at games and no way inferior to other boys his age and yet displayed an inability to read" (Shaywitz, 1996).

James Hinshelwood was one of the pioneers in the field of Specific Learning Disabilities, during the late 1890s and early 1900s; he published a series of articles describing similar subjects about congenital word blindness in the medical journals as mentioned by W. Pringle Morgan. In 1917, he published a book entitled “Congenital Word Blindness” in which he stated that the people with Specific Learning Disabilities have difficulties in visual memory for letters and words. Letter reversals, spelling
difficulties and problems in reading comprehension are some of the symptoms of SpLDs. Later in the year 1962, Samuel Kirk coined the term “learning disabilities” which refers to the group of specific learning disabilities like dyslexia, dyscalculia and dysgraphia.

The evolution of dyslexia reveals that the term was first considered a medical term and a field of research for physicians. Historical traces of dyslexia reveals that various terms were used to refer to dyslexia such as congenital word blindness, developmental dyslexia, specific learning disability, specific reading disability, reading impairment, etc. (Doyle, 2002). Then there change occurred through the works of Samuel T Orton and Anna Gillingham which paved ways for the educationalist and psychiatrist to explore the area and develop the reading skills of dyslexics through reading interventions.

Samuel Orton was one of the first researchers who linked dyslexia with language describing developmental dyslexia as a language disorder. Myers and Hammill (1976) stated that “There is widespread agreement among researchers today that dyslexia is a language disorder”. Later, Orton worked with Anna Gillingham, a psychologist and educator to develop an educational intervention to teach reading skills for the dyslexics using simultaneous multisensory instruction. In 1960, they published a book entitled “The Gillingham Manual: Remedial Training for Students with Specific Disability in Reading, Spelling, and Penmanship” which describes the principles and strategies to be adopted while teaching dyslexics to improve their reading performance in a more systematic and scientific way through a multisensory approach.

In the early 1970s, a new hypothesis emerged which described that dyslexics have difficulty in phonological processing. The affected individuals have difficulties in associating sounds with the symbols; that is the visual letters. Many researchers have proved that there was a strong link between the phonological awareness and dyslexia (Foorman, et al 1997; Oakland et al, 1998; Torgesen et al, 2008). A deficit in the area of phonological awareness is an indicator to identify dyslexics at an early stage. There was a plethora of research evidence which stated that the core deficit of dyslexics lay in their phonological awareness. This has become a turning point in the field of dyslexia,
the phonological deficit theory paved the way for the educationalists and psychologist to carry out research in this area. Earlier, the term dyslexia was only used in the medical field and was an area of concern for doctors alone because earlier, dyslexia was associated only with the brain. From the late 1970 onwards, deficit in the phonological awareness of the dyslexics was the predominant area of research for the academic community to enhance the reading performance of monolingual and bilingual dyslexics.

1.4.1 Definitions of Dyslexia

The researcher found that there were many definitions of dyslexia quoted in the related research studies. The researcher selected the below two famous definitions which is most related to the present study. The definitions are,

- Dyslexia is “evident when accurate and fluent word reading and/or spelling develops very incompletely or with great difficulty. This focuses on literacy at the word level and implies that the problem is severe and persistent despite appropriate learning opportunities” (The British Psychological Society [BPS] (1999, p.18).

- Dyslexia is “a specific learning disability that is neurological in origin. It is characterized by difficulties with accurate and/or fluent word recognition and by poor spelling and decoding abilities. These difficulties typically result from a deficit in the phonological component of language that is often unexpected in relation to other cognitive abilities and the provision of effective classroom instruction. Secondary consequences may include problems in reading comprehension and reduced reading experience that can impede the growth of vocabulary and background knowledge”. (Adopted by the International Dyslexia Association (IDA) Board of Directors: November 12, 2002).

From these definitions of dyslexia, it is found that the dyslexics have difficulties in reading such as problems in accurate word reading, decoding and fluency due to the deficit in the phonological component of language. Therefore the dyslexics have problems in reading skills due to the phonological difficulties.
1.4.2 Theories of Dyslexia

Based on the causes, the theory of dyslexia is classified into three major deficit theories. These deficit theories are (i) the phonological theory which explains the abnormality in speech sound processing (ii) the cerebellar theory which explains abnormality in the brain function as a causal factor for dyslexia in individuals and (iii) the magnocellular (combination of visual and auditory deficit theory) theory which explains the dysfunction in neuro-physiology and neuro-anatomy. The last two theories are concerned with the biological aspects of dyslexia, whereas, the phonological theory is very closely related to the language aspects i.e. speech sounds. Many studies found that dyslexics have major problems in speech sound processing which in turn affects the reading processes, which be remediated with appropriate remedial intervention. In this line, the researcher designed an intervention which comprises of phonological components.

Figure 1.F.1: Pictorial Representation of Theories of Dyslexia

1.5 Need for a teacher to understand the symptoms of dyslexia

India is progressing towards inclusive growth at all levels of education as per the 12th five year plan. The Ministry of Human Resource Development initiated the inclusive growth in elementary education through the Sarva Shiksha Abiyan (SSA) Programme. The main aim of SSA is to achieve 100 percent literacy in primary
education. The aim of SSA is still unachievable due to dropouts and lack of curriculum integration for special needs children (Annual Status of Education Report, 2014). Therefore, the SSA initiated a new programme ‘Inclusive Education” for the betterment of life skills for special needs children. Dyslexics are one among the Special Needs children who need attention from teachers. Though the teachers were given adequate training towards special needs education, they still have problems in identifying the dyslexics and to remediate them. Studies in India have shown that teachers lack knowledge toward symptoms of dyslexia. Therefore, it is the need of the hour for teachers to have knowledge and awareness of dyslexia and its symptoms. The understanding of the symptoms of dyslexia helps teachers to identify the students with dyslexia and those at risk of dyslexia in the early stages of education.

Figure 1.F.2: Symptoms of Dyslexia

1.5.1 Types of Dyslexia

Over the years, dyslexia was classified into many types by various researchers. The following are the predominate types of dyslexia:
**Acquired Dyslexia:** It is also termed trauma dyslexia that occurs due to brain injury or a serious illness which affects the functions of the brain controlling reading and writing. This type of dyslexia is not inherited in nature; it affects the individual’s reading ability.

**Developmental Dyslexia:** Developmental dyslexia, otherwise known as secondary dyslexia, occurs during the developmental phases of the foetus. There are problems in the development of the brain leading to impaired neurological abilities in word recognition and spelling. It is assumed to be caused by hormonal development during the early stages of foetal development. Developmental Dyslexia diminishes as the child matures.

**Phonological Dyslexia:** It is an extreme form of difficulty in reading that results in phonological impairment where individual’s with phonological dyslexia have trouble in manipulating the basic sounds of the language. This type of dyslexia is synonymous with dyslexia itself. Phonological Dyslexics have difficulty associating letters with its sounds.

**Surface Dyslexia:** It is a kind of dyslexia defined by the difficulty in recognizing and spelling whole words. Individuals with this type of dyslexia may be able to sound words out well, even nonsense words (referring to meaningless words), but they cannot read or spell words that have irregular spellings.
Phonological dyslexia is the predominant type of dyslexia that exists in India. Many researches were conducted to remediate the phonological problem of dyslexia (Ramaa, 2000; Paramadhyalan, et al., 2009; Jeyasekaran, 2015). In line with these studies, the present research also attempted an investigation on phonological dyslexia and designed an intervention based on their reading needs.

1.6 Need to Understand those At Risk of Dyslexia

Research Studies have emphasised the importance of early identification of children with dyslexia (Birsh & Schedler, 2011; Gallagher, Frith and Snowling, 2000; Nevills & Wolfe, 2009; National Reading Panel, 2000) and proved that appropriate early intervention reduces the reading difficulties of students with “At Risk of Dyslexia” (Snowling, 2013; Vellutino, Scanlon, Small, & Fanuele, 2006). Many researchers have documented the indicators of children at risk of dyslexia for identification. First, the children of dyslexic parents are considered as “at risk for dyslexia” (Scarborough, 1990; Elbro, Borstrom, & Petersen, 1998; Pennington & Lefly, 2001; Hindson et al., 2005; Lyytinen et al., 2006;) and secondly, the children who exhibit severe difficulties in phonological awareness tasks (Snowling & Hulme, 1994; Swan & Goswami, 1997; Snowling, 1998; Metsala, 1997; Snowling, Bishop, & Stothard, 2000; Ramus, 2001), alphabet knowledge (Adams, 1990; Muter, Hulme, Snowling, & Taylor, 1998) and Rapid Automatised Naming (RAN) (Snowling, 2000) are considered as the children at risk of dyslexia. Phonological awareness refers to the ability to recognize and operate the sounds of spoken words. The term alphabet knowledge refers to the understanding of letter- sound association and Rapid Automatised Naming refers to the ability to name the stimuli as quickly as possible as it has association in developing reading fluency. Therefore, the difficulties in phonological awareness tasks (Stanovich, 1992; Torgesen, Wagner, & Rashotte, 1994; Badian, 2001; Patel, Snowling, & de Jong, 2004; Carroll & Snowling, 2004), alphabet knowledge (Snow et al., 1998) and RAN (Wolf & Bowers, 1999; Cornwall, 1992) are the best predictors to identify children “at risk of dyslexia”. In support of this hypothesis there is ample research evidence reported in relevant literature (Scarborough, 1990; Bruck, 1992; Swan & Goswami, 1997; Elbro et al., 1998;
Snowling, Gallagher, & Frith, 2003; Lyytinen et al., 2006). In addition to this, children from non-English speaking families, minority group and poverty groups are termed as “at risk of dyslexia” (Adams, 1990; Hart & Risley, 1995; Fernandez-Fein & Baker, 1997; Snow, Burns, & Griffin, 1998; Ehri & Roberts, 2006; Weigel et al., 2006; McGinty & Justice, 2009). The indicators of “at risk of dyslexia” are discussed elaborately in the forthcoming sections of this chapter and the schematic representation of the indicators of “at risk of dyslexia” is presented in figure 1.F.4.

**Figure 1.F.4: Indicators of “At Risk of dyslexia”**

The Figure 1.F.4 shows the indicators of “at risk of dyslexia” i.e., phonological awareness, Alphabetic knowledge and rapid automatised naming. The mechanism of the above figure shows that knowledge on phoneme (Speech Sounds) enhances alphabetic knowledge which leads to rapid naming of alphabets.

1.7 **Significance of Early Intervention of Students “At Risk of Dyslexia”**

Early intervention helps to reduce the reading problems of children “at risk of dyslexia” and prevent them from turning into dyslexics. The core deficit for children
“at risk of dyslexia” lies in the area of phonological awareness (Denton, Fletcher, Anthony & Francis, 2006) and researchers identified that the difficulties in phonological awareness is one of the best indicators of “at risk of dyslexia” (Ehri et al., 2001; Wagner et al., 1997; Muter & Snowling, 1998; Manis et al., 2000; Kirby et al., 2003) it foretells the success in the later stages of the reading development of an individual (Muter, et al., 1998; Manis, Doi, & Bhadha, 2000; Kirby, Parrila, & Pfeiffer, 2003). Therefore, researchers emphasised the need for multisensory reading intervention for children “at risk of dyslexia” in their core deficit, phonological awareness through direct, structured and systematic training (Moats, Farrell & Brish, et al., 2005). Researchers have reported that intervention in phonological awareness alone is not sufficient to reduce the reading difficulties of children “at risk of dyslexia” as well as dyslexic children (Torgesen, 2005; Hatcher et al., 1994; Snowling & Hulme, 2011). These children need to be given reading intervention in all the sub skills of reading which includes alphabet knowledge, word recognition, phonics and fluency along with phonological awareness (National Reading Panel, 2000; Rack, Snowling and Olson, 1992; Ehri, et al., 2001; Hatcher et al., 2006; Blachman et al., 1999; Stuart, 1999).

There is a plethora of research evidence reported that early literacy interventions in alphabetic skills and phonological awareness develop reading acquisition of students at risk of dyslexia (Bradley & Bryant, 1983; Hatcher et al., 2004; Byrne, et al., 2000) and reduces their reading difficulties (Torgesen, et al., 1997; Vellutino et al., 2004; Foorman, et al., 1998; Whitehurst & Lonigan, 2001; Lonigan et al., 1998; Torgesen et al., 1999; Lovett et al., 2000; Molfese, Beswick, Molnar, & Jacobi-Vessels, 2006; Morris et al., 1998).

In brief, the right kind of reading intervention at the appropriate time, specially from pre-primary to primary grades reduces the reading impairments of students at risk of dyslexia as well as dyslexic students (Torgesen, 2002; Mathes et al., 2005; Fielding, Kerr, & Rosier, 2007; Scammacca, et al., 2007; Duff & Clarke, 2011). In this line of thinking, researchers emphasised the use of a multisensory approach integrated with
technology to teach early literacy skills to students with “at risk of dyslexia” and dyslexic students (National Reading Panel, 2000).

1.8 Concept of Reading at the Primary Level

Reading is a predominant skill for a student to acquire knowledge. Reading makes the students recognize and understanding the meaning. Meaning is acquired through decoding words or text. Hence, reading is the ability to pronounce the words and understand the meaning of the words in isolation and in sentences. In the process of learning to read, a learner needs to acquire knowledge of phoneme (Speech sounds), the smallest unit of reading. The student recognises a word through combination of many skills like alphabet knowledge, phonological awareness, and automatic recognition of words (sight words). Therefore, the early stage of learning to read focuses on developing decoding skills, phonological awareness and the alphabet knowledge of the students.

As reading is the focus of the study, certain models of reading play a pivotal role in identifying components of reading at the primary level. Moreover, it will open up possibilities for the researcher to develop a model to enhance reading performance of primary school students who are at risk of dyslexia. Hence, the researcher carefully identifies the suitable models of reading which could throw light on the selection of reading strategies, for which the following models of reading are conceptualized:

i) The Bottom-up Model

ii) The Top – Down Model

iii) The Interactive Model

The phases in the three models are presented in figure 1.F.5.
The Bottom-up Model

The bottom-up model emphasizes the recognition of words, and considers comprehension as information achieved exclusively from the text in which the focus is on linguistic clues that builds the literal comprehension of a text (Swaffar, 1991). In this reading process, the reader starts from the bottom that is, identification of letters, and ends up in understanding the meaning of the text. Gough and Tunmer (1986), LaBerge and Samuels (1985) are some of the proponents of the bottom-up model of reading. This model works on the basis of a phonics approach and stresses recognition of individual letters, phonemes and letter – sound association. Thus, it emphasizes the decoding skills and recognition of words. From this model point of view, mastery of the lower-level processing skills in reading is more important, such as letter-sound
relationships, single-letter sounds, consonants blends, and sight words. In this model the reader remains passive decoders. In brief, the goal of the bottom-up approach is to increase the rapid reading rate and the automatic word recognition of the reader. Then it is useful at the elementary levels of language instruction (Swaffar, 1991). To achieve this goal, explicit instruction in phonics and spellings are necessary (Grabe, 1991).

The Top – Down Model

The top- down model is a meaning driven process in which emphasis is on the background knowledge and use context prompting to comprehend the new concepts or words. Therefore, the goal of this model is constructing meaning from the text. Kenneth S. Goodman (1967) and Smith, et al. (1994) are some of the proponents of this model. This model starts with the whole word and ends with the letters and symbols of the alphabets. From this model’s point of view, reading is primarily meaning making through utilising the reader’s background knowledge in understanding the meaning of a given text by associating with his/her own experiences to construct meaning that are stored in their long term memory in the form of “schemata” and “scripts. In this model, the reader remains active encoders. Thus, it works on the principle of the whole language teaching approach.

The Interactive Model

This model is propounded due to the drawbacks that exist in the bottom-up and top- down models. The interactive model of reading is the combination of both the models which are simultaneously used during reading. The interactive reading model was developed by David E. Rumelhart in 1977. This model focuses on overall language skills related to letter and letter-sound correspondence (surface structure systems: grapho-phonie, lexical and syntactic) and prior knowledge, vocabulary, and sharing and applying meaning (deep structure systems: semantic, schematic and pragmatic). The terms grapho-phonie, lexical, syntactic, semantic, schematic and pragmatic mean letter-sound knowledge, word knowledge, structure of language, meaning; vocabulary knowledge, background knowledge and social construction of knowledge respectively. Thus, this model emphasises the interaction of various language skills involved in the reading process.
1.8.1 Methods of Teaching Reading in the Early Stages

Reading is a skill which has to be acquired and mastered. During the early stages of the learner’s academic phase, students need to be taught to learn to read the text, and in the later stages the learners are taught to read to learn information from the written material. There are various methods of teaching reading in the early stages of reading development. Some of the predominant methods are as follows:

Figure 1.F.6: Methods of Teaching Reading

The Alphabetic Method

It is a traditional method of teaching reading (Adams, 1990; McGuinness, 1997) tracing its origin from Greece and Rome. It is also referred to as spelling method or the ABC method. In this method, the students are taught the letter names of the alphabet both forwards and backwards in a sequential order through using the techniques of recitation, drill and repeated practice. It is then followed by teaching of consonant vowel blends and syllables (McGuinness, 1997). Later the students are trained to form words by putting the letters together after which pronunciation is taught. In this method, the students learn to read words by memorizing sequentially all the
combinations of consonant (C)–vowel (V) and vowel–consonant pronunciations. This method is useful for fixing the spelling of the words.

The Phonics Method

This method teaches the alphabetic principle, i.e., the sounds of the alphabets which help learners to establish the grapheme (letter)–phoneme (sound) correspondence. The essential component of this method is teaching the letter–sound association of alphabet or group of letters and their pronunciations (Adams, 1994). This method of teaching emerged during the early of 1500s in Europe. The grapheme–phoneme association is taught systematically in a sequence which includes long and short vowels, and consonants. Further, this method is classified into analytic and synthetic phonics method. The analytic phonics refers to breaking down known words into their individual sound–letter units and the letter sounds are taught after reading has begun. In contrast synthetic phonics refers to synthesizing the individual sounds into words and the letter sounds are taught before reading has begun. Phonological awareness and phonemic awareness are the elements of the phonics instruction. In this method, learners are taught to read unfamiliar words through utilizing decoding skills and analogy.

The Word Method

This method teaches the word as the unit of reading and not the letters as in the alphabet method. Another name for this method is “look–and–say method”. During the beginning of the middle 1800s, the word method of teaching reading was adopted throughout the English-speaking world (Adams, 1990; McGuinness, 1997). Later in 1930s, this method has emerged as a predominant method of teaching in the British and American classrooms. This method starts with the teaching of whole words and the words have to be recognized by sight. The sight words are taught by making use of flash cards with words or an illustrated picture with words.

The Sentence Method

The sentence method emerged as a new teaching method in the late 1800s, George L. Farnham, considered as a major proponent of the method, published the pamphlet in 1881 entitled “the Sentence Method”. This method is a further
improvement of the word method where the sentence is taken as the fundamental unit of expression. First the sentence is taught as a whole and later it is analyzed into words and letters.

1.9 Components of Reading with special reference to “At Risk of Dyslexia”

Many research studies emphasized the importance of teaching reading skills (Snow, Burns, & Griffin, 1998; Moats, 2000; Gambrell, Morrow, & Pressley, 2007) to the students with dyslexia and “at risk of dyslexia” in a systematic (Phillips et al., 2008), direct (Rupley, Blair & Nichols, 2009), and explicit way (Torgesen, 2004; Hurry and Sylva, 2007). Reading is a composite of many subskills namely alphabet knowledge, phonological awareness (Castles & Coltheart, 2004), word recognition, fluency and comprehension (Tankersley, 2003). Among these sub skills alphabet knowledge, phonological awareness (Torgesen, 1990; Chard & Dickson, 1999; Ehri, 2001) and Rapid Automatisition Naming (Kim, 2004; Bowers, 1995; Badian, 1993; Blachman, 1984) are the pre-requisite skills of attaining fluency in reading and reading comprehension. These sub skills are closely interrelated with the acquisition and mastery of learning to read and reading skills. The researchers observed that the phonological awareness (Torgesen et al., 1999; Adams, 1990; Torgesen, 2004; Carroll, & Snowling, 2004), alphabet knowledge (Byrne, & Fielding-Barnsley, 1989; Blaiklock, 2004) and RAN (Schatschneider et al. 2004; Badian, 1997; Hulslander et al., 2004; Pennington & Lefly 2001; Wolf & Bowers, 1997) are important prerequisite skills for learning to read as well as predictors to identify “at risk of dyslexia” in the early stages of reading. Under this section, these sub skills of reading are discussed in connection with the teaching of reading to the dyslexics and “at risk of dyslexia”.

1.9.1 Phonological Awareness

The term phonological awareness refers to the ability to attend, understand and make judgments about the general sound structure of a language. The concept of phonological awareness emerged in the beginning of 1960s, and two psychologists from Russia, Elkonin and Zhurova are considered the proponent founders of the concept of phonological awareness.
Phonological awareness is categorized into several sub skills like sentence awareness, rhyme awareness, alliteration, onset and rime awareness, syllabic awareness and phonemic awareness which develop in a continuum from simple, shallow-level phonological awareness to complex, deep-level phonological awareness (Wagner & Torgesen, 1987; Wagner, Torgesen, Laughon, Simmons, & Rashotte, 1993; Ball & Blachman, 1991 Justice & Schuele, 2004; Torgesen, Morgan, & Davis, 1992; Anthony & Lonigan, 2004).

Figure 1.F.7: Levels of Phonological Awareness

The figure 1.F.7 shows the sequence of phonological awareness skills from less complexity to more complexity. Phonological awareness refers to the ability to focus on the sound of speech as distinct from its meaning. Phonemic awareness is a sub set of phonological awareness and it is the most important phonological element for the development of reading. Phonemic awareness includes onset rime segmentation, identification of initial and final sounds, blending of sounds into words, segmenting words into sounds and manipulation of the phonemes.
1.9.1.1 Phonological Core of Reading Disability

There is a plethora of evidence available in this area of relevant literature that the phonological awareness components have a strong link in the development of reading performance of dyslexics and the core deficit in reading disability is at the level of phonological awareness (Stanovich, 1993; Stanovich & Siegel, 1994; Fletcher et al., 1994; Scanlon & Vellutino, 1997; Torgesen, Wagner, & Rashotte, 1997; Morris et al., 1998; Foorman et al., 1997; Shaywitz et al., 1999; Shaywitz 2003; Ehri et al., 2001; Vellutino, Fletcher, Snowling, & Scanlon, 2004). Many research studies demonstrated a strong link between phonological awareness and reading development (Liberman et al., 1974; Perfetti, Beck, Bell, & Hughes, 1987; Ehri et al., 2001; Ramus et al., 2003; Archer, Gleason, & Vachon, 2003; Ehri & Wilce, 1980, 1985; Lyon, Shaywitz, & Shaywitz, 2003) and also the strongest indicators of risk Status of dyslexics (Byrne & Fielding-Barnsley, 1993; Badian, 1994; Davis et al., 2001; Christensen, 2000; Gayan & Olson, 2005; Snowling 2005; Puolakanaho et al., 2007). Where most researchers and practitioners proved that the phonological deficits are the core deficits of dyslexia (Adams, 1990; Bradley & Bryant, 1983; Calfee et al., 1973; Catts, 1989; Liberman & Shankweiler, 1985; Lyon, Shaywitz, & Shaywitz, 2003; Muter, Hulme & Snowling 1997; Wagner & Torgesen, 1987) and must be an important component in the reading instruction. Researchers namely Foorman (2003), Uhry & Clark (2004), and Torgesen (1995) stated that it is difficult to imagine any research work carried out in the field of dyslexia, not referring to the role of phonological awareness in the identification process and intervention programme designed for the dyslexics to enhance their reading performance and literary skills.

Research studies in the past three decades have focused on the contribution of phonological awareness for the development of reading acquisition of the normal and dyslexic learners (Goswami, 2003; Valerie Muter & Kay Diethelm, 2001; Fletcher, et.al., 2002). Torgesen’s is a pioneer who explored the connection between phonological awareness and reading. He conducted extensive research in this area and published his study entitled “The Nature of Phonological Process and its Causal Role in the Acquisition of Reading Skills” in which the vital role of phonological awareness was discussed elaborately. According to Torgesen “…perhaps the most important single conclusion about reading disabilities is that they are most commonly caused by
weaknesses in the ability to process the phonological features of language” (Torgesen et al., 1999, p. 579). During the late 1980s and early 1990s, the impact of Torgesen’s research studies influenced the field of dyslexia and reading intervention (Catts, Fey, Zhang, & Tomblin, 1999). These research studies indicated that the explicit instruction in letter – sound association reinforces the development of phonological awareness; specially it helps to develop the deeper level of phonological awareness that is phonemic awareness (Snow, Burns, & Griffin, 1998).

In addition to that, the role of phonological awareness in developing reading acquisition in various languages was also studied. Numerous research studies have established the strong relationship between phonological awareness and learning to read in different languages too (Fox & Routh, 1976; Bradley and Bryant, 1983 & 1985; Stanovich, 1986; Wagner, & Torgesen, 1987; Hulme et al., 2002; Perfetti, Beck, Bell, & Hughes, 1987; Tunmer & Rohl, 1991; Tunmer, & Rohl, 1991; Olson, Wise, Ring, & Johnson, 1997; O’Connor, Jenkins, Leicester, & Slocum, 1993; Wagner et al., 1994, 1997; Badian, 1998; Muter, Hulme, Snowling, and Taylor, 1998; National Reading Panel, 2000). From these research studies, it is evident that the phonological awareness is a predominant skill for reading acquisition not only in English but also in other languages too. Other research studies have suggested that reading instruction in the phonological awareness improves the reading performance of the learners (Bradley & Bryant, 1983; Olofsson, & Lundberg, 1985; Vellutino, & Scanlon, 1987; Vandervelden, & Siegel, 1997; Lundberg, Frost, & Petersen, 1988; Ball, & Blachman, 1991; Torgesen, Wagner, & Rashotte, 1994; Torgesen, 1997; Torgesen, et al. 1999; Caravolas, Hulme, and Snowling, 2001). For example, Chaney states that “…providing training in phonological awareness results in improved reading scores, leading researchers to conclude that the relationship between phonological awareness and reading is a causal one”. (Chaney, 1998, p. 433). The recent research findings (Cassady, Smith, & Putman, 2008; Passenger, Stuart & Terrell, 2000; Al Otaiba, Connor, Lane, Kosanovic, Schatschneider, Dyrlund, & Wright, 2008) continue to reinforce the findings of the studies that there is a significant relationship exists between the phonological awareness and learning to read.
Therefore, from these studies it is evident for the present research that knowledge in phonological awareness is one of the crucial components of reading instruction for all types of learners which include normal readers as well as dyslexic readers.

1.9.2 Alphabet Knowledge

Alphabet knowledge is one of the fundamental skills in learning to read and it has a strong association with the development of reading acquisition. Mason (1984) defined it as the “ability to name, distinguish shapes, write, and identify the sounds of the alphabet”. Research studies have stated that alphabet knowledge is one of the best single predictors of early reading achievement (Stevenson & Newman, 1986; Adams, 1990). Not only that, but it also facilitates the development of phonological awareness. Thus, the term alphabet knowledge refers to the recognition of grapheme-phoneme associations. The elements of alphabet knowledge involve letter shape recognition, letter-name knowledge, letter-sound knowledge and rapid-letter naming. Research studies in this area have stated that without acquiring the skill of alphabet knowledge, it is impossible for learners to develop their reading skill (Young-Suk, et al., 2010; Bradley & Stahl, 2001; Whitehurst & Lonigan, 2003). This statement has been supported by the research studies conducted to find out the association between alphabet knowledge and reading acquisition (Lonigan, Burgess, and Anthony, 2000).

Figure 1.F.8: Alphabet Knowledge for Learning to Read

![Alphabet Knowledge Diagram](image-url)
Research studies demonstrated that letter-sound correspondence was a prerequisite skill for effective word identification (Juel, 1991). Reading instruction which combines both alphabet knowledge and phonological awareness enhances the word recognition and sight word reading (Ehri, 2005). This was confirmed by the report of the National Reading Panel (2000): that early literacy instruction should have the core component of alphabet knowledge, in addition to which training in phonological awareness is also included (Adams, 1990; Ball & Blachman, 1991; Molfese et al., 2006; Bell & Westberg, 2009). Hence, the training in these two skills reduces the reading difficulties of “at risk of dyslexia” (Gillon 2000, 2005).

In brief, the rich foundation in the alphabet knowledge and phonological awareness skills facilitate the success in learning to read during their elementary school years. Finally, letter recognition is known to facilitate the development of word recognition skill (Ehri, 2003).

1.9.3 Word Recognition

For the beginner readers, word recognition is considered as one of the basic skills to be acquired during the process of reading acquisition (Adams, 1990; Barron, 1986; Byrne, 1998; Kurvers & Van der Zouw, 1990; Ziegler & Goswami, 2006). The terminologies word recognition, word identification and decoding are used interchangeably. It refers to the "the process of determining the pronunciation and some degree of meaning of an unknown word" (The new Literacy Dictionary -Harris & Hodges, 1995, pp. 282-283). But there was a difference between the two terms; McCormick (2003) states that word recognition is the instantaneous recall of words or reading of words by sight and word identification refers the reading of words by the readers through using different strategies to pronounce a word such as decoding, phonics, analogy, etc.. In a simple way it is defined as the pronunciation of the word and to some extent getting the meaning of the word.

Research studies have demonstrated that individuals with reading difficulties and at risk of dyslexia exhibit difficulties in word recognition (Nation et al., 2004; Catts et al., 2003; Shankweiler et al., 1999). Word recognition helps to attain fluency which in turn, enhances comprehension skill. Therefore, the students who have poor word
recognition tend to have problems in attaining fluency and comprehension which ultimately results in reading impairment. In order to understand the problems of acquiring the word recognition skills of an individual, the phases of learning to read words needs to be understood.

1.9.3.1 MODEL OF PHASES OF LEARNING TO READ

Linnea Ehri and McCormick (1998) have developed a model of phases of learning to read words which describes how a learner learns to read words (Ehri, 1999). The model of phases of learning to read describes about how students learn to read words (Ehri, 1999) and the reader’s knowledge and use of the alphabetic code. The alphabetic code refers to the use of alphabet knowledge, relationship between letter – sound and phonemic awareness in learning to read (Ehri & McCormick, 1998). Phonemic awareness is the ability to focus on and manipulate phonemes in the spoken word (Ehri, Nunes, Willows, & Schuster, 2001). The model consists of four phases namely, Pre-Alphabetic Phase, Partial-Alphabetic Phase, Full Alphabetic Phase, and Consolidated- Alphabetic and the Automatic Phase. The description of these phases is described in Figure 1.F.9.

Figure 1.F.9: Phases of Learning to Read
Pre-alphabetic phase: In this stage the learners have little knowledge about letter – sound association. So they learn to read the words through remembering visual clues from the context, memorizing their visual features or guessing words from their context and from memory (Gough et al. 1992).

Partial-alphabetic phase: During this phase, an individual learns to read through recognizing some letters of the alphabet and uses them together with context to remember words by sight. In this, the person has an elementary knowledge of the alphabetic principle, letter – sound association and uses letters (usually initial letters) and context to guess unfamiliar words.

Full-alphabetic phase: During this phase, a reader is set to learn the grapho-phonemic system, sound-symbol correspondences and will use that knowledge to decode unfamiliar words. The reader will also use analogy to read the words because sufficient sight words are stored in the memory and the initial stage of this phase reading is slow and laborious.

Consolidated and automatic alphabetic phase: In this phase the reader is set to attain full working knowledge of alphabet, letter – sound association and the spelling rules. During this stage the reader develops the ability to store longer words through making use of chunking techniques and recognizes the words automatically by sight, and is skilled in applying different strategies to read unfamiliar words.

1.9.3.2 Word Recognition Strategies

The National Reading Panel (2000) and Ehri (2004, 2005) have found out the word recognition strategies used by the readers to read familiar and unfamiliar words. Readers use one or more strategies to read words. The predominant strategies are:

a) Decoding: The phonics; that is the letter – sound correspondence are used to sound out letters and blended together to pronounce a word (Morrow & Morgan, 2006).

b) Sight recognition: It refers to any word that is immediately recognized as a whole, is a sight word. Words are recognized by sight from memory without analysis; these words are referred as high frequency words (Ehri, 2005) which are frequently used in spoken and written language and were retrieved from memory.
c) **Analogy**: It involves using familiar words or part of words to identify the unfamiliar words (Barone, Hardman, & Taylor, 2006). For example a reader knows the sound of “w” in wall, and the word bake, through analogy the reader identifies the new or unfamiliar word “wake”. But there are some prerequisite skills are needed to use the analogy strategy to recognize words. Those prerequisite skills (White, 2005; Zimmerman et al. 2008) are knowledge of decoding, alphabetic principal, rhyme recognition, onset and rime knowledge and ability to identify initial phonemes (sounds).

d) **Prediction**: Contextual clues are used to identify an unfamiliar word. This may be an use of word structure that refers to prefixes, root words, suffixes and syllable, word parts refers to letter groupings to identify the word and using the meaning based clues in the printed text like words in the sentence, syntax and pictures.

1.9.3.3 **Milestones of Sight Words for Word Recognition**

Sight words are words which have to be read by the readers instantly on seeing the words in the text. These words are read from the learner’s memory due to the frequent use of the words. In 1936, Edward William Dolch one of the proponents of the "whole-word" method compiled a 220 basic sight vocabulary first published in the Elementary School Journal (Dolch, 1936) entitled “A Basic Sight Word Vocabulary” which is made up of pronouns, verbs, adverbs, adjectives, prepositions and conjunctions. In that article, he included a set of 220 basic words to assist teachers select words for “drilling on sight words that will be of most value to . . . children in their reading” (Dolch, 1936, p. 436). Later, in 1948, he published these basic sight words in his book entitled “Problems in Reading”. Initially, Dolch referred to these sight words as “tool words” (Dolch, 1936) and later called them “service words” (Dolch, 1941). Hence, the words that are recognized automatically are termed “sight words” and are defined “as words that are immediately recognized as a whole and do not require analysis for identification” (Ehri, 2000). Sight words have to be recognized immediately to achieve reading fluency. Thus the role of sight words is inevitable in acquiring reading fluency because Sight words make up 50 to 70 percent of any general text. “Beginning readers need to master a basic sight vocabulary of common words . . .
as any child or adult whose reading ability ranges from none to upper third grade” (Fry, 1984).

A number of research studies are for the importance of learning sight words to attain fluency in reading (Dolch, 1941; Carroll, Davies, and Richman, 1971). Therefore, teaching sight words is a crucial component of teaching reading in early elementary education. Some of the researchers demonstrated that alphabet knowledge and phonological awareness enhance the acquisition of sight words (Ehri, 1992; LaBerge & Samuels, 1974; Stuart, 2000). The process involved in sight word learning is referred to as a connection-forming process (Perfetti, 1992; Ehri, 1992; Rack, Hulme, Snowling, & Wightman, 1994).

Other empirical studies in this area stated that poor readers and students with dyslexia have difficulty with sight-word reading (Ehri & Saltmarsh, 1995). Obviously, it is evident that reading intervention programme for dyslexics should include sight words teaching as one of the components to attain fluency in reading words and passage (Zoe Watts and Paul Gardner, 2013; Meree Reynolds, Kevin Wheldall & Alison Madelaine, 2011). Whereas the effective use of word-recognition strategies facilitates the readers to instantly and automatically translate the letters or spelling patterns of printed words into speech sounds so that they can recognize words and attain rapid access to their meanings (Vandervelden & Siegel, 1997). So the readers must learn to recognize words rapidly and smoothly so that they can focus on the meaning of what they are reading (Stanovich, 1986).

From the review of relevant literature, it is found that various of techniques were utilized to teach these sight words such as flash cards, drill and practice, visual clues (pictures), word walls, games or word cards, word family approach, repetition and multisensory techniques, sentence strip highlighting the word, look–say, whole-word method of teaching reading, etc,. Basic sight words lists include words as: the, and, you, was, with, they, have, in, on.

1.9.4 Rapid Automatic Naming (RAN)

Another important component that has an association with reading acquisition is the Rapid Automatic Naming (RAN) said to be related to reading achievement. RAN is
defined as “the ability to name, as quickly as possible, visually presented familiar symbols such as digits, letters, colors, and objects” (Denckla, 1972). A wide range of research has documented that RAN has a strong association with reading development, more specifically on the development of fluency in reading (Wagner & Torgesen, 1987; Bowers & Wolf, 1993; Scarborough, 1998; Fletcher, Francis, Carlson, & Foorman, 2004; Cardoso-Martins & Pennington, 2004; Powell, Staintorp, Stuart, Garwood, & Quinlan, 2007; Georgiou, Torppa, Manolitsis, Lyytinen, & Parrila, 2012).

In the 1960s, Norman Geschwind, neurologist with Rita Rudel and Denckla developed the three different versions of the RAN test using objects, numbers and letters as stimuli. They coined the term “rapid automatized naming” to describe these tasks that were intended to measure the speed of naming familiar items, where the children are required to name a series of forty to fifty known items, such as digits, letters, colours, or pictured objects, as quickly as possible (Wagner & Torgesen, 1987; Denckla & Rudel, 1976).

Research studies reveal that the connection between RAN and Fluency is well established in the field of reading development and children with dyslexia have core deficits in RAN tasks (Wolf et al. 1986; Meyer et al. 1998). The important point to note is that the RAN task is used to identify At Risk Dyslexics (Simpson, Everatt, & Cheney, 2001), identifying subtypes of dyslexic readers (Bowers, 1995; Wolf & Bowers, 1997), and assist in differentiating good readers from poor readers (Badian, Duffy, Als, & McAnulty, 1991; Felton, Naylor, & Wood, 1990; Cornwall, 1992).

In addition to this, the association between RAN and reading development is studied in many languages namely Chinese, Finnish, Arabic, Hebrew, Italian, Japanese, Portuguese, French, German, etc., In all these languages a strong relationship is established between RAN and reading development that RAN predicts, reading success in later years and as an early indicator to identify children with dyslexia and at risk dyslexia (Scarborough 1998; Tan et al. 2005; Georgiou et al. 2008; Pennington & Lefly 2001; Ziegler et al. 2003; Schatschneider et al. 2004; Torppa et al. 2010; Ramus et al. 2011; Vaessen et al. 2010).
In a nutshell, RAN and phonological awareness are the strong predictors of the reading ability of an individual in the later stages of reading development as well as early predictors to determine students with dyslexia and at risk dyslexia. It can be used as a part of an educational and clinical assessment to identify at risk of dyslexia and students with specific learning disabilities (Wolf & Denckla 2005).

1.9.5 Reading Fluency

Reading fluency refers to the reader’s ability to read effortlessly with accuracy, speed, automaticity, and expression. Researchers emphasises that the reading fluency skill is essential to increase the reading rate to translate the text into spoken language (Torgesen, Rashotte, Alexander, Alexander, & MacPhee, 2003; Shaywitz, 2003). The National Reading Panel (2000) defined reading fluency as "the ability to read text quickly, accurately, and with proper expression". Fluent readers have the ability to read at least seventy-five to one hundred words per minute accurately in a grade-level passage text with three to five errors (Shinn, 1989).

Reading fluency gained the attention of the researchers during 19th century with the work of William MacKeen Cattell (1886), a 19th-century experimental psychologist and Edmond Huey (1908/1968), and later LaBerge and Samuels (1974). Cattell (1886) found that the readers tend to name the letters and words faster than the symbolic categories namely pictured objects and colours.

There are varied definitions quoted in the relevant literature for fluency. LaBerge and Samuels (1974) and Carver (1997), defined it as “level of reading competence at which textual material can be effortlessly, smoothly, and automatically understood” (Schreiber, 1980, p. 177). Another definition by Meyer and Felton (1999), defined fluency as “the ability to read connected text rapidly, smoothly, effortlessly, and automatically with little conscious attention to the mechanics of reading such as decoding” (p. 284).

From these definitions it is observed that fluency in reading means the reader's capacity to read the text in a smooth, effortless and automatic way. There are three important components which affect the reading fluency of the reader, such as accurate
word recognition, automaticity and appropriate rhythm and intonation of speech (McKenna & Stahl, 2009).

Fluency is an important component of reading acquisition but in the early periods of reading researchers neglected the element of fluency in the reading intervention programmes. In 1983 and 1997, Allington, Lyon and Moats emphasised the importance of including reading fluency training in reading instruction and they stated that fluency is a “most neglected” reading skill (Allington, 1983) and there is a need to refocus on the reading intervention to incorporate fluency as an element in the training programme because development in decoding and word-reading accuracy can be achieved easily when compared to enhancement in reading fluency and automaticity of the reader.

In the current scenario, the researchers are turning their attention to develop reading fluency among normal readers as well as dyslexic readers. Researchers have developed reading intervention which includes both the components; phonological awareness and reading fluency to improve the reading skills of the learners (Breznitz & Share, 1992; Young & Bowers, 1995; Torgesen, Rashotte, & Wagner, 1997; Torgesen et al., 1999; Wolf & Bowers, 2000).

1.9.5.1 Strategies to develop Reading Fluency

The National Reading Panel Report (2000) emphasised the training in reading instructions for all types of readers i.e. students with dyslexia and normal readers. There are many techniques to develop reading fluency among learners. Some of the important techniques are neurological impress (Heckelman, 1969), repeated oral reading practice (Samuels, 1979), paired reading (Topping, 1987), radio reading (Greene, 1979), choral reading, pointed reading, echo reading, Cross - age buddy reading, recording - assisted reading and timed repeated reading and charting. The predominant strategies which are used in the reading instruction are discussed in Figure 1.F.10.
Repeated Oral Reading: This is one of the oldest and most widely used techniques which was first described by Dahl (1974) and named by Samuels (1985) to increase the reading rate (reading words per minute calculated) of the reader for a given material. The teacher or the instructor reads aloud the passage first and provides a model reading which the student follows carefully and then re-reads the same passage with the assistance of the teacher.

Partner reading, or buddy reading: The strong reader is paired with the struggling reader from the peer group. At first, a strong reader reads the passage aloud which is carefully followed by a struggling reader. Then, the struggling reader rereads the exact passage with the help of strong reader.

Choral reading: This technique is most often used in the general classroom setting where everybody reads the passage together. The teacher demonstrates the model reading and the students carefully listen to the model reading and follow the text when it is read by the teacher. Then it is followed by the students’ chorus reading.

Echo reading: In echo reading, the teacher reads a small portion of text aloud which may be a single sentence in a passage or a paragraph or a line from a poem. After the
teacher’s reading of the short section of the text, it is instantly followed by the students’ reading. This technique can be used with whole classroom of students or just with an individual reader.

**Recording - assisted reading:** The text is recorded in a tape or CD by a fluent reader. The student hears the recorded text many times and then reads along with the recorded text and practices the material several times till fluency is achieved.

**Timed repeated reading and charting:** This technique is a time bound reading practice. The student reads a short text for a minute and then the teacher records the reading rate of the student and marks the student score in a graph. The reading practice continues repeated till the student achieves the desired level of reading.

**The Neurological Impress:** This technique was developed and extensively researched by Heckelman during the 1960’s. It is also a paired reading technique where the teacher and the students read the same passage together sitting side-by-side, the teacher reads the passage to the ears of the student in a slow and low tone together so that the student follows the reading with his / her finger on the text and reads along with the teacher. Reading along with a more fluent reader is thought of as "an impress, an etching in of word memories on the natural process" (Heckelman, 1969). This technique develops the student’s self-confidence due to the positive reinforcement and the support received from the teacher.

In addition to these techniques there are a plethora of other techniques available in the relevant literature. But among these techniques, repeated reading and the neurological impress were predominantly used techniques to teach the students with dyslexia and at risk dyslexia. The National Reading Panel (2000) stated that the neurological impress method and the repeated reading technique are the most popular and effective strategies to develop the reading fluency for the normal and individuals with reading disabilities. Research evidence is also available to substantiate the statement: Nelson, Alber and Gordy (2004), Wolf and Katzir-Cohen (2001), Chafouleas, Martens, Dobson, Weinstein and Gardner (2004), Therrein (2004) and Alber, Ramp, Martin and Anderson (2005) all proclaimed that repeated reading technique as an evidence based strategy to teach reading fluency for individuals with
reading disabilities and at risk dyslexics. Similarly, Hecke
lman (1986), Learning Disabilities Association of Amer
cia (1998), Feazell (2004), Flood, Lapp and Fisher (2005) and
Barden (2009) were also reported that the neurological impress
strategy is an efficient and scientifically tested strategy to teach
reading fluency for students with reading disabilities.

Dyslexics and students at risk of dyslexia have notable dif
culties in acquiring reading fluency. Their reading of the iso
lated words and passage tends to be slow and laboured, and
they struggle to pronounce almost each and every word to
pronounce (Meyer & Felton, 1999). Dyslexic students have
difficulties in reading fluency and their common problem lies
in the inability to decode words, read sight words, and read
phrases and sentences instantly and automatically (Chard et al.,
2002). Research studies revealed that reading intervention
concentrates on fluency and comprehension given at the
third grade for the students with dyslexia and at risk of dyslexia
to improve their reading performance (Vaughn, Gersten &

1.9.5.2 Steps involved in instructional strategies to teach
reading fluency

Teaching reading fluency is one of the crucial components in
the reading instructional programme for struggling readers
who are dyslexics and at risk dyslexics to enhance their
reading performance. The steps involved in teaching reading
fluency are as follows:

- Developing the letter- sound association for fluency which includes letter
  familiarity, phonics and phonological awareness.
- Developing vocabulary and oral language skills.
- Teaching of sight words and word recognition techniques
- Teaching word patterns and spelling patterns.
- Demonstrating model reading, reading practice and providing opportunity
to apply the decoding strategy.
- Using appropriate grade level texts to build reading rate of the reader.
- Using repeated reading technique.
- Assessment of reading fluency through appropriate test procedures.
In brief, fluency is one of the essential components in the reading programme for all types of readers. As a consequence, fluency facilitates comprehension of the written text. So it has a strong association with the improvement of reading comprehension (Fuchs, Fuchs, & Maxwell, 1988; Anderson, Wilkinson, & Mason, 1991; Jenkins, Fuchs, Espin, van den Broek, & Deno, 2000; Vaughn et al., 2000; Flood, Lapp and Fisher, 2005; Vaughn, Gersten & Chard 2000; Young, 2011; Klauda and Gutherie, 2008).

1.9.6 Reading Comprehension

The term reading comprehension refers to the understanding of meaning from the written text. The ultimate goal of reading competency is comprehension of the words in isolation, sentences and passage from the text (Sadoski, 1982; Gambrell, Block, & Pressley, 2002). According to the Simple view of Reading (Gough & Tunmer, 1986; Tunmer & Hoover, 1992), reading is defined as a combination of decoding and comprehension. Thus, researches have stated that decoding is one of the prerequisite skills which help to develop the reading comprehension of the individuals (Stanovich, 1980; Perfetti, 1985). Reading comprehension is the highest skill in the development of reading acquisition (Van Orden, 1991). Therefore it can be developed only after mastering all the prerequisite skills of reading like decoding ability (Cain, Oakhill and Bryant, 2004), word recognition ability, vocabulary knowledge (Storch & Whitehurst, 2002; Muter, Hulme, Snowling, & Stevenson, 2004; Wagner, 2005; Braze et al., 2007) and fluency (Allington, 1983). There are three levels in reading comprehension proposed by William S. Gray (1960) by namely i) the literal level, ii) the inferential or interpretive level, and iii) the critical, applied, or appreciative level which means reading the lines, reading between the lines, and reading beyond the lines respectively.

There is a wealth of related literature in the area of dyslexia which stated that students with dyslexia and struggling readers have difficulties in reading comprehension (Litcher & Roberge, 1979; Cain, 2010; Gersten, Fuchs, Williams, & Baker, 2001). So these students need to be provided appropriate intervention that focuses on the development of reading comprehension (Oakland et al, 1998). Therefore, before teaching reading comprehension to these students, the prerequisite
reading skills for learning to read should be taught to them through direct, explicit and structured reading intervention and then followed by the intervention in reading comprehension after achieving the fundamental skills for learning to read (Nation, 2005; Pressley 1998; Juel 1998; Storch & Whitehurst, 2002; Chapman and Tunmer 2003; National Reading Panel, 2000). To support this point, Oakland et al, (1998) stated that “Reading comprehension intervention begins after decoding skills have reached a minimal level of accuracy and automaticity”. From these two statements, it is definite that the students with dyslexia and at risk dyslexics first shall be taught to learn to read the text before developing their reading comprehension ability.

1.10 Reading Intervention for Students with Dyslexia and At Risk Dyslexia

Learning to read is the predominant difficulty for students with dyslexia and at risk of dyslexia. Reading intervention helps to reduce the reading difficulties of these children. The former president of Orton Dyslexia Society now renamed, the International Dyslexia Association (IDA). Margaret Byrd Rawson (1960) emphasized the acute need for different reading instructional strategies for dyslexics: “Dyslexic students need a different approach to learning language from that employed in most classrooms. They need to be taught, slowly and thoroughly, the basic elements of their language—the sounds and the letters which represent them—and how to put these together and take them apart. They have to have lots of practice in having their writing hands, eyes, ears, and voices working together for conscious organization and retention of their learning.” In line with this many research studies have also emphasised the need for explicit reading instruction (Vellutino, 1991: Rayner, Foorman, Perfetti, Pesetsky, & Seidenberg, 2002; Snow, Burns, & Griffin, 1998; Torgesen, et al., 2001) for these struggling readers in the areas of phonological awareness (Fletcher, et.al., 2002; Goswami & Bryant, 1990), alphabet knowledge (Cox, 1985; Joshi et al., 2002) and fluency (Vaughn, Gersten, & Chard, 2000; Swanson, Hoskyn, & Lee, 1999) through the multisensory approach (Foorman et al., 1997; Falzon, 2010). Thus, the need for such a systematic (Torgesen et al., 2001; Torgesen, 2005; Scammacca et al., 2007; Roberts, Torgesen, Boardman & Scammacca, 2008) and structured (Oakland, Black, Stanford, Nussbaum & Balise 1998; Traub & Bloom 2000) reading intervention has also been stressed by the National Reading Panel Report (2000).
In addition to this, the National Reading Panel (2000) has reported the necessary components which are an integral part of the reading instruction to develop the reading acquisition of all types of readers such as normal readers as well as struggling readers and dyslexics. The five pillars of reading instruction is schematically represented in Figure 1.F.11.

**Figure 1.F.11: Components of Reading Intervention**

![Diagram of Five Pillars of Reading Instruction](image)

The descriptions of these components (mentioned in Figure 1.F.11) were already discussed in this chapter earlier. There are many approaches available in the relevant literature to these reading skills. But undoubtedly, the multisensory approach is one of the best approaches to teach reading skills (National Reading Panel, 2000). There is a convergence of evidence to substantiate its significance (Oakland, et al. 1998; Joshi, Dahlgren & Baulware-Godden, 2002). As a consequence, multisensory approach is a research proven and evidence based method to develop reading acquisition for all types of learners including students with dyslexia and at risk dyslexia (Stahl, 2006).
In line with the above evidence, researchers namely Catts (1991), Daloiiso (2007) and Costenaro (2011) have proposed a dyslexic-oriented reading intervention model for reading acquisition. The considerations of the model are:

**Short:** The reading intervention programme should not be more than one hour per day to avoid overloading of cognitive information.

**Flexible:** The reading intervention programme has to be flexible and adaptable based on the needs of the learners. This in turn will assist the children with dyslexia to integrate the learning input into a more adaptable and broader learning context.

**Systematic:** The reading intervention has to be sequentially organized in a logical order teaching starting from easier skills to more difficult skills. For example, teaching from rhyming awareness to phoneme awareness.

**Direct:** It stresses the teacher student interaction in the teaching-learning process. In this process the children’s everyday experiences are incorporated in the teaching material which facilitates the student’s active participation.

**Explicit:** It should assist and provide guidance to the readers in their learning process through providing immediate corrective feedback and reinforcement to the learners.

**Multi-sensory:** The reading intervention for struggling readers should provided inputs through multisensory modality (National Reading Panel, 2000) which presents learning experiences through all senses, visual (see), auditory (hear), kinaesthetic (doing), and tactile (touch). This method is commonly referred as VAKT method.

### 1.11 Backdrop of Multisensory Approach

The multisensory approach utilizes all the senses of the learner which includes visual, auditory, kinaesthetic and tactile in the teaching learning process (Gillingham & Stillman, 1997). This approach was developed by Samuel T. Orton, called the “father of dyslexia” (Colony, 2001) along with his two colleagues, Anna Gillingham, an educator and psychologist and Bessie Stillman during the 1930s. This approach has its roots in the works of Hellen Keller and Grace Fernald who used kinaesthetic modality
to reinforce the inputs gained through visual and auditory associations. For example, the learner starts learning the sounds of an individual letter, first sees letters in the print form (visual). Second he/she hears the sounds of the letter (auditory), third he/she feels it when the sounds are produced (tactile sensations in the mouth) and finally he/she makes use of his/ her whole body to make the letter (large muscle movements) (Gillingham & Stillman, 1997).

Orton is considered as a pioneer in developing reading remedial instructions and principles for teaching the students with dyslexia and at risk dyslexia in the 1930s. Later, based on the works of Orton, in 1946, Anna Gillingham and Bessie Stillman wrote a manual for teachers on how to teach and develop reading and spelling skills of students with Specific Learning disabilities. They both together published a manual called “The Gillingham Manual: Remedial Training for Children with Specific Disability in Reading, Spelling, and Penmanship”. This method of teaching is popularly known as “The Orton-Gillingham (O-G) Multisensory Structured Language Approach” which formed the basis for numerous current multisensory methods (Richardson, 2001). During 1930s this method of teaching was considered the first of its kind to teach the dyslexics to read through implementing the multi-senses, visual/auditory, kinaesthetic and tactile (VAKT) approach. The advantage of this approach is that it can be used with all types of learners at any levels and the instruction may be given to an individual, small or big group.

The International Multisensory Structured Language Education Council (IMSLEC, 2001) has published the principles of multisensory instruction to teach reading for students with dyslexia and ways to improve foreign language learners from information adapted from "Clinical Studies of Multisensory Structured Language Education for Students with Dyslexia and Related Disorders". These principles were also adapted by the International dyslexia Association to teach the dyslexics. The principles of the reading programme are described below:
Simultaneous and Multisensory: All learning channels such as visual, auditory and kinaesthetic-tactile are used together side-by-side to improve the memory and learning of the learner.

Systematic and Cumulative: The presentation of language learning materials should follow the logical sequential order starting from simple to complex and easy to more difficult material. The learning concepts should be taught systematically based on the learner’s previous knowledge and integrated in teaching the new concept, and then the already learned concepts and rules are constantly reinforced to facilitate for assisting the learners to store it in their long term memory.

Direct Instruction: All the concepts of language and its rules are taught directly to the learners through continual interaction between the student and teacher till the learner attains a considerable level of proficiency in the language skills.

Diagnostic Teaching: The teaching of the content is based on the student’s need and progress which is continuously assessed before, during and after teaching to find out the areas of difficulty in learning and to ensure the mastery of the content by the learner.

Synthetic and Analytic Instruction: The multisensory reading intervention should utilize both analytic and synthetic instruction. In the analytic phonics approach, the students are taught to break the whole into different parts of the language components (word to phonemes); it works on the principle of the whole to parts. On the contrary, in synthetic phonics approach students are taught to synthesize the parts of the language components (phonemes to word), it works on the principle of parts to whole.

Comprehensive and Inclusive: all components of the language are taught to the struggling readers through the reading remediation instruction which includes graphemes (symbols), phonemes (sounds), morphemes (smallest grammatical units/meaningful word parts), semantics (meanings), syntax (principles of sentence construction), discourse (longer passage), and pragmatics (social uses of language).
1.11.1 Content of the Multisensory Structured Language Intervention

The International Multisensory Structured Language Education Council (IMSLEC, 2001) documented the contents that have to be included in the multisensory language instruction for the effective reading remediation to teach reading to students with dyslexia. The International Dyslexia Association (IDA) has also followed the same content prescribed by IMSLEC to teach dyslexics in the clinical and educational settings. The contents of the multisensory language instruction of literacy components are phonology and phonological awareness, grapheme-phoneme association, syllable awareness, morphology, syntax, and semantics.

Research Supports for Multisensory Intervention

There is ample research evidence in relevant literature which documents the effectiveness of multisensory teaching to teach struggling readers. The National Institute of Child Health and Human Development (NICHD) stated that reading instruction presented in a structured, sequential, multisensory approach that includes the prescribed contents enhances the reading performance of the students with dyslexia. To support this statement, there are number of researchers who have investigated the effectiveness of the multisensory language teaching approach (Jeyasekaran, 2015; Torgesen, Wagner, & Rashotte, 1997; Foorman et al., 1997; Oakland, Black, Stanford, Nussbaum, & Balise, 1998; Joshi, Dahlgren, & Bouhleware- Gooden, 2002; Shaywitz et al., 2004) to teach the dyslexics (Ball & Blachman, 1991; Hatcher et al., 2004; Slingerland, 1977; Oakland, Black, Stanford, Nussbaum, and Balise, 1998; Moats & Farrell, 1999; Daly, Chafouleas & Skinner, 2005) and at risk dyslexics (Dickinson & Tabors, 1991; Lonigan et al., 1998; Foorman, Francis, Fletcher, Schatschneider, & Mehta, 1998; Whitehurst & Lonigan, 2001; Lyster, 1998; Torgesen et al., 1999; Molfese, Beswick, Molnar, & Jacobi-Vessels, 2006; Vadasay, Sanders & Abbott, 2008) and found that multisensory teaching develops the reading acquisition of all types of readers (National Reading Panel, 2000; Hazoury, Oweini & Bahous, 2009; Van der Putten, Vlaskamp, & Schuivens, 2011).
From these research studies, it is clearly evident that the multisensory approach is one of the most effective, suitable and research proven approach for teaching reading to all types of readers including normal readers as well as struggling readers at all ages and abilities.

1.11.2 Technology Integrated Multisensory Approach

The use of technology is inevitable in teaching learning process because this era is a technology driven era. Technology is utilized in all the fields including in teaching. The term technology is defined as “any item, product system, computerized device or software tool that was used to increase, maintain or improve functional capabilities of an individual” (Lewis, 1998). Therefore, technology integrated teaching develops the learning ability (Hall et al., 2000; Lally, 2001) of an individual because it attracts the attention of the learners and sustains it for a long duration. In addition to this, it provides input through all sense modalities which includes visual, auditory, kinaesthetic and tactile. Reading intervention that integrates multisensory approach with technology enhances the reading abilities of the dyslexic students (Torgesen & Barker, 1995; Dynarski et al., 2007). Research studies have proved the effectiveness of technology supplemented teaching (Torgesen & Barker, 1995; Nicholson, Fawcett & Nicholson, 2000; Underwood, 2000; Segers & Verhoeven, 2002; Chera & Wood, 2003; Magnan, Ecalle, Veuillet, & Collet, 2004; Segers and Verhoeven, 2005) and
technology integrated multisensory teaching (Elbro, 1996; Wise, Ring, & Olson, 1999; National Reading Panel, 2000; Van Daal & Reitsma, 2000; Saine, Lerkkanen, Ahonen, Tolvanen, & Lyytinen, 2011) for reading acquisition of individuals with dyslexia.

In summary, the research evidences proved the efficacy of teaching reading to students with dyslexia and at risk dyslexia through technology integrated multisensory instruction in a structured, systematic, sequential order that concentrates on the development of all the language components, improving the reading ability of the dyslexic learners.

1.12 Conceptual Synergy among the Variables in the Present Study

Reading is a fundamental skill which needs to be acquired by the students in order to be successful in the academic arena and society (Kumar, 2008). Some students have difficulties in acquiring the reading skill; their reading impairment is reduced through remedial teaching, even after the remedial teaching a few students still have trouble in learning to read. These students have severe reading difficulties due to impairment in the central nervous system that they are referred as students with dyslexia and at risk of dyslexia. Therefore reading acquisition is the major problems for dyslexics. So, the students with dyslexia need intensive reading intervention to develop their reading ability.

Rack, Snowling, & Olson (1992) and Share & Stanovich (1995) reported that dyslexics have reading impairments due to the core deficits in the phonological awareness and it was proved by researchers that the phonological awareness has a strong association in the development of reading ability (Snowling, 2000a; Torgesen, Wagner, Rashotte, Burgess, & Hecht, 1997). Therefore, students with dyslexia exhibit poor phonological awareness. It is considered as one of the best predictors of success in reading ability (Torgesen et al., 1994; Stanovich & Siegel, 1994) of the students in later years as well as the best indicator (Wagner & Torgesen, 1987; Wagner et al., 1994) to identify at risk of dyslexia in the early stage itself. The phonological awareness has a direct link with the alphabet knowledge that the knowledge of letter-sound association facilitates in manipulating the spoken sounds of the language, ie, phonological awareness task.
Another important problem of the students with dyslexia and at risk dyslexia is the difficulty in reading fluency that depends on the mastery of prerequisite skills which includes alphabetic principle, phonemic awareness, rapid and automatic decoding, knowledge of sight words and word recognition skill (Stanovich, 1980; Perfetti, 1985; Meyer & Felton, 1999). Finally, reading comprehension is another core area of difficulty for these students, but for the present study, teaching of reading comprehension was not included because it is the highest level of reading acquisition and it can be developed only after mastery of the lower order reading skills such as alphabet knowledge, phonological awareness and fluency in reading (Shankweiler, et al. 1999; Perfetti & Hart, 2001).

In a nutshell, the reading impairments of the dyslexics and at risk of dyslexia can be prevented through appropriate multisensory reading intervention integrated with technology (National Reading Panel, 2000; Torgesen, 2002; Scammacca, et al., 2007; Mathes et al., 2005). In order to enhance the reading performance of the struggling readers (at risk dyslexics) and dyslexics, reading intervention must be provided in the above mentioned reading sub skills.

Research studies reviewed by the investigator have confirmed that multisensory reading intervention integrated with technology improves the reading performance of the students with dyslexia and reduces the reading difficulties of students with at risk dyslexia. First, the reading intervention should focus on the development of prerequisite skills for learning to read like phonics, alphabet knowledge, phonological awareness and word recognition skills. Secondly, the intervention for these students must follow the principle of teaching from easy to difficult concept and lower order reading skills to higher order reading skills. Thirdly, the reading intervention has to be direct, explicit, structured and systematic for these students. Finally, based on the insights gained from the conceptual framework of the variables of the present study, the researcher has developed research questions, selected the appropriate methods to measure the variables, while strategy development and analyses were planned for the current study.
1.13 Rationale of the Study

Early identification of special needs children is the benchmark for designing any intervention programme. According to researchers Snowling & Hulme (2011), Torgesen, Foorman, & Wagner (2008), and Foorman, et al (1997) early identification, assessment and remediation were important to help the dyslexics overcome their reading and spelling difficulties. As per the statistical data, India had 199.7 million children in the elementary school stage (The National University of Educational Planning and Administration, 2012). It was disheartening to see that in India, it was estimated that approximately 39 million (NUEPA, 2012) to 40 million (Gupta & Whitehead, 2014) children, were likely to have SpLD. Only 0.1 percent students were being identified as SpLD till 2014, but the expected number of students with SpLD could be 20 percent (Gupta & Whitehead, 2014). The researcher took cognizance of the scenario to take up the study for developing an intervention for them. Therefore, it was taken into consideration by the researcher that 10- 14% of the student population in III standard were found to have SpLD, which provided an impetus for the present study to identify at risk dyslexics in the III standard and to develop an intervention strategy to help them enhance their reading performance in English. In the modern era, English is inevitable for wider communication and hence reading problems of at risk dyslexics at primary level has to be addressed. The quantum of research studies conducted in India focused on the awareness about SpLD among various groups such as parents, teachers and medical professionals. Also the researchers developed remedial reading interventions for the SpLD students with their medium of instruction as English. Some of the researchers namely Rama, Gowramma, Karande & Geetha investigated the problems of dyslexics in bilingual students and the strategies to teach these students. A research gap was identified that there were no adequate research studies which addressed the reading difficulties of students at risk of dyslexia. To fill this gap, the present study is the first of its kind which is set to scientifically develop an intervention strategy to enhance reading performance in English for grade III students with “At Risk of Dyslexia” in government schools in Puducherry, who hail from rural and remote areas.
1.14 Scope of the Study

The present study takes up the less explored area of research in the field of dyslexia in the Indian context and focuses on remediating reading difficulties of students at risk of dyslexia in the early stage itself. The contributions of this study are very useful to the parents and teachers to identify at risk dyslexics and for teachers to provide appropriate interventions to develop the reading performance in English in general classroom settings, particularly in developing the process of learning to read in English for those who study English as a second language. Studies on accommodation, rehabilitation, problems of special needs children and parents, and appropriate interventions are the core area of research in the inclusive education, to which the present investigation is significant.

The study attempts to fill the research gap and add new knowledge in the literature of Specific Reading Disabilities in India through identifying the bilingual dyslexics in their initial stage with the strategy being developed to improve reading performance of the students. The contributions from the study are as follows: First, the development of a screening tool to identify at risk dyslexic students; the tool can be used by special educators as well as the general classroom teachers to screen the dyslexics in mainstream education; Second, appropriate strategy has been developed to improve the reading performance of the bilingual at risk dyslexic students; Third, the developed teaching strategy can also be used to enhance the normal students’ reading performance, those who are slow in acquiring the skill of learning to read in English; Fourth, the investigator integrated technology which provides a multisensory learning situation that facilitates the attention of these students and improves their retention of learned concepts. Finally the findings of the present study provide pedagogical implications to improve the reading performance of students at risk of dyslexia and recommendations for policy making. In addition, the present study is very much relevant and the need of the hour that focuses the development of reading skills in English of students “at risk dyslexia” studying in the government schools where the students from marginalized families are admitted.
1.15 Statement of the Problem

The research studies that addressed the problems of dyslexics and at risk of dyslexics in India were very few (Karande et al, 2005; Thapa, 2008) when compared to the western countries (Ramaa, 2000). The lack of standardized tools to screen dyslexic students (Ramaa, 2000) in the multi-lingual system and lack of trained manpower to teach these students (Saravanabhan & Saravanabhavan, 2010; Ravi, 2013), were the reasons for lesser research studies targeting dyslexics. Some of the related studies conducted in India, revealed that there was an increasing awareness on Specific Learning Disabilities and dyslexia (Thomas & Whitten 2012). It was also noticed, there was a dearth of research studies in India that dealt with identification of students at risk of dyslexia in their early stage and to implement appropriate reading intervention to develop their reading skills. Hence, the present study addressed this research gap and stated the research problem as, “Enhancing Reading Performance of Students At Risk of Dyslexia in English through Strategic Orientation supplemented with Technology”.

1.16 An overview of the study

The thesis is designed into six chapters. The first chapter deals with introduction and conceptual framework of the study. The second chapter deals with the Review of Related Literature. The third chapter deals with construction and validation of research instruments. The fourth chapter deals with the design of the study. The fifth chapter focuses on analyses and interpretation of quantitative and qualitative data and the sixth chapter deals with the findings, education implication, recommendations, and suggestion for further research.