Chapter II

Review of Related Literature for Gaining Insight
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FOR GAINING INSIGHT

2.1 Introduction

The main objective of the review of related literature is to find out the research gap in the area of study. Research gap is the presence of concrete and real need for a particular research. It is said to exist when there is a real, identifiable conceptual connection between the problem in literature and the research being conducted to address that problem (Creswell, 2005). In order to discover the research gap in the current area of study, the researcher has carried out an exhaustive search of relevant literature. Therefore, the review of literature was collected from the different sources such as journals including international, national and peer reviewed journals, books, edited books, computer databases of literature namely Science Direct, Web of Science, Jstor, Ebsco and Scepous which includes both primary and secondary sources in the form of print and online material. The researcher extracted the articles for the review from scholarly resources namely Annals of Dyslexia, Journal of Learning Disabilities, Reading Research, ProQuest, Dissertation Abstracts International, PubMed, International Journal of Special Education, Indian Journal of Psychiatry, Education Resources Information Centre (ERIC), Indian Journal of Medical Sciences, Applied Psycholinguistics, NIMHANS Journal, Psychological Studies, Buch’s Survey of Research in Education, Journal of Disabilities and Impairments, published and unpublished thesis, etc., The collected relevant literature in the area of study was reviewed and insight obtained from the review of literature to understand the variables under study, to frame objectives and hypotheses, to chose the appropriate methodology and analysis, to relate the findings of the present study to the existing findings of prior studies and address the research gap in the area of study (Cooper, 1984; Marshall & Rossman, 2006).

The Specific Reading Disabilities i.e., Dyslexia is a broad area of the present study. There is a plethora of relevant literature in the area of the study. The researcher reviewed the related studies with special reference to “dyslexia and at risk dyslexia” for
the past two decades from 1990 as research in the field of Dyslexia is of recent origin (Ramaa, 2000; Saravanabhavan & Saravanabhavan, 2010). In the Indian context, dyslexia was first recognised as a disability and granted provisions in 1996 by the Maharashtra Government (Maharashtra State Education, Research and Training Center, 1996; Gopal, 2013). Indeed some of the studies undertaken 1980s in Dyslexia (Torgesen, Mary, Waters, Andrew, Cohen, and Jeffery, 1988) and Brady et al. (1989), Ramaa (1984), Prerana (1989) were included for the pioneering author’s work to test the consistency of the findings and its relevance in the present day context. The studies reviewed were classified into two categories. They are Studies Conducted Abroad and Studies Conducted in India.

2.2 Studies Conducted Abroad

Reynolds, Wheldall and Madelaine (2011) conducted a Meta analysis on recent reviews on the Efficacy of Reading Interventions for Struggling Readers in the early stages of schooling. The reviews selected for this Meta analysis revealed the pros and cons of the efficacy of reading intervention. The insight gained by Reynolds et al. (2011) was that the student at the age of 2 to 3 years missed the reading amount; it was difficult to catch up with reading fluency and sequence. The intervention at the first two years at pre-school level was more effective than at any other age, specially in the areas of reading accuracy and fluency (Wanzek & Vaughn 2007). The studies selected were also highlighted that Phonemic awareness instruction was found to be highly effective for poor readers (Torgeson, 1997). The minimum duration of the intervention should be 30 minutes per day (Vaughn, et al., 2010). The components of reading intervention and duration of the intervention were taken cognizance for this study.

Stahl and McKenna (2006) reviewed phonics instruction for children with reading disabilities. The studies reviewed recommended the systematic and consistent program of phonics instruction. The famous method to teach dyslexics was the synthetic phonics programs which comprised the Orton-Gillingham approach. To support, Ogden et al. (1989) the adopted alphabetic phonics method to teach reading to children for three years. The participants were students with learning disabilities at Grade 1, 2, 3, or 4. The instruction resulted an improved reading performance. The effectiveness was significant for grade one than that of other graders in teaching
through phonics method. Kline and Kline (1975) treated the identified dyslexics by Orton-Gillingham-based instruction and recommended it as the best instructional approach for reading. Phonics method was incorporated in the development of strategic orientation in the present study.

That phonological reading instruction provides effective gains in non-word reading otherwise known as nonsense word and real word which is phonologically strong reading was reported by Nagy, et al (2003). Similarly a number of major studies have demonstrated the importance of direct or explicit instruction to student learning. Explicit and direct instruction has been shown to be efficacious in learning and teaching the major components of the reading process—phonemic awareness, phonics, fluency, vocabulary, and comprehension (National Institute of Child Health and Human Development, 2000). The components were identified from the study for developing the reading performance of students at risk of dyslexia.

Small-group instruction was more effective than either individual or whole-class instruction (Ehri et al., 2001) and was certainly more efficient in terms of time duration and trained teachers (Hatcher et al., 2006). In support, Vaughn, Hughes, Moody and Elbaum (2001) proved that smaller groups provided a better gain in instruction than larger groups. At the same time, Vaughn et al. suggested that teacher-led small groups of three to six children were ideal. This group size corresponded well with the expected number of students at risk for academic difficulties in a class of 20–30 students. The students were given strategic orientation in small group (sample size =16).

Evidence-based research at the first grade level to practice reading was conducted by Joshi, Dahlgren, and Boulware-Gooden (2002). The treatment group received multisensory instruction based on Alphabetic Phonics. The control group received Basal Reading Program. The participants were selected keeping in mind that no students had vision, hearing, or cognitive difficulties. Pre-test data was taken with a battery of instruments, including Test of Phonological Awareness (TOPA), Word Attack subtest of Woodcock Reading Mastery Test-Revised (WRWT-R), and the comprehension section of Gates-MacGinitie Reading Test (GMRT). The result
indicated that students taught with the alphabetic phonic method, performed better on tests of phonological awareness, decoding, and reading comprehension than the control group. The study also suggested additional research was required in the approach across grade levels and that more teachers needed training in multisensory methods. The present study took cognizance of this research gap and phonological awareness training to the children was also considered.

The effectiveness of the three different reading interventions (synthetic phonics, analytic phonics, or sight-word programs) in 2nd and 3rd graders with identified reading disabilities was examined by Foorman, et al. (1997). Synthetic phonics is a method of teaching sequentially i.e. teaching letter sound followed by who word pronunciation and analytic phonics is an approach to teaching reading through the written text. Trained special education teachers taught the participants either synthetic phonics or word programs in the resource room for 60 min a day for one academic year. The findings of the study indicated that synthetic phonics method enhanced the phonological awareness skills of the students.

Similarly, Joshi et al. (2002) tried explicit instruction in synthetic phonics supplemented with multisensory approach. The study was conducted on at risk of poor readers from different schools on non-randomised control and experimental groups. The results of the study revealed that synthetic phonics supplemented with multisensory method enhanced the reading ability of the at-risk readers. Indeed, the study provided impetus for the researcher to develop a multisensory approach to improve the reading performance of students.

Students at risk of reading failure at kindergarten were identified by Torgesen, et al., (2008). Tests such as phonemic awareness, letter-sound knowledge, or phonemic decoding were set to identify the reading problems of the reading difficult. Prevention of reading difficulties in students with dyslexia required both effective classroom instructions during the regular “reading block” and powerful intervention support for children with the most severe phonological processing difficulties (Torgesen, et al., (2008).). The most efficient approach for these students was usually to provide intervention support focused on their areas of primary difficulty which would typically
be knowledge towards letter sound and its function, and text reading accuracy and fluency for the large group of students “at risk” for reading difficulties. These children had come largely from families of lower socio-economic or minority status, or they were English Language Learners, and they entered school significantly late and lacking much broader range of pre-reading skills (Whitehurst & Lonigan, 1998; Hart & Risley, 1995). The instruction for children with severe dyslexia was more explicit and comprehensive, more intensive, and more supportive than the instruction provided to the majority of children. Interventions provided to students with dyslexia should also be targeted on the specific types of skill and knowledge that are interfering with their reading growth.

Indeed, Torgesen examined the approaches to tutorial instruction with a sample of young children selected in kindergarten with poor phonological processing skill along with other researchers during 1999. The experimental approaches emphasised on explicit and intensive instruction in phonemic decoding skills. The explicit and intensive instruction was recommended to enhance the phonemic awareness and phonemic decoding skills. It should be assumed that one-to-one instruction will have a significant impact on word-level skills in children who have serious phonological processing weaknesses. Explicit and intensive instruction was provided to students at risk of dyslexia to develop their phonemic awareness.

It is imperative for the present study to note that the evaluation done Torgesen, et al. (2010) on the effectiveness of two computer programs for students with dyslexia to develop their reading skills. Computer-based instruction and practice were initially taught by teachers in supplemental intervention sessions. The computer programs provided explicit and systematic support for the development of phonemic awareness, phonemic decoding (and writing), and text reading accuracy. The findings revealed the fact that the computer-based instruction in this study was offered as a supplement, rather than as a replacement for teacher-led instruction. Thus present study took cognizance of the computer-supported intervention model as a way to provide effective supplemental reading instruction for young students.
It will be of immense help to analyse the study designed by Wise, et al (1999) to compare the benefits of phonological awareness training for the 113 students with dyslexia in the 3rd grade. Pre-test, intervention, post-test, and year-later follow-up design were used in the study. The participants were provided equal interval of time duration for the instruction in small groups, on the computer, and one to one with the teacher. The study assessed Word recognition, Phonological decoding and Phoneme awareness before pre-test and after post-test. The phonological training was conducted on different associations such as, articulatory gestures in association to sounds and spelling- sound patterns and analytic spelling and reading exercises. The finding of the study suggested that all three phonological training associations made impressive and lasting gains. Phonics instruction with computer speech- support recorded highly effective gains in the training of the students with dyslexia. In fact, the present study was also set to develop reading performance of primary school children by means of a technology enabled multisensory strategic orientation.

A comparative study of synthetic phonics Programme (SSP) and the intensive teaching of High Frequency Words (HFW) through look and say approach was conducted. Multiple methods such as miscue analysis, Scaffold Reading Test, a phoneme skills test and HFW audits were used to collect data. This investigation suggested that synthetic phonics method was the superior method of teaching reading at early stage in the primary schools (Watts & Paul Gardner, 2013). However, intensive teaching of HFWs words, using the ‘look and say’ approach (Oakhill & Beard, 1999) improved word recognition for the majority of pupils. Therefore it was recommended that teaching of HFWs should be integral to the teaching of early reading.

Also, it was heartening to review that Fluency Development Lesson (FDL) was developed to reduce the difficulties in fluency and in learning to read, among dyslexics. The lesson was taught as an intervention program for 10 to 15 min per day. The teacher played the role of instructor in this reading fluency development programme. The main aim was to develop the reading development lesson including modelling fluent reading for students and providing students with repeated reading practice of written passages. At the same time assistance and coaching were given simultaneously in the repeated
reading (Rasinski, Padak, Linek, & Sturtevant, 1994). The present study used repeated reading practice to develop the reading fluency of the students at risk of dyslexia.

The emphasis on phonics or text reading was compared with the achievement outcomes of low reading performers by Scanlon, et al. (2005). The participant were 1st grade students with low achievement in reading literacy skills. The phonic and text reading method was implemented for 30 minutes each day. The reading skill components delivered through instruction were phonological components, text reading with associated meaning. The study found that the intervention emphasized phonic method of teaching reading was more effective than text reading method in increasing the reading performance of the poor readers. Phonics reading was one of the components considered in the present study having a heterogeneous sample group.

Duff et al. (2008) taught eleven 11 year old students who had poor reading performance and found out the effectiveness of combined Reading Intervention (Hatcher, Hulme, & Ellis, 1994; Hatcher et al., 2006) and robust vocabulary instruction (Beck, McKeown, & Kucan, 2002). The trained teacher assistants demonstrated the intervention program for period of nine-week and 15 minutes on all working days. Scores of the treatment group had increased on reading, phonological and vocabulary tests and the same were retained by conducting a re-test after six months. It was found out that reading fluency was increased and meaningful learning of the vocabulary was very slow. In the present study, the researcher herself trained the students with the strategy.

It was very useful to review the study on the progress in the reading literacy of three hundred students. Johnston and Watson (2005) used Analytic phonics, synthetic phonics and analytic phonics approaches to trace the progress of reading. The study was conducted for six years from 1st grade to 7th grade. The intervention was given for 20 minutes a day for 16 weeks. It was assumed statistically that the students who were taught using a synthetic phonic approach achieved superiority in reading and spelling performance. The study by Foorman et al (1997) confirmed the effectiveness of synthetic phonics in developing the reading skills of the students. The present study included synthetic phonics as one of the teaching strategies in the orientation.
The reading skill of seventy seven dyslexics from the 1st grade from fourteen schools was enhanced by Hatcher et al. (2006). The participants were randomly distributed and 20-week intervention to enhance reading skills was given daily for about 20 minutes in a classroom set-up. The students received training in letter-sound association and phonological awareness. The study found out that the participants in the intervention had significant gains in the first 10 weeks from the entry behaviour. In the second 10 weeks, the new group of students made more rapid progress in the intervention. Overall the 20-week intervention progress appeared to plateau in reading skill acquisition. The study indicated that differentiated intervention for longer duration gradually enhanced the reading performance of dyslexics.

Margaret (1997) compared twenty dyslexic students with their ability to speak, listen, read and write French with non-dyslexics students in schools. The samples were taken of ages between 11 years to 16 years, social background and foreign language acquisition (French). The study adopted control design for investigation. Assessment scores given by the class teachers in the four areas of speaking, listening, reading and writing, were taken for comparison. Margaret identified the performance of dyslexics was poor not only in reading and writing but also in listening and speaking when compared with non-dyslexics, even though there were individual variations. The most affected component of the dyslexics’ poor achievement was phonological processing as well as phonological awareness. As a reflection of phonological difficulty in English language, the dyslexics found difficulty in processing French language phonology and required double the required time of the normal children in phonological processing in learning French. The result supported the hypothesis that the dyslexic group has more difficulty in phonological tasks in reading and writing. The study concluded that teaching methodology for dyslexics had to be re-structured otherwise the dyslexics would have faced a serious risk in foreign language acquisition. Thus the researcher took cognizance and so phonological awareness is the part of the present research.

The effect of three interventions: Alphabetic Phonics group, sight word group and an analytic phonics group was experimented by Foorman et al. (2009). The sample was selected from grades two and three students, who had reading disability. One hundred and fourteen students were selected at random from 12 Schools. The study
adopted a quasi-experimental design. The interventions were provided by Special School Teachers on all working days for 2 hours for 8 students in 14 classrooms of one academic year. The result showed that alphabetic phonics group performed better than analytic phonics group and the sight word group. Therefore, the three groups showed no differences for orthographic processing or word reading when the covariates were controlled.

Packaged multisensory reading intervention to enhance the reading skills of letter and word identification, word attack, sound awareness and speed of sight-word reading was used by Giess (2005). Eighteen high school students with dyslexia were selected as participants for the experimental and control group design. Nine students were allotted for each control and treatment group. The researcher adopted a stratified sampling technique. The students were allotted to each group based on the cut-off score criterion. The measures of ANCOVA showed no significant differences between groups in the post-test. The study inferred that the Remedial reading-intervention programs were not the perfect choice to replace routine literacy instruction and suggested the conduct of more rigorous and intensive instruction to randomized experimental group.

A reading basics method supplemented with multi-sensory approach was administered for “I” grade students with dyslexia (Joshi, et al., 2002). A quasi-experimental method was adopted. Out of four schools, there were 32 students with dyslexia from 2 schools as the treatment group and 24 students with dyslexia from the other two schools as the control group. The duration of intervention instruction for both the groups was 50 minutes a day. The tools used to collect data were the comprehension subtest from the Gates MacGinities Reading Test (GMRT), the word attack subtest from the Woodcock Reading Mastery Test Revised (WRMT-T), and the Test of Phonological Awareness (TOPA). The pre-test and the post-test scores were taken for phonological awareness, word attack (pronunciation) and reading comprehension. The findings of the study revealed that the treatment group was found better significantly in phonological awareness, word attack and reading comprehensions than their counterparts in the control group. Indeed the present study developed the treatment with a multisensory approach.
Oakland, et al. (1998) organised a Dyslexia Training Programme (DTP) to identify students with dyslexia. This study addressed two research questions: “Do students with dyslexia who receive the DTP through either the teacher-directed or the videotaped method differ in the amount of progress they make in reading and spelling skill development?, Do students with dyslexia who receive the DTP show significantly greater progress in reading and spelling achievement over a 2-year period than similar students who receive other instructional programs. It was found that the Dyslexia training Programme was effective and comparable progress was obtained between teaching through video tape and live teaching. The method also obtained significant gain in word recognition and reading comprehension.

Litcher & Roberge (1979) assessed the effect of Multi-sensory instruction to a controlled reading instruction which refers to classroom reading. The participants were screened and identified as twenty students at grade one level. A quasi experimental design was used. The experimental group was taught by the multisensory method of reading. Reading instruction was given for three hours a day. Intensive and explicit intervention was provided to these students. At the end of the school year, each student was assessed using the Metropolitan Achievement Tests (MAT) and the Gates MacGinitie (GM) Reading Test. The MAT assesses students’ reading comprehension, decoding, letter knowledge, semantics, and phonological awareness. The Gates MacGinitie (GM) Reading Test assesses student achievement in reading. The multisensory approach developed the students reading performance in the letter knowledge, semantics and phonological awareness. It is of interest to note that the traditional method also enhanced the vocabulary and comprehension ability of the control group.

A quasi-experimental study was conducted by Stoner (1991) to assess the effectiveness of the Project Read Strategy basal reading. The Project Read is supplemented with a multi-sensory method. Students at risk of dyslexia from 1st grade to 3rd grade were identified by their teachers. These students were found to have persistent difficulties in acquiring alphabet knowledge. The intervention was given at the classroom setup by the teachers who were trained under this project. The intervention focused on developing alphabet knowledge, vocabulary and
comprehension ability of these students. The students were assessed using the Stanford Achievement Test. It was found that project Read increased the word reading, comprehension, and total reading.

Wilson and O’Connor (1995) remediated the learning disability students by the Orton and Gillingham approach using the multi-sensory method of teaching reading. A total of 220 students who were identified from 3rd grade to 12th grade as learning disabilities students participated. Purposive sampling technique was adopted. The students who were not progressing in their reading were selected for the study. The researcher administered pre-test and post-test experiment to collect data by using the Woodcock Reading Mastery Test. The study assessed the students reading performance on word attack skills, word identification and passage comprehension. It was found that there was an average increase on reading performance in word attack skill of these students who were given multisensory intervention. The study indicates that these students need to be provided intervention for a longer duration to alleviate their reading problems.

From these research studies the researcher identified that the multisensory approach was the most widely used approach integrated with synthetic phonics method to develop reading skills of both normal readers as well as students with reading difficulties.

Special education teachers and general education teachers were utilised as a facilitator by Pokorni, Worthington and Jamison (2004) to enhance the reading ability of students at risk of dyslexia through Fast For Word, Earobics and LiPS interventions. The initial two interventions were computer based training and the last intervention was guided by a speech and language pathologist. The intervention was given to 60 students at 3rd grade in a resource room for one hour daily for 20 days. The performance of the students in Earobics and the LiPS improved the Phonological Awareness skills, a major reading component. The researcher suggested that effect size will be enhanced when the intervention is prolonged for longer period at the earlier stage of schooling. Similiarly, scripted instruction was used to enhance the phonological awareness by Ryder, Tunmer and Greaney (2008). Twenty four students at risk of reading at 1st and
2nd grade were assigned equally to a treatment and controlled group. The findings revealed that the scripted instruction enhanced the reading than that of traditional method of teaching reading.

An early reading intervention was given to the kindergarten children at risk of dyslexia by Vellutino, Scanlon, Small and Fanueles (2006). The samples were randomly assigned to treatment group and control group. The intervention was facilitated by the teacher for 30 minutes duration two times per week. The researcher found out that early intervention enhanced the print awareness, alphabet knowledge, phonological awareness, shared and guiding reading. The intervention also identified the students in need of severe and continued intervention on reading. In another study, the performance of 97 kindergarten children on phonological awareness intervention and a spoken language intervention was assessed by McIntosh, Crosbie, Holm and Dodd (2007). The results of the study proved phonological awareness intervention increased the level of reading.

From these studies, the researcher identified that phonological awareness is a predominant component. The students at risk of dyslexia need intervention to develop their reading performance. It was effective in increasing the reading performance when training in phonological awareness was combined with alphabet knowledge. Hence, the researcher included alphabet knowledge as yet another component in the strategic orientation.

Computer-Assisted Instruction (CAI) programmes supplemented with interactive task was developed by Lonigan, Driscoll, Phillips, Cantor, Anthony and Goldstein (2003) to enhance the phonological sensitivity of 2nd graders at risk of reading difficulties. The participant followed speech in digitalised instructions through phonological sensitivity to develop rhyme, sound matching, onset-rime, blending and counting phonemes. The intervention involved 15-20 minutes of activities, 4 to 5 days a week for 8 weeks. This study recommended that CAI can be an effective means of increasing phonological awareness. This study also suggested special teacher and general teachers must be aware of computer knowledge to deliver the instruction. Similarly, Magnan and Ecalle (2006) found that computer-based reading intervention
can promote phonological awareness and reading acquisition for children at risk of dyslexia. The researcher experimented with sixty seven children from a kindergarten with poor phonological awareness. The students were screened by a phonological tasks battery and a teacher questionnaire was designed to select the children. Each training session lasted 20 minutes and the course four weeks. The findings revealed that intervention supported with CAI improved the pre-reading skills.

The sub-skills of phonological awareness were identified from the study conducted by Lonigan et al. (2003) for the present study. The study done by Magnan & Ecalle (2006) showed that training through audio visuals increased the phonological awareness skills of students at risk of dyslexia. Hence, the researcher used technology as a supplementing device in the strategic orientation.

Torgesen et al. (1999) conducted an experiment to determine the relative effectiveness of three interventions on phonemic decoding skills. One hundred and thirty eight students in the age group of 6 years who had slow rate in the development of phonological processing skills were distributed randomly on four conditions i.e. 1) No-Treatment Control (NTC); 2) Regular Classroom Support (RCS); 3) Embedded Phonics (EP); or 4) Phonological Awareness Plus Synthetic Phonics (PASP). Word level reading skills and phonological awareness was assessed for six times during the intervention. Word level and phonological awareness scores varied little between the groups and a negative variation in NTC. The findings indicated that all the three reading interventions enhanced word reading and phonological awareness of the students.

A study by Byrne, Fielding-Barnsley and Ashley (2000) researched the efficacy of Sound Foundations programme designed to enhance the phonemic awareness of 5th grade level students at risk of reading difficulties. Six phonemes in initial and final positions in words supported with posters, games, worksheets and audiotape were taught to treatment group. Simultaneously, the control group was taught through semantic activities supplemented with the same programme. The intervention was given for 30 minutes per week for 12 weeks. The study noted the limited time on
focusing phonemic identity enhanced long term reading performance when taught through the Sound Foundation Programme.

The studies emphasized the need for differentiated interventions for students at risk of dyslexia in the phonemic awareness skills. Hence this research included phonemic awareness components in the strategic orientation.

Quasi-experimental design was used by Kamps et al. (2008) to investigate the effectiveness of small (one to six students) group reading interventions with varying levels of explicitness for reading difficulty students in the second grade. Interventions based Response To Intervention (RTI) framework was implemented for 30 to 40 minute per sessions at least three times each week. Kamps et al. found highly structured, directed and explicit instruction was effective in improving the reading skills of at risk dyslexics. Students in the experimental group outperformed students in the comparison group.

One-to-one supplemental tutoring intervention was effective with struggling readers (Sprick, Howard, & Fidanque, 1998). A single subject design was used to confirm the above statement by Jitendra et al. (2004) where the researcher implemented Read Well intervention to 1st to 3rd grade reading difficulty students. The Read Well intervention comprises direct and systematic approach in combination with phonological awareness, phonics and reading fluency. The student at first grade level in reading development experienced an intensive intervention for 20 to 40 minutes four days per week (2 to 7 weeks). The students worked through instructional units to master the content. Post-testing revealed an effective increase in word reading and decoding skills and exhibited individual differences in reading fluency.

Frequent, short, intensive whole-class intervention focused on a few core skills namely, segmentation and blending, resulted in an increasing reading performances for all students (Shapiro & Solity, 2008). The researchers suggested that the increase in the duration of intervention for students at risk of reading with regards to segmentation and blending enhances reading. Simmons et al. (2007) confirmed the suggestion given by Shapiro and Solity. He provided an intervention for a longer duration of time than that
of normal students and it resulted in a positive impact on developing the reading performance of poor readers.

The studies by Kamps et al. (2008), Simmons et al. (2007) and Jitendra et al. (2004) emphasized that struggling readers should be provided structured, direct and explicit reading intervention for their reading development. Hence, the researcher incorporated their suggestions in the strategic orientation to improve the reading performance of students at risk of dyslexia.

One-to-one instruction and classroom process models are most effective for students at risk of reading as suggested by Slavin et al. (2011). The results of the study revealed that the effect sizes for one-to-one tutoring by teachers was found to be 0.38, one-to-one tutoring by paraprofessionals as 0.38, one-to-one tutoring by volunteers as 0.16, small group tutorials as 0.31 and classroom process approaches as 0.56. These conclusions were reached by pooling the results of interventions of varying quality and that it does not provide conclusive evidence that one-to-one tutoring is the most effective instructional condition. Similarly, Helf, Cooke and Flowers (2009) compared instruction in one-to-one and one-to-three groupings on the reading achievement of at-risk reading of year one students. They found that students in the small group progressed at a similar rate as those who were instructed in one-to-one mode.

Ehri et al. (2007) compared the effects of Reading Rescue, an intervention that features one-to-one instruction, with Voyager Passport, an intervention based on small group instruction on the reading achievement of grade one students. Reading Rescue is similar to Reading Recovery but includes systematic phonics instruction and phonological awareness training. Students in Reading Rescue made significantly greater gains than those who were in the small group intervention and no intervention.

Peer-assisted instruction with small group teacher-directed intervention and undifferentiated instruction on first-grade student achievement showed more improvement on reading. Mathes et al. (2003) in experimenting with the above finding obtained higher effect sizes in the teacher-directed condition than in the peer-assisted instructional condition. This effectiveness was obtained for a smaller sample size.
The studies by Slavin et al. (2011), Helf, Cooke and Flowers (2009), Ehri et al. (2007) and Mathes et al. (2003) indicated that small group reading intervention benefits students at risk of dyslexia.

The benefit of phonological processing skills training for children with persistent reading difficulties was evaluated by Gillon and Dodd (1997). Children aged between 9-14 years with specific reading disability participated in the study. Three experiments were conducted simultaneously to identify the pedagogical issues related to length of training time, model of intervention and severity of phonological processing skills deficit. The results indicated that improvement in poor readers’ phonological processing skills led to a dramatic improvement in their reading accuracy. Increasing the length of training time significantly improved transfer effects to the reading process. Children with particularly severe phonological processing skill deficits benefited from an extended training period, and both individual and group intervention models for phonological processing training proved successful.

The performance on reading and language tasks given to children with reading problems was examined by Joanisse et al., (2000). They used three dyslexic groups identified as Phonological Dyslexics (PD), developmentally Language Impaired (LI) and globally delayed dyslexics at the second grade level. They indicated similar patterns of reading problems with low phonological skills.

The studies by Gillon and Dodd (1997) and Joanisse et al. (2000) indicate that Phonological problems are common to all students with reading problems and need remedial instruction in phonological awareness.

The relationships among naming speed, phonological awareness, orthographic skill and other reading sub-skills in a representative sample of second graders was investigated by Manis et al. (2000). They found that the unique contribution of naming speed to reading was relatively stronger for orthographic skills, whereas the contribution of phonemic skills was stronger for non-word decoding.

In 2002, Catts et al., investigated the role of the speed of processing, RAN and phonological awareness in reading achievement. They measured RAN, phonological
awareness and reading achievement in the second and fourth grades. In reading group comparisons, they indicated that poor readers were proportionally slower than good readers across response time measures and on the RAN task. They suggested that some poor readers had a general deficit in the speed of processing. They also suggested that a speed of processing deficit might be an extra phonological factor in some reading disabilities.

The association between RAN and reading fluency of dyslexics was found by Norton and Wolf (2012). The author has identified and proved that RAN is best predictor to identify the At Risk of reading disability children at an early stage which can be used by the psychologist and educators in their assessment. They insisted that repeated reading and RAN should be the one of the important components in the intervention for dyslexics to improve their reading fluency. The results of the study revealed that the experimental group improved their reading performance when given intervention in RAN, repeated reading and phonological awareness.

The contribution of Phonological Skills and Letter Knowledge to Early Reading Development was identified by Muter and Diethelm (2001). The study was longitudinal study and conducted for a period of 2 years. The 55 students (27 were girls, 28 boys) from two kindergarten classes at the International School of Geneva, Switzerland, participated in the study. The researcher obtained the data by assigning Phonological Awareness Tasks: rhyme detection, rhyme production, word completion (syllables and phonemes), and phoneme deletion (beginning and end sounds), together with a measure of Speech Rate and a test of Alphabet Letter Knowledge. The study found out that phonological abilities are good predictors of both concurrent and later reading achievement.

Ellen (2014) stated that phonemic awareness, RAN and verbal short term memory play an important role in developing reading performance. RAN developed the reading fluency and reading speed. From the results of the study, the researcher proved that dyslexic children have problems in phonological awareness.

From these studies, the researcher identified that struggling readers have difficulties in Rapid Automised Naming of Alphabets and that it has a strong
The relationship between phonological awareness and working memory of students at risk of dyslexia among Egyptian Arabic – speaking children was correlated by Amal (2013). Experimental design and simple random technique was used for the sample selection. The study found that the phonological awareness was one of the important components in learning to read and a good predictor of reading ability. They proved that at risk of dyslexic children whose native language is Arabic has impairment in phonological awareness skills like English speaking at risk of dyslexic children.

The problems in identifying young children who are at Risk of learning disabilities and the intervention techniques to teach these children was explained by Marcee (2004). He suggested that teachers play an important role in identifying the young children with LD. Teachers judgment of progress of the children can be used to identify the children who are at risk of learning disabilities. In order to identify the children who are at risk of LD the teacher should use the observation technique in the areas viz, difficulties in remembering alphabet, trouble in rhyming, frequent mispronunciation, and trouble in following directions. The researcher stressed the need to provide appropriate intervention to students At Risk of LD at the earlier stage. Phonemic instruction must be given to these children and they suggested that the activities like labelling, rhyming activities and game, letter games, syllable clapping be included as the components of the intervention to them. The present study took cognizance of the reading difficulties of the students at risk of dyslexia and items were taken for the development of At Risk of Dyslexia Screening Tool (ARDST).

An intervention was designed by Bailet and colleagues (2009) to enhance the rhyming, alliteration, picture naming, print and letter knowledge skills of students at risk of dyslexia. The intervention was implemented in 220 students from first grade with mild to severe problem on reading for 30 minutes per day for 9 weeks. The content for the intervention was standardised by the subject experts before implementation. The findings of the study revealed a positive improvement on the
selected components of reading after the intervention. The study was repeated a second time by Bailet, Repper, Piasta and Murphy (2009) where trained teachers were allowed to give the intervention programme for students at risk of reading. The intervention lasted for 9 hours, for a week. The students at risk of reading made significant improvement in reading skills. Components of reading were taken from this study to develop strategic intervention.

From the study, the investigator identified that the students at risk of dyslexia need to be provided intervention in alphabet knowledge and the duration for intervention was also taken cognizance of.

The Intervention was supported by play-based programme developed by Young (2009), assessed vocabulary, phonological awareness, name writing, vocabulary writing, code identification, alphabet knowledge of students with dyslexia. The intervention is implemented for a 5 month period with 50 children at 2\textsuperscript{nd} grade level. The researcher evidenced a significant improvement in retaining alphabet knowledge and phonological awareness. It was evident from the study that play-based reading intervention enhanced the reading performance of students with dyslexia. Hence the researcher of the present study included language games in the intervention.

Supplemental instruction to enhance phonics was given to first and second grade students with reading difficulties by McIntyre et al. (2005). The researcher of this study noticed an improvement in phonics. This study lacks random assignment and the variables are not well controlled. In contrast, Rose (2006) in his longitudinal study on teaching phonics using a synthetic approach as supplementary instruction, found it very effective for students with dyslexics.

The processing time and accuracy in reading of dyslexic and regular readers was measured by Horowitz-Kraus and Breznitz (2011). Both groups exhibited longer reaction times for incorrect response but the dyslexics were significantly slower. Furthermore, both groups were less accurate and faster when recognizing letters as compared with reading sentences. The study indicates that dyslexics have difficulties in recognizing the alphabets.
The relationship between a phonological awareness and reading deficits in first grade was explored by Blomert and Willems (2010). In this study, evidence for the claim that a phonological awareness deficit causes a reading deficit via ‘unstable’ or otherwise corrupted letter–speech sound associations, was not found. This research indicated letter knowledge as another significant determinant of later reading deficits. Letter knowledge learning and learning to associate and integrate letters and speech sound are different processes and only problems in the latter process seem directly linked to the development of a reading deficit. The study emphasized that students with dyslexia need to be provided training in alphabet knowledge and phonological awareness skills. The suggestions were considered in the present study.

An experiment was conducted by Jones (2008) to manipulate the letter naming process systematically. The study determined naming-speed performance and its processes. The results suggest that non-dyslexics are better in naming speed than that of dyslexics. Further, the study evidenced phonological processes determine naming speed. Therefore, naming deficits processing in dyslexia depends on the difficulties in phonological domains. The study indicates an interlink between letter naming speed and phonological awareness. The present study included both the components in the strategic orientation.

The interrelations of speech skills and letter knowledge to the phonological awareness and early reading skills of ninety nine preschool “at risk” reading children were examined by Mann and Foy (2003). Phoneme awareness was correlated with early reading measures. Further, phoneme manipulation was closely associated with letter knowledge and with letter sound knowledge where rhyme awareness was closely linked with speech perception and vocabulary.

Orton-Gillingham reading intervention programme was empirically evaluated for one year by Hwee and Houghton (2011). Sixty one male and sixteen female students from Singaporean primary school children with dyslexia participated in the experiment. Pre-test and post-test experimental group design was adopted to find the effectiveness of the programme. A multivariate analysis of variance revealed
An intervention for Word stress acquisition of 3-year-old Dutch children at risk of dyslexia was given by De Bree, Wijnen and Zonneveld (2006). In this study the children had to repeat non-words with stress patterns varying in regularity. The result showed that at-risk children found it more difficult to imitate irregular and prohibited patterns. It is accepted that a delay in word stresses acquisition to at-risk of poor readers leads to dyslexia. The study indicates the students at risk of dyslexia had poor word recognition skill. The component was identified from this study.

Early reading intervention found marked improvement on standardized interventions when provided to struggling readers. Wanzek and Vaughn (2007) correlated a group of research on reading intervention using Meta analysis method. Eighteen intervention studies conducted on kindergarten to third grade were reviewed. Five of these studies (Jenkins, et al., 2004; Torgesen, Wagner, & Rashotte, 1997; Vadasy, Jenkins, Antil, Wayne, & O’Connor, 1997) provide reliable information about causal effects. Phonics instruction and text reading showed the highest effect sizes. It is also observed that greater effect size was gained on early intervention in reading at Kindergarten with smaller group sizes.

Three different modules (Alternating, Integrated, and Additive) of the Reading Achievement Multi-Modular Program were implemented with ninety middle school (sixth to eighth grades) students with reading disabilities by Calhoun, Sandow and Hunter (2010) when 45 minutes a day, five days a week, for 26 weeks, remedial reading instruction was given for approximately 97 hours. The achievement gain score was assessed using reading subtests of the Woodcock Johnson-III, the Gray Silent Reading Test, and Oral Reading Fluency passages. Results showed that students in the Additive module outperformed students in the Alternating and Integrated modules on phonological decoding and spelling and students in the integrated module on comprehension skills. The findings for the two oral reading fluency measures demonstrated a differential pattern of results across modules.
From these research studies it is evident that the struggling readers need to be provided early reading intervention through phonics instruction and text reading in a small group. Hence, the research took cognizance of the suggestions of these researches and provided strategic orientation to students at risk of dyslexia in a small group.

Erkan, Kızılaslan and Dogru (2012) conducted a case study on Turkish dyslexic learner difficulties in learning English as a foreign language. Data was collected from the dyslexic learner through observation, interviews and analysis of documents including student work, assignment sheets and exam papers over of six weeks. The participant benefited greatly from positive teacher support and special teaching techniques and methods used. The effective practice of inclusive education and pre-service and in-service teacher education programs will enhance language learning.

Naureen, Sultana, and Bakar (2011) conducted a case study on a 5th class student of Islamabad Model College for Girls. Tests like Reading Test, Writing Test, Mathematical Test, Memory Test, Intelligence Test, Performance Test; and Visio-Attention Test were administered. The dyslexics study progress and behavior in school and classroom was assessed. The suggestion given by the investigator was that a dyslectic child can be active participant in academics with the help of positive from parents and teachers. Regular Speech therapy and psychiatrist sessions were also recommended.

A Case analysis of family, social, medical, developmental, and academic status of a 7-year-old dyslexic boy’s was analysed by Oviedo and González (2013). The diagnostic report showed an inconsistent performance in written language as well as reading. The investigator implemented a need based intervention program based on individual attention, structured and focused on reading and writing. The intervention was designed using multisensory approach and implemented for 30 weeks. The result showed that the student achieved significant improvement in both reading and writing.

Training on letter-speech sound associations was given to improve reading fluency in children with dyslexia by Tijms et al. (2015). The researcher found lack of fluency in reading a major problem for dyslexics. He attempted an intervention through letter speech sound association to improve reading fluency. The results of interventions
showed there was an improvement in fluency. The researcher suggests that early automatic letter-sound associations will result in good reading fluency in dyslexia. The study indicates that training in grapheme-phoneme correspondence improved the oral reading fluency of dyslexics. The present study incorporated orientation in letter-sound association to enhance reading fluency of the students at risk of dyslexia.

The Effectiveness of the Intervention Program on Reading Fluency and Reading Motivation of Students with Dyslexia was enumerated by (Mihandoost, Elias, Nor and Mahmud, 2011). The researcher conducted an experiment with 64 students with dyslexia in Iran. Random sampling method was adopted and equally distributed to the control and experimental groups respectively. The Barton intervention program was given to treatment group for three months. The Reading Motivation Scale and Reading Fluency Test were administered as pre-test and post-test. The analysis of the finding showed Barton intervention program was more effective in creating reading motivation and enhancing reading fluency. The researcher of the present study incorporated the suggestions of the study and included motivation as yet another technique in developing the strategic intervention.

That risk factors for dyslexia can be screened at preschool level, was assumed by Helland, Plante and Hugdahl (2011). A questionnaire was administered to caretakers of one hundred and twenty 5 year olds children. The risk index score was calculated for the language acquisition. It was concluded with the identification of children at age 5 who will have severe dyslexia in the near future. It is necessary to remediate them with appropriate intervention at the pre-school stage. The study emphasises the need for earlier identification and appropriate remedial reading intervention for children at risk of dyslexia.

Measures of literacy, phonological and verbal skills, non-verbal ability, problem behaviour scales and cognitive interference were assessed on eighty three dyslexics, dyspraxics, and children with specific language difficulties, moderate learning disabilities, and attention deficits. Everatt, Weeks and Brooks (2008) indicated that individual measures were relatively poor on all the measured variables. It was
identified from the study that dyslexics have persistent difficulty in phonological awareness.

A battery of ten tests: Letter Naming, Word Reading, Non-word Reading, Spelling, Passage Reading, Reading Comprehension, Listening Comprehension, Elision, Rapid Letter Naming and Digit Span in Malay were constructed by Lee (2008). Content validity and Concurrent validity was established. Evidence of predictive and construct validity was obtained through regression analyses and factor analyses. Factor analysis revealed four factors: phonological decoding, phonological naming, comprehension and verbal short-term memory. He found that similarities in the theoretical constructs of reading-related tasks in Malay and in English and Phonological awareness were the most significant predictor of word-level literacy skills. The dimensions of the tool were taken to assess the reading performance of students at risk of dyslexia in the present study.

2.3 Studies Conducted in India

In an explorative research, Shukla and Agrawal (2015) explored the knowledge and awareness of learning disabilities among teachers of primary schools. It was found out that the knowledge and awareness was low from the responses of sixty eight primary school teachers in fifteen schools in Haridwar region, selected through a lottery method. A similar study was conducted by Gandhimati (2010) in eighty schools in Triuverumbur block, Tiruchirappalli. Sixteen schools were selected based on a lottery method. It was enumerated that 66.2% of primary teachers have low awareness about learning disabilities.

The effectiveness of visual auditory kinesthetic tactile (VAKT) technique on reading level among dyslexic children was examined by Jeyasekaran (2015). The researcher adopted a Quasi-experimental one-group pre-test post-test. Purposive Sampling technique was used as a sample selection technique. Thirty students with dyslexia were given remedial intervention through VAKT technique for 30 consecutive days. It if found that the VAKT technique is significantly effective in improving the reading level among children with dyslexia.
A cross-sectional research method carried out in two phases was conducted by Arun, et al. (2013) to find out the existence of students with dyslexia on scholastic skills of classes 7th to 12th. The academic performance of all the students was taken from class teachers and the marks obtained by the dyslexics. Tests of intelligence (Malin’s Intelligence Scale for Indian Children and Standard Progressive Matrices), and NIMHANS Index for specific learning disability (SLD) battery were administered to obtain the data. The collected data revealed that boys were identified with dyslexia more than girls. The study also recommended the teacher to utilise the screening instrument of suspect students with specific learning disability in future.

The effectiveness of computer assisted cognitive training (CACT) as an education based remedial training (EBRT) for the children with Reading, Spelling and Arithmetic disorder was examined Nisha and Kumar (2013). The participants in this study were 10 children aged between 8 and 15 years old with learning disabilities. The training conducted for the duration of 2 months and 8-12 sessions per day by using NIMHANS SLD index, to identify the LD. The study was not statistically significant due to the smaller sample size. The utilisation of CACT supported with EBRT resulted in improvement in spelling ability.

The Spastic Society of Karnataka (2004) analysed the impact of Computer Aided Learning (CAI) on children with specific learning problems in rural elementary schools of Karnataka. The aim of the study was to assess the effectiveness of computers in enhancing learning for children with learning disabilities. The participants were all the students from class two, three, four and five in the selected schools. A total of 70 participants were carefully identified and ruled out for any signs of visual, hearing, or motor disabilities, or mental retardation. Interviews were conducted with the class teachers and the children with LD observed. The impact of the CAI was more on certain concepts taught through Computer.

An experiment was conducted to study the effect of Remedial Teaching Programme on the Learning outcome of Dyslexic students by Zeenat and Dandegoankar (2014). The Experimental group was given a Remedial teaching involving the following :1- Phonetics, 2- Vowels, 3 – Short and Long Vowels, 4 –
Combination of Vowel, 5 – Four Five Letter words, 6 – Words with Common Suffixes/Prefixes, 7-Words with Common Suffixes Prefixes, 8 – Words with Common Suffixes and Prefixes, 9 – Polysyllable Words and Sentence Formation. A total of 36 students from different English medium schools of Aurangabad city participated in the study and were assigned randomly to both the groups. The findings showed that there was a Positive effect of remedial teaching programme on the Learning outcome of English medium students.

The factors responsible for the development of dyslexia were identified by Reghu, et al. (2014). The study identified the following the components as factors that signify the symptoms of learning disabilities like, difficulty learning the alphabet, sound-symbol correspondence, rhyming words, syllables in words, blending sounds to make words, naming problems, decode words, Confusion with before/after, right/left, over/under. From this study the items were taken for the development of the screening tool.

The variables influencing the knowledge of elementary school teachers towards dyslexia were assessed by Shetty and Rai (2014). A total of 314 teachers from 32 schools were participated in the study. The teacher’s responses were assessed based on 12 signs and symptoms of dyslexia. It was found out that 262 teachers were aware of the term dyslexia, but only 24 teachers had prior training. Only 1 in 3 teachers had adequate knowledge of dyslexia. Almost all the minority teachers had adequate knowledge of dyslexia. There existed a positive correlation on Teaching experience, prior training and exposure with knowledge of dyslexia. The study concluded that awareness and knowledge among elementary school teachers is poor.

Chatterjee, Kar and Awasthy (2014) examined 90 children with 30 good readers at grade one on word and non-word reading, and phoneme deletion in Hindi and English. Reading accuracy of the dyslexics was better for Hindi compared to English. Reading accuracy for words and non-words was equally adequate for Hindi whereas words showed an advantage over non-words for English among normally progressing readers. Normal readers as well as dyslexics may use lexical processing strategies for word recognition. On the whole, Dyslexics performed poor on all the tasks in both
languages. The study helps to understand the reading problems faced by the dyslexics and the strategies to teach word recognition to these students.

The challenges faced by teachers in handling dyslexia children were identified by Basu, and Beniwal (2014). Thirty seven teachers handling children with dyslexia participated in the study. It was conducted at government and private schools of the Delhi region. Focused group interview design along with filling of the questionnaire was adopted to answer the research questions. A semi-structured questionnaire was developed to explore the challenges faced by the teachers in the class of children with dyslexia. The responses of the teachers indicated that teachers lacked essential knowledge needed to teach struggling readers with dyslexia.

The reading errors of 30 dyslexics were examined by Gupta and Jamal (2006). The students with dyslexia ranging from 90 months to 6 months participated in the study. Reading errors were 60% phonological; 15% orthographic; 25% mixed; and 0.38% unrelated in Hindi and English, respectively. The learning problems in their second language were also found in the first language. It is evident from the study that dyslexics had difficulties in phonological awareness skills. The present study took cognizance of the findings and oriented students to develop their phonological awareness skills.

Remedial instruction was given to solve the problems of Tamil Dyslexic and dyslexics from rural areas by Paramadhyalan, et al. (2009). Tamil dyslexics were diagnosed on observing the reading components like Phonics, Common phonograms, Reading Fluency, Vocabulary and Comprehension. The researcher suggested phonics method of teaching reading to enhance the Reading Fluency constituents such as Sight Words, Automaticity and Repeated Reading. The suggestions were incorporated in the present study.

Emotional problem and academic achievement of learning disabilities of primary school children of third and fourth classes in English medium schools was explored by Heena Afreen M. Dilshad (2006). The prevalence of learning difficulties ranged from 17-20 percent in the selected school. The rate of prevalence was 18 per cent in case of learning difficulties and 4 per cent in case of learning disabilities. In
contrast, boys had 2-4 times more learning difficulties than girls with learning disability.

The frequency of phonological processes occurring in the speech of Telugu speaking children with dyslexia was investigated by Patlolla, Venkatesh and Ravindra (2012). Six years old dyslexics participated in the study. The study found out the phonological processes in their speech as well as reading was increasing day by day. The investigator suggested that these students be considered special needs children for education and appropriate remediation to be developed and implemented.

Karande (2007) evaluated the impact of an educational intervention and investigated parental knowledge of SpLD. Fifty English speaking parents were interviewed and a structured educational program was implemented subsequently. A re-interviewed was conducted after 3 months of the intensive intervention. The pre and post intervention responses were compared using Chi-square test. The statistical analysis confirmed that there was significant improvement in parental knowledge on SpLD and the educational programme had improved the parent knowledge on learning disabilities.

A case study was conducted by Sharma (2010) with a 15 year old dyslexic girl studying in class IX. She had problem in identifying difficult words, inability to interpret words in terms of ideas, often did guesswork in reading situation, had marked reversal tendencies, inability to identify main ideas if she were to speak loudly. Inventories like visual discrimination-letter, word and number discrimination, and auditory discrimination indicated that the case had poor performance in visual discrimination was administered and identified that the subject was unable to differentiate between two or more forms such as objects, written letters or written words.

The identification of reading disability, and classroom management of the children with learning disabilities was examined by Ravi (2013). At the primary level they may substitute, omit, add, reverse, transpose, and/or mispronounce letters or words. In India awareness regarding dyslexia is mostly confined to metro cities such as Mumbai, Delhi, and Kolkata. Other parts of the country still have large population who
are not aware of it. The teacher needs to be a good observer and identify learning disabilities at an early stage. The items were selected for the screening tool development.

A Survey on Learning disabilities was conducted in the southern part of India by Mogasale, Patil, Patil and Mogasale (2011). The survey showed that nearly 15.17% of sampled children were identified as LD of which 11.2 % had dyslexia, 12.5% dysgraphia and 10.5% had dyscalculia. Annual Status of Education Report (ASER), 2012 indicates that in standard III 26.2%, in standard IV 17.6% and in standard V 12% students can read only letters but not more. The report indicated a huge percentage of children in the education system in India was not able to read most at the basic level in their mother tongue.

The knowledge of learning disabilities (LD) among teachers in India was measured by Saravanabhavan and Saravanabhavan (2010). The study adopted a survey method and 144 teachers in two regular high schools, 38 teachers in two special schools, and 165 pre-service teachers in a teacher education college in a metropolitan city in a southern state in India were the participants in the study. ANOVA showed that the knowledge level of learning disabilities among teachers working in regular schools was statistically different. The study recommended that the knowledge level of learning disabilities among pre-service teachers in India must be improved.

Satish et.al., (2010) recommended a multisensory method of teaching to LD will offer effective instruction. Their study suggested a planning attainment with extra inputs and remedial training outside the school hours. They recommended, remedial programme should be Structured, Sequential and Cumulative.

Neuropsychological remediation programme was developed by Sadasivan (2009) to improve reading of dyslexics. Twenty children from Classes 5 to 7 were randomly allotted to one of two treatment conditions. All children were assessed on reading, phonological awareness tests and neuropsychological tests before and after intervention. The results indicated that the children with reading disorder taught with neuropsychological remediation programme differed significantly from the control group on reading abilities.
Gopalan and Kumar (2013) attempted to look into the ways learning disabled are handled in our class rooms. Eight teachers were interviewed with the help of their responses to a set of six open ended questions. Three basic themes emerged from analysis of participants’ responses: identification of LD learner, LD learner in the classroom and teacher training. It was concluded that the identification strategies adopted by teachers lacked scientific support. The teaching strategies suggested by these teachers were in accordance with the literature collected. All the teachers highlighted the pitfalls in the ongoing training programmes but stressed the importance of training by effectively addressing learning disabled in the regular class.

The existing educational policies in India were reviewed by Veera Gupta & Richard Whitehead (2014) to include learning disabilities students. Veera et.al., argued the need to formulate policy and Procedures as found in other developed countries. In 2012 the disability bill was the first time that SPLD has found place in the national draft policy. The bill is yet to be passed by the parliament of India. But there are a few government schemes for disable children. These are Sarva Shiksha Abhiyan (SSA 2003) and Inclusive Education for Disabled at Secondary Stage (IEDSS 2009). SSA has included SpLD in its training manuals. It has provided guidelines for the assessment of SPLD.

The Washington summit on SpLD in 1994 (RCI) has found that 10 to 30 percent children are LD in any school going population. The same was supported by Dilshad (2006). Learning disability can be found from class IIInd onwards when a child is expected to read and write (Marshall, 2009). It is evident that the SPLD population is approximately ten to twenty percent of the population. At present India has 199.7 million children in the elementary stage (NUEPA, State Report Cards 2011-12, 2012). It means that approximately 39 million children could be SPLD and could be suffering in the classes.

An attempt was made to analyse the inclusion of children with special needs in general schools in Puducherry by Vidhyananthan and Devan (2013). In which they found 557 learning disability students were identified by the Directorate of School Education Puducherry in collaboration with National Institute for Empowering Persons
with Multiple Disability. (Annual Report 2010-2011 Sarva Shiksha Abhiyan, Directorate of School Education. Government of Puducherry). On the whole Sarva Shiksha Abhiyan in Puducherry UT has Inclusion Of Disabled Children in General Schools in Puducherry which enhanced the condition of Children with special needs and provided barrier free infrastructure, aids and appliances and special teachers to understand the learning needs of disabled children in a diversified classroom.

The spelling skills in children with and without learning Disability in English and Bengali were evaluated by Rout and Banik (2014). This study also developed a simple tool to identify children having a risk of spelling difficulties. The participants included 60 children in the range of (8-11) who were divided into two groups. The task assigned to the Learning disability student was to identify the first and the last grapheme of a read out word in English and Bengali. Children with SLD performed poorly in both languages compared to the age matched peers in English and Bengali. A series of factors like phonological awareness, visual storage, orthographic knowledge, morphological knowledge, cognitive abilities and instructional techniques were considered to be responsible for the poor performance of the children.

SpLD was diagnosed on the basis of psycho-educational testing and observation. Karande, et al. (2007) conducted an observational study to diagnose children with SpLD. The participants were 34 boys, and 16 girls with reading problems. The result highlighting the academic problems were difficulties in writing (96%), inattentiveness (96%), difficulties in mathematics (74%), hyperactivity (68%) and difficulties in reading (60%). Therefore Children with SpLD need to be identified at an early age to prevent poor school performance and behavioural problems.

Thirty fourty primary school teachers in Puducherry region participated in a study conducted by Lingeswaran (2013). The observation research method was adopted to assess the knowledge of learning disability among primary school teachers in India. The results of this study showed that the fund of knowledge of primary school teachers on SLD was only 29% of the representative sample, which indicates poor knowledge. Similarly the prevalence of SLD among the students was unknown as a result teachers face lesser need to acquire knowledge on SLD and its management
The socio-demographic characteristics of learning disability were studied by Martina, Kumari and Bhuvaneswari (2014). A total of 329 primary school students were the participants in the study. Purposive sampling method was adopted to select the sample. The tools utilised for the study was a Grade Level Assessment Schedule to identify the children with learning disability. It was found out that the 43% of the selected participants had problems in reading (dyslexia), 17% of the selected participants expressed problems in writing (dysgraphia), 40% of participants had problems in mathematics (dyscalculia).

A cross-sectional multi-staged stratified randomized cluster sampling study was conducted by Mogasale, et al. (2012). The children aged 8-11 years from third and fourth standard were the sample in this study. The prevalence of specific learning disabilities was 15.17% in selected participants, whereas 12.5%, 11.2% and 10.5% had dysgraphia, dyslexia and dyscalculia respectively. Therefore the study suggested that the prevalence of SpLDs is on the higher side of previous estimations in India. As a consequence of the above finding the researcher recommends that the need for more prevalence studies, remedial education and policy interventions to manage SpLDs at mainstream educational system to improve the school performance in Indian children.

National Council for Educational Research and Training (NCERT) and SSA with support from United Nations Children’s Fund (UNICEF) conducted National Achievement Survey (2014) all over India. The Survey measures the language achievement of Third class students. The language achievement was assessed on three components. They were, (i) Listening, (ii) Word Recognition and (iii) Reading Comprehension. It was found that Pondicherry has achieved 73 percent on language achievement and 71 percent overall national progresses in language achievement.

Dyslexic students exhibited poor academic performers in a study conducted by Gafoor and Remia (2013). The participants in the study were given 45 academic tasks. Of these 19 to reading 10 to writing and 16 to arithmetic. The tasks consisted of ordering words according to alphabet, identifying incorrect spelling involving but not limited to glides, spelling of simple vocabulary, and use of symbols for vowels.
Krishnan (2012) developed a Multimedia Package for primary school students with Dyslexia and Reading Miscue Inventory (RMI) to identify the reading errors and a standardised Reading Assessment Test (RAT) to compare the extent of Dyslexia among the upper primary school students based on their Gender, Locality, Nature of school, Economic status and Type of the family. Analysis of data revealed the need of training for the upper primary school students with Dyslexia. Based on identified needs of Reading Miscues and Learning Styles, a Multimedia Package (MMP) was prepared and the students were provided the experiential training. MMP was used to minimise Reading Miscues viz. Omissions, Substitutions, Reversals, Additions, Repetitions, Mispronunciations and Refusals among upper primary school students with Dyslexia. Purposive Sampling technique was adopted to select 76 students for an experiment. The findings showed that the MMP was effective in minimising the Reading Miscues such as Omissions, Substitutions, Reversals, Additions, Repetitions, Mispronunciations and Refusals among upper primary school students with Dyslexia.

The computer must be used as an instructional medium in teaching reading to primary school children with reading difficulties’ as argued by Balasubramanian (2001). The CAI software must concentrate on drill, practice, tutorial, games, simulations and teacher utilities. The study concluded that CAI can result in a number of positive benefits when used for developing reading skill among children at the primary level.

Bose (1996) studied the effectiveness of using computer-based learning materials - cum-methods and traditional materials for overcoming specific learning disabilities. The sample of the study comprised 60 LD children from 6 Delhi schools with computer facilities. The collected data was treated with non-parametric statistical methods. The study resulted with a gain for the experimental group than the control group in English by 7%. The experimental group gained more than control group in maths by 5%. Therefore Computer based learning resulted in enhancement of performance in English and the Experimental group showed higher gains than the control group.
The evidence of a consistent pattern in specific dyslexia which does not depend on any one writing system or geographical location was argued by Ramaa, Miles and Lalithamma (1993). To prove this the researcher investigated the performances of 14 dyslexic children, aged between 8 and 10 years, whose native language was Kannada, and were compared on a variety of tasks with fourteen normal readers and fourteen non-dyslexic poor readers. There were no significant differences between the three groups on tests of visual discrimination, visual recognition, visual recall, memory for shapes in sequence, or auditory discrimination. There were differences, however, between the dyslexics and the normal readers on tests of recall of auditory presented digits, word analysis, word synthesis, and on two tests of visual-verbal association. The non-dyslexic poor readers were more similar to the dyslexics on recall of auditory presented digits and word synthesis but more similar to the normal readers on word analysis and on the two tests of visual-verbal association.

Reading difficulties on English in Periyanaickenpalayam was diagnosed by Shankar et.al. (2010). The objectives of the study were to find out the level of reading difficulties faced by 8th standard students with respect to gender. It is found out that 69.53% student possessed greater reading difficulties. 30.47% students possessed less reading difficulties. 51.55% boys possessed reading difficulties, 48.45% girls possessed reading difficulties. This study highlighted that boys had more problems in reading ability.

Remedial programme to improve the word-recognition skill and reading comprehension skill of low achievers in reading was tested by Geetha (2002). The effectiveness of the remedial programme was implemented by survey-cum-experimental method. The remedial programme developed in the study was found to be more effective than conventional lecture-demonstration methods.

Two decades of research on learning disabilities in India was traced by Ramaa, S. (2000) traced. Most of the studies carried out in India were identification of different types of learning disabilities or any one type of learning disability. Some studies were done in Kannada, Malayalam and Hindi. Since English is one of the compulsory languages in Indian schools, work has also been initiated in Primary Schools to identify
children with learning disabilities in English in Indian primary schools. In India, identification and diagnosis of learning disabilities is very difficult because ready-made standardized tools are not available in all languages. There is an urgent need to develop standardized teacher-made assessment instruments in the different languages and to establish norms.

The reading errors of dyslexic children in Malayalam were identified by Ramaa (1985) in Kannada by Bindu (1996). They used a word recognition test in their vernacular languages. The major types of error in both the languages were word substitution, letter substitution, ‘Kagunitha’ (different consonant and vowel combinations), blending errors and reversal errors. This identification provoked them to attempt to identify sub-categories of errors within each major category. They also found that the errors of dyslexics did not differ qualitatively from those of non-dyslexic poor readers but the main difference was in frequency and persistence.

The profile for acquisition of reading and writing of dyslexics in Kannada was developed by Prema (1997). A total of 150 reading disabled children were the participants in the study. Linguistic Profile Test comprising items for phonology, syntax and semantics, a meta-phonological test with words and non-words, a reading and writing test with hierarchically graded items, and a reading comprehension test with passages and stories, were administered. The result of this longitudinal study, stressed the importance of meta-linguistic skills, knowledge of orthographic principles and reading comprehension skills needed to be trained intensively in the early school years.

Prakash and Sunita (1998) assigned the tasks like rhyme recognition, phoneme oddity detection, phoneme deletion, syllable deletion, syllable reversal, a serial (sequential) recall test, identification of body parts, repeating polysyllabic words, a visual retention test and a test of knowledge of orthographic principles to the sample. Sixteen reading disabled children of Grade IV were compared with 16 normal readers of Grade IV and five matched normal readers of Grade II. They found that the dyslexics performed worse on most of the tasks than did either of the other two groups.
Ramaa (1985) improved the children’s knowledge of grapheme–phoneme correspondence and their word analysis and word synthesis skills. She developed a remedial instruction programme in Kannada for dyslexic children in primary schools for improving their reading skills. The programme was based on important principles of teaching reading to dyslexic children such as a multisensory approach, continuous evaluation and feedback, etc. She validated the effectiveness of the remedial programme by experimenting with six dyslexics with a single case pre-test, post-test design. The programme was administered individually to the children in 16–20 sessions of 30 min duration. All of them improved in their accuracy of word recognition skills after the experiment.

The effectiveness of task-oriented approach in improving the reading skills in English of 25 children with reading disabilities in Karnataka was examined by Rozario, Kapur and Rao (1994). The remedial programme involved a task-oriented approach. The target was to improve basic sight words and phonic skills. The treatment, which was given over 25 sessions, was found to be effective in improving the reading skills of dyslexic children.

The attention, phonemic processing, working memory and semantic processing of the students at-risk of reading disabilities was investigated by Akila (1997). The study involved a pre-test post-test control group design. Four children participated in the experimental group and four children in the control group from Grades VII–IX. The experimental group was administered study for 30 sessions of 30–60 min each. The subjects of the experimental group were given such tasks as fluency, rhyming, digit span, digit symbol substitution, naming, phonetic recognition and continuous performance tasks. The programme was effective in improving the accuracy of reading but not the rate of reading.

Poor Scholastic Performance and its Relation to Specific Learning Disabilities among School Children in Mysore was studied by Manjunatha, Revathi Devi, Manu Suresh Sharma (2014). The researcher adopted Simple Random Sampling method to select the sample for the study. The sample was selected from Government and semi-aided schools in Mysore. The researcher administered NIMHANS Index to identify the
Specific Learning Disability (SpLD). On assessing learning parameters it was found that the performance of the SpLD in normal subjects, number of mistakes, omissions and correct cancellations increased as the standard of the subject increased.

2.4 Highlights of the Related Studies Conducted in Abroad

The researcher highlighted the major insight gained from the related studies in abroad which were incorporated in the present investigation.

Table 2.T.1: Insight Gained from the Related Studies Conducted in Abroad

<table>
<thead>
<tr>
<th>S. No</th>
<th>Authors</th>
<th>Concepts / Methodology / Components / Intervention Focus</th>
<th>Findings and Implications</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Watts and Paul Gardner (2013)</td>
<td>‘Look and Say’ intervention for five-week focusing on Synthetic phonics and the teaching of high frequency words (HFW)</td>
<td>‘Look and say’ approach improved HWF for the majority of pupils. It is recommended, HFWs should be integral part of teaching.</td>
</tr>
<tr>
<td>2</td>
<td>Margaret, Snowling and Charles Hulme (2012)</td>
<td>Interventions to promote reading and language skills evaluation</td>
<td>Interventions for dyslexics were effective on letter–sound knowledge, phonological awareness and reading practice.</td>
</tr>
<tr>
<td>3</td>
<td>Noel Chia Kok Hwee and Stephen Houghton (2011)</td>
<td>Sample: 77 primary school-aged children with dyslexia pre-test/post-test experimental group design Duration: 100 hours of reading intervention OG-based instruction</td>
<td>There is significant improvement in the word recognition of children with dyslexia when taught through OG-based instruction.</td>
</tr>
<tr>
<td>4</td>
<td>Meree Reynolds, Kevin Wheldall &amp; Alison Madelaine (2011)</td>
<td>Systematic and effective instruction was given to small groups for enhancing phonemes with the associated letters. Intervention Duration- 30 minutes &amp; more than 20 hours.</td>
<td>Focus of Reading Intervention: letter-sound Association and sight word recognition.</td>
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<tr>
<td></td>
<td>Authors</td>
<td>Intervention Focus</td>
<td>Sample/Experiment</td>
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<tr>
<td>5</td>
<td>Wendy Moore and Lorraine Hammond (2011)</td>
<td><strong>Intervention Focus</strong>: phonemic awareness, letter-sound knowledge, blending, segmenting and book reading</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>Snowling and Charles Hulme (2011)</td>
<td><strong>Intervention Focus</strong>: phonological awareness (PA) and contextual reading (CR)</td>
<td>Combined programme (CR+PA) gained effectiveness in 5 months</td>
</tr>
<tr>
<td>7</td>
<td>Reynolds, Kevin Wheldall and Alison Madelaine (2010)</td>
<td><strong>Intervention Focus</strong>: synthetic phonics to teach Phonemic awareness and phonics combined with letter-sound correspondences, Phonological awareness, phonics, fluency, text reading, vocabulary, sight words and comprehension.</td>
<td>Sample: 30 minutes &amp; more than 20 hours. Duration: 20 to 30 minutes per day, over 10 weeks</td>
</tr>
<tr>
<td>8</td>
<td>Dominic Wyse &amp; Usha Goswami (2010)</td>
<td><strong>Intervention Focus</strong>: Phonological decoding combined with word recognition.</td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>Gary Woolley (2010)</td>
<td><strong>Identification</strong>: Teacher ratings Scale to identify At risk of Dyslexia. <strong>Assessment Areas</strong>: Phonological skill, word recognition ability, rapid naming speed, phonological awareness, vocabulary knowledge, listening and reading comprehension.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Authors</td>
<td>Intervention Focus</td>
<td>Duration/Details</td>
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<tr>
<td>10</td>
<td>Torgesen, et al. (2010)</td>
<td><strong>Screening</strong> At Risk of Dyslexics: letter-sound knowledge of first grade level</td>
<td>Duration: 80 hours for small group instruction supported with technologies</td>
</tr>
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<td></td>
<td></td>
<td><strong>Intervention:</strong> phonological awareness, reading accuracy and rapid automatic naming</td>
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<td>11</td>
<td>Rasinski, et al. (2009)</td>
<td><strong>Intervention Focus:</strong> Modelling fluent reading paired reading, neurological impress reading &amp; audio-assisted reading</td>
<td>Duration: 10 to 15 min per day</td>
</tr>
<tr>
<td>12</td>
<td>Bailet and colleagues (2009)</td>
<td><strong>Intervention Focus:</strong> Rhyming, alliteration, picture naming, print and letter knowledge skills of 220 at-risk for reading problems students at pre-kindergarten.</td>
<td>Duration: 30-minute sessions, twice a week for 9 weeks</td>
</tr>
<tr>
<td>13</td>
<td>Mary Wild (2009)</td>
<td><strong>Intervention Focus:</strong> phonological awareness skills of beginning readers supported with computer aided instruction.</td>
<td></td>
</tr>
<tr>
<td>14</td>
<td>William, Rupley, Timothy R. Blair &amp; William Nichols (2009)</td>
<td><strong>Intervention Focus:</strong> Phonemic awareness, phonics, fluency, vocabulary, and comprehension Reading practice Teacher-directed explicit practice in reading text</td>
<td></td>
</tr>
<tr>
<td>15</td>
<td>De Graaff, et al. (2009)</td>
<td><strong>Intervention Focus:</strong> Systematic phonics approach compared with a non-systematic approach supplemented with computer-based phonics programs. <strong>Duration:</strong> Experiment Design 15 sessions of 15 min - period of 5 weeks</td>
<td>The experimental group progressed on productive letter sound knowledge than that of control group</td>
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<tr>
<td>16</td>
<td>Torgesen, Foorman &amp; Wagner (2008)</td>
<td><strong>Intervention Focus:</strong> Phonemic awareness, phonemic decoding, and text reading accuracy and fluency of reading difficulties in English. <strong>Duration:</strong> 20 minute a day for five week</td>
<td>Recommended small group instruction for At-risk students are effective than that of larger group.</td>
</tr>
<tr>
<td>17</td>
<td>Duff, et al. (2008)</td>
<td><strong>Intervention Focus:</strong> Phonological processing with vocabulary instruction <strong>Duration:</strong> Nine-week with 15-minute-per-day <strong>Research Design:</strong> Experimental and control Group <strong>Sample:</strong> 11 eight-year-old students</td>
<td>The treatment group scores on phonological tests in post-test and delayed post-test were increased.</td>
</tr>
<tr>
<td>18</td>
<td>Ryder, Tunmer and Greaney (2008)</td>
<td><strong>Intervention Focus:</strong> phonemic awareness and phonemically based decoding skills <strong>Research Design:</strong> Experimental (N= 12) and control Group(N= 12) design <strong>Sample:</strong> 6- and 7-year old children who were struggling with reading</td>
<td>Students who received intervention outperformed the control group on phonological awareness.</td>
</tr>
<tr>
<td></td>
<td>Authors</td>
<td>Intervention Focus</td>
<td>Research Design</td>
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</tbody>
</table>
| 19| McIntosh, Crosbie, Holm, & Dodd (2007) | **Intervention Focus:** Letter naming and Phonological awareness  
**Research Design:** Experimental and control Group design  
**Sample:** 97 At risk of poor reading ability from 3rd grade  
**Duration:** one hour per day for 20 weeks | Phonological awareness programme highly effective in raising emergent literacy skills. The delayed post test reciprocated the result of post-test. |
| 20| Magnan, Jean Ecalle (2006) | **Intervention Focus:** phonetic feature Audio-visual training with computer  
**Research Design:** Experimental and control Group design  
**Sample:** At risk of dyslexics at kindergarten  
**Duration:** 20 minutes for five weeks | The treatment group outperformed in phonological skills and phonological recoding than that of control group. |
| 21| Steven A. Stahl (2006)   | **Intervention Focus:** phoneme awareness Phoneme identity, Letter-sound correspondences  
**Research Design:** Experimental and control Group design  
**Sample:** 6 year old children at risk of dyslexia  
**Duration:** 20 min per day for 30 days | Contextual reading using supported and repeating readings  
Echo positive reading efforts. |
| 22| Hatcher, et al. (2006)   | **Research Design:** Experimental & Control Group  
**Intervention:** 20-week intervention for Struggling Readers  
**Duration:** 20-minutes for small group. | Significant gains was achieved by Students in the intervention group on reading performance when compared with control group |
<table>
<thead>
<tr>
<th></th>
<th>Author(s)</th>
<th>Intervention Focus</th>
<th>Research Design</th>
<th>Sample Description</th>
<th>Duration Description</th>
</tr>
</thead>
</table>
| 23| Vellutino, Scanlon, Small, & Fauente (2006) | **Intervention Focus:** Alphabet knowledge, Phonological awareness, Sight word reading and guided reading.  
**Research Design:** Experimental and control Group design  
**Sample:** 5 year old children at risk of dyslexia  
**Duration:** two times a week for a 30 minute session | | At risk children can significantly improve basic reading skills with intervention. |
| 24| Scanlon, et al. (2005)            | **Intervention:** One-to-one tutoring program on Phonological elements.  
**Duration:** 30 minutes each day | | One-on-one reading was more effective on enhancing Phonological elements. |
| 25| Johnston & Watson (2005)          | **Intervention Focus:** Analytic phonics, Synthetic phonics, Analytic & phonological awareness  
**Research Design:** three group experimental Study  
**Duration:** 16 weeks training in which daily 20-minute sessions | | Reading performance of Synthetic phonics group students’ were ahead of students in other two treatment groups. |
| 26| Giess (2005)                     | **Intervention Focus:** Letter-word identification, spelling, word attack, sound awareness and speed of sight-word reading.  
**Research Design:** Experimental and control Group design  
**Intervention:** Multisensory, Orton- Gillingham approach  
**Duration:** two times a week for a 30 minute session | | Treatment group showed consistent increase on the reading performance |
<table>
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<tr>
<th></th>
<th>Authors</th>
<th>Intervention Focus</th>
<th>Research Design</th>
<th>Sample</th>
<th>Duration</th>
<th>Results</th>
</tr>
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<tbody>
<tr>
<td>27</td>
<td>Pokorni, Worthington and Jamison (2004)</td>
<td><strong>Intervention Focus:</strong> Reading Fluency</td>
<td><strong>Research Design:</strong> Three group Experimental design</td>
<td><strong>Intervention:</strong> Fast ForWord, Earobics and LiPS programme</td>
<td><strong>Sample:</strong> 60 students reading deficits</td>
<td>Results demonstrated The effect size showed that the Earobics and the LiPS interventions improved the Phonological Awareness skills in the children with reading deficit</td>
</tr>
<tr>
<td>28</td>
<td>Justice, Chow, Capellini, Flanigan &amp; Colton (2003)</td>
<td><strong>Intervention Focus:</strong> Name writing, Alphabet knowledge, Phonological awareness</td>
<td><strong>Research Design:</strong> Randomly assigned Experimental and control group design</td>
<td><strong>Intervention:</strong> Reading Intervention</td>
<td><strong>Sample:</strong> 18 students reading problems</td>
<td>Stronger effect size seen after 6 week explicit intervention.</td>
</tr>
<tr>
<td>29</td>
<td>Lonigan, Driscoll, Phillips, Cantor, Anthony &amp; Goldstein (2003)</td>
<td><strong>Intervention Focus:</strong> Explicit intervention focus: Phonemic awareness Phonemic decoding. Embedded intervention focus: Reading sight words Letter-sound correspondences Writing sentences</td>
<td><strong>Research Design:</strong> Three group Experimental design</td>
<td><strong>Sample:</strong> 45 students with dyslexia.</td>
<td><strong>Duration:</strong> 15-20 minutes, 4 to 7 weeks</td>
<td>Computer-assisted instruction (CAI) has increased phonological awareness of students at risk of reading difficulties. Growth of post-test was significantly progressing for the intervention group on rhyme oddity, rhyme matching, word elision, and syllable/phoneme deletion tasks.</td>
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<td></td>
<td>Reference</td>
<td>Summary</td>
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<td></td>
<td></td>
<td>Assessment Area for Identification of Dyslexia: Phonological awareness, rapid naming (for letters), and oral vocabulary.</td>
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</tbody>
</table>
| 31 | Joshi, et al (2002) | **Intervention Focus:** Reading Fluency  
**Research Design:** Quasi-experimental design  
**Intervention:** Multisensory instruction with an Orton Gillingham (OG) program  
**Sample:** 54 poor readers at 1st grade.  
**Duration:** one hour per day for forty two days |
| | | The students of the treatment group performed better on tests of phonological awareness, decoding, and reading comprehension than that of control groups |
| 32 | Valerie Muter and Kay Diethelm (2001) | **Phonological awareness tasks:** Rhyme detection, Rhyme production, Word completion, Phoneme deletion and Alphabet letter knowledge.  
phonological screening instruments are effective to identify “at-risk” poor readers among children whose first language is not English. |
| 33 | Byrne, Fielding-Barnsley, & Ashley (2000) | **Intervention Focus:** Phonological Awareness  
**Research Design:** Control and Experimental group design  
**Intervention:** posters, games, worksheets and audiotape  
**Sample:** 103 students with poor reading at 5th grade  
**Duration:** 30 minutes per day for twelve weeks |
| | | Instruction in phonemic awareness at preschool level had “modest but detectable effects” on Grade 5 children’s reading. |
| 34 | Van Daal & Reitsma (2000). | **Intervention Focus:** initial reading and spelling skills  
**Research Design:** Control (N = 13) and Experimental group (N = 9) design  
**Intervention:** drill and practice-type programme  
**Sample:** 21 kindergarten children with dyslexia  
**Duration:** 30 minutes per day for twelve weeks |
<p>| | | post-test scores showed effectiveness when computer is utilised on letter knowledge and reading single words that that of control group. |</p>
<table>
<thead>
<tr>
<th></th>
<th>Torgesen, et al. (1999)</th>
<th><strong>Reading Intervention Focus:</strong> phonological awareness (Sound Matching, Sound Categorization, and Blending Phonemes), Rapid automatic naming ability, Letter-sound knowledge.</th>
<th>Needs systematic, explicit instruction in phonemic decoding skills. More than 20 minutes a day</th>
</tr>
</thead>
<tbody>
<tr>
<td>35</td>
<td><strong>Intervention Focus:</strong> Phonological awareness with or without explicit attention to articulation</td>
<td><strong>Research Design:</strong> Control and Experimental group design</td>
<td>Students achieved highly significant gains in the experimental group on all the reading-related tests</td>
</tr>
<tr>
<td></td>
<td><strong>Intervention:</strong> Computer assisted</td>
<td><strong>Sample:</strong> 122 two second- to fifth-grade children with reading difficulties</td>
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</tr>
<tr>
<td></td>
<td><strong>Duration:</strong> 40 hours of training</td>
<td></td>
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<tr>
<td>36</td>
<td>Torgesen, et al. (1999)</td>
<td><strong>Explicit intervention focus:</strong> Phonemic awareness, Phonemic decoding. <strong>Embedded intervention focus:</strong> Reading sight words, Letter-sound correspondences, Writing sentences</td>
<td>explicit intervention approach produced higher levels of growth in word level reading skills.</td>
</tr>
<tr>
<td></td>
<td><strong>Research Design:</strong> four group design</td>
<td><strong>Intervention:</strong> Computer assisted</td>
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<tr>
<td></td>
<td><strong>Sample:</strong> 138 young children with reading difficulties</td>
<td><strong>Duration:</strong> 88 hours of intervention</td>
<td></td>
</tr>
</tbody>
</table>
| 38 | Oakland, et al. (1998). | **Intervention Focus:** word recognition, and reading comprehension  
**Research Design:** Control and Experimental group design  
**Intervention:** Orton Gillingham Approach  
**Sample:** 22 students with dyslexics at 4th grade | Orton Gillingham-method trained students to attain gradual progress in reading. |
|---|---|---|
| 39 | Foorman et al. (1997) | **Intervention Focus:** reading fluency  
**Research Design:** Control and Experimental group design  
**Intervention:** synthetic phonics program, an analytic phonics program, and a sight-word reading.  
**Sample:** 114 students in Grade 2nd and 3rd Grade with reading disability.  
**Duration:** 60 min a day | The synthetic phonics group outperformed the analytic phonics group in phonological and orthographic processing and word reading. |
| 40 | Margaret A. Crombie (1997) | **Identification of dyslexic:** judged by class teachers,  
Dyslexics have serious difficulties in learning a foreign language.  
Comparison of Dyslexics and non dyslexics difficulties in learning a foreign language. | Dyslexic group have more difficulty with the phonological tasks of reading and writing.  
Analysis: one-tailed Wilcoxon signed-ranks test |
| 41 | Wilson & O’Connor. (1995). | **Intervention Focus:** word attack skills, word identification, word comprehension, and passage comprehension.  
**Research Design:** Pre-test and post-test Experimental Design  
**Intervention:** Orton Gillingham Approach  
**Sample:** 220 students with learning disabilities | Post-test data revealed significant gains in word attack (average increase of 4.6 grade levels), reading comprehension (average increase of 1.6 grade levels), total reading (average increase of 1.9 grade levels), and spelling. |
| 42 | Joseph K. Torgesen and Theodore A. Barker (1995) | **Intervention Focus:** phonological awareness tasks: (a) recognizing rhyming words; (b) matching words on the basis of similar first sounds; (c) matching on the basis of last sounds; (d) matching on the basis of middle sounds.  
**Sample:** At Risk Dyslexics: | Technology to support in normalizing the reading skills of children with learning disabilities. |
| 43 | Hatcher et al. (1994) | **Intervention Focus:** word attack skills, word identification, word comprehension, and passage comprehension.  
**Research Design:** Controlled four experimental condition  
**Intervention:** Reading and Phonology and combination of both  
**Sample:** 220 students with learning disabilities  
**Duration:** twice weekly for 20 weeks.  
**Dyslexia Identification:** screening by teachers | The outcomes of combined intervention were significantly better than that of those in the other groups for prose reading accuracy, nonword reading, spelling, and segmenting and blending. |
| 44 | Stoner, (1991). | **Intervention Focus:** word study, word reading, comprehension, and total reading  
**Research Design:** Quasi-experimental design  
**Intervention:** Project Read (OG) reading instruction traditional basal reading instruction  
**Sample:** students in one to three grades.  
**Duration:** twice weekly for 20 weeks.  
**Dyslexia Identification:** screening by teachers | The study showed significant differences on all subtests for the Project Read (OG) reading instruction group than that of control group |
## Highlights of the Related Studies Conducted in India

The researcher highlighted the major insight gained from the related studies conducted in India which were incorporated in the present investigation.

### Table 2.1: Insight Gained from the Related Studies Conducted in India

<table>
<thead>
<tr>
<th>S. No</th>
<th>Authors</th>
<th>Concepts / Methodology / Components / Intervention Focus</th>
<th>Findings and Implications</th>
</tr>
</thead>
</table>
| 1     | Jeyasekaran (2015) | **Intervention Focus:** reading skill  
**Research Design:** Quasi-experimental One-group pre-test post-test design  
**Intervention:** Visual, Auditory, Kinaesthetic and Tactile technique (VAKT)  
**Sample:** 30 students with dyslexics at primary level  
**Duration:** 30 consecutive days | VAKT is an effective method to improve the reading skill of the children with dyslexia. |
| 2     | Zeenat (2014) | **Intervention Focus:** Phonetics, Vowels, Short and Long Vowels, Combination of Vowel, Four Five Letter words,  
**Research Design:** Control and experimental group design  
**Sample:** 36 students with dyslexics at primary level were selected through Purposive random sampling | Remedial Teaching Programme enhances the learning outcome of the dyslexics in the experimental group |
<p>| 3     | Reghu, et al. (2014) | <strong>Problems of at risk readers:</strong> alphabet knowledge, Difficulty in producing correct pronunciation, rhyming words, to decode words , and Difficulty in distinguishing between similar sounds in words | At risk readers need appropriate instruction |</p>
<table>
<thead>
<tr>
<th></th>
<th>Authors and Year</th>
<th>Research Focus</th>
<th>Findings</th>
</tr>
</thead>
<tbody>
<tr>
<td>4</td>
<td>Shetty and Rai (2014)</td>
<td>School teachers knowledge of dyslexia</td>
<td>Awareness and knowledge of elementary school teachers is poor.</td>
</tr>
<tr>
<td>5</td>
<td>Chatterjee, Bhoomika, Kar and Awasthy (2014)</td>
<td>Dyslexics performed poor on Letter identification, reading speed and word reading, reading and spelling tests. <strong>Dyslexic Identification-Checklist</strong> by teacher</td>
<td>All the children identified with reading difficulties showed poor performance on their first language also</td>
</tr>
<tr>
<td>6</td>
<td>Basu, Poonam and Beniwal (2014)</td>
<td>Challenges faced by teachers to teach dyslexia</td>
<td>Lacked essential knowledge needed to teach struggling readers,</td>
</tr>
<tr>
<td>7</td>
<td>Chandra Basu, Poonam and Beniwal (2014)</td>
<td>Dyslexia performance was inconsistent in learning to read</td>
<td>Every teacher has at least one student or child with dyslexia in a class.</td>
</tr>
<tr>
<td>9</td>
<td>Gupta &amp; Richard Whitehead (2014)</td>
<td>Recommended to Identify learning disability from class IInd class onwards and suggested to develop policy</td>
<td>The expected number of SPLD could be approximately 40 million. At present only 0.1 percent students are being identified though the number could be 20 percent.</td>
</tr>
<tr>
<td>10</td>
<td>Nachiketa Rout, Arun Banik (2014)</td>
<td>Identify Children at Risk of Specific Learning Disability in Bengali and English in class III to V</td>
<td>SLD performed poorly in both the languages as compared to the age matched peers in both English and Bengali.</td>
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<tr>
<td></td>
<td>Author(s)</td>
<td>Description</td>
<td>Findings/Notes</td>
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</table>
| 12 | Ramar, and Jeyabalakrishnan (2013) | **Research Design:** Experimental Design  
**Sample:** 50 LD students using Systematic random sampling technique.  
**Intervention:** learning strategy.  
**Duration:** thirty working days. | Active Learning methodology is more effective                                                      |
| 13 | Arun, et al. (2013) | No screening tool available for teachers to identify SpLD.                                                                                                                                             | Learning Disabilities were 3-10 per cent among students population in a school. More boys diagnosed with specific learning disability |
| 14 | Nisha and Kumar (2013) | **Intervention:** Computer Assisted Cognitive Training (CACT)  
**Sample:** 10 Children with specific learning disorders (SLD) of ages of 8 and 15 years.  
**Research Design:** Control and Experimental Design  
**Duration:** 15 - 20 sessions for 3 – 5 weeks | Dearth of literature on the efficacy of computer based cognitive retraining in remediating developmental skill deficits such as reading.  
The use of CACT resulted in significant improvement in reading of the treatment group |
<p>| 15 | Ravi (2013) | Symptoms of dyslexia: Substitute, omit, add, reverse, transpose, and mispronounce letters or words.                                                                                                       | In India awareness regarding dyslexia is moderately high on metro cities such as Mumbai, Delhi, and Kolkata than other parts of the country. |</p>
<table>
<thead>
<tr>
<th></th>
<th>Author(s) and Year</th>
<th>Intervention Details</th>
<th>Research Details</th>
<th>Findings</th>
</tr>
</thead>
</table>
| 17 | Anilakumari (2012) | Intervention: Multimedia Remedial Tracking Package (MRTP) For Dysgraphia  
Research Design: Survey cum experimental method and One group Pre-test Post-test Design  
Sample: 39 students with dyslexia aged 8-10 years selected through Purposive sampling technique. | MRTP is effective in significantly minimizing Dysgraphia in overall aspects. | |
| 18 | Krishnan (2012) | Intervention: Multimedia Remedial Tracking Package (MRTP) For Dyslexia  
Research Design: Survey cum experimental method  
Sample: 76 students with dyslexia (Vth and VIth - English Medium Schools) through Purposive sampling technique. | reading achievement scores and retention capacity of Dyslexic students after the intervention of the Multimedia Package has improved. | |
Telugu speaking dyslexic | Children with dyslexia continued to demonstrate phonological processes in their speech even beyond six years of age | |
<p>| 20 | Grace Thomas &amp; Janet Whitten (2012) | Learning Difficulties in India And Australia: Comparison | Understanding of LD was low in India when compared with Australia | |</p>
<table>
<thead>
<tr>
<th>No.</th>
<th>Author(s) &amp; Year</th>
<th>Description</th>
<th>Key Findings</th>
</tr>
</thead>
<tbody>
<tr>
<td>21</td>
<td>Karande &amp; Gogtay (2010)</td>
<td>Early Identification of LD: primary school should start from class standards I-IV onwards compulsorily</td>
<td>5–15% of school-going children were identified as LD. Many parents cannot afford the services of special educators working in the private sector</td>
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<td>22</td>
<td>Bharti Sharma (2010)</td>
<td>Research Method: Case study of 15 year old dyslexics. Informal reading inventories. visual discrimination-letter. word and number discrimination were assessed.</td>
<td>Improvement in reading ability</td>
</tr>
<tr>
<td>23</td>
<td>Saravanabhavan &amp; Saravanabhavan (2010)</td>
<td>A survey on Knowledge of learning disabilities (LD) among teachers. 144 teachers participate in the survey</td>
<td>Recommendation to improve the knowledge level of learning disabilities among pre-service teachers in India.</td>
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<tr>
<td>24</td>
<td>Satish Chandra Girimaji and Preeti Kandasamy (2010)</td>
<td>Dyslexia - Assessment and Management Early interventions Phonological processing approach</td>
<td>Diagnose dyslexia as early as possible -“at risk” for dyslexia Needs remedial training outside the school hours</td>
</tr>
<tr>
<td>25</td>
<td>Sadasivan (2009)</td>
<td>Intervention Focus: phonological awareness syllable identification, visual rhyme, phoneme detection and phoneme deletion Research Design: Control and experimental group design Intervention: Phonological awareness Sample: 20 Students with dyslexia from Classes 5 to 7</td>
<td>Both the groups made significant gains on phonological awareness measures than that of control group.</td>
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<td></td>
<td>Authors</td>
<td>Title</td>
<td>Summary</td>
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<td>26</td>
<td>Paramadhyalan (2009)</td>
<td><strong>Teaching for Dyslexics:</strong> Sound-symbol correspondence, Phonics Reading Fluency (Sight Words, Automaticity &amp; Repeated Reading)</td>
<td>Teaching phonics combined together with the sounds of letters and their spellings.</td>
</tr>
<tr>
<td>28</td>
<td>Gupta and Jamal (2006)</td>
<td>Reading Errors in Hindi and English of 30 dyslexic readers Were identified as Phonological errors, Initial phoneme and Final phoneme</td>
<td>Dyslexics have similar difficulties both their first language &amp; second language.</td>
</tr>
<tr>
<td>29</td>
<td>Afreen M. Dilshad (2006)</td>
<td><strong>Research Design:</strong> Exploratory study</td>
<td>Boys were 2-4 times more learning difficulties / disability than girls. Needs intervention through proper remedial strategies.</td>
</tr>
<tr>
<td>30</td>
<td>Dilshad (2006) and Washington summit on SpLD in 1994</td>
<td>India have 199.7 million children in the elementary stage (NUEPA, State Report Cards 2011-12, 2012).</td>
<td>It means approximately 39 million children could be SPLD.</td>
</tr>
<tr>
<td>32</td>
<td>The Spastic Society of Karnataka (2004)</td>
<td><strong>Intervention:</strong> Computer Aided Learning</td>
<td>Computer Aided Learning has had a significant impact on the children with learning problems.</td>
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<tr>
<td>Page</td>
<td>Author (Year)</td>
<td>Intervention</td>
<td>Research Design</td>
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<td>33</td>
<td>Akila (1997)</td>
<td>Neuropsychological Remediation</td>
<td>Pre-test post-test control group design</td>
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</tbody>
</table>

List of Abbreviations with Expansions used in the study

- LD- Learning Disabilities
- SpLD- Specific Learning Disabilities
- OG – Orton Gillingham
- VAKT- Visual, Auditory, Kinaesthetic and Tactile
- MRTP- Multimedia Remedial Tracking Package
- CAI- Computer Assisted Instruction
- CACT- Computer Assisted Cognitive Training
- M- Methodology
- CP- Components
- IF- Intervention Focus
- RD- Reading Disabled
2.6 Insight Gained from the Review of Relevant Literature

The International Dyslexia Association and Maharastra Dyslexia Association emphasised the importance of early identification of students at risk of dyslexia. Reynolds, Wheldall and Madelaine (2011), Wanzek and Vaughn (2007), Karande (2007), and Fawcett, Singleton and Peer (1998) expressed their views through their studies that early interventions to students at risk of dyslexia alleviates their reading difficulties. The studies by Jeyasekaran (2015), Nisha and Kumar (2013), and Zeenat and Dandegoankar (2014) provided reading interventions to students with dyslexia to develop their reading performance. The above mentioned studies used the tool to identify dyslexics but none of these studies developed a screening tool to identify students who are at risk of dyslexia at the primary level. This research gap was identified by the researcher.

It is significant for the present study to note the observation of Watts & Paul Gardner (2013), Torgesen, et al., (2008), Satish et.al., (2010), Wise, et al (1999), Joshi et al. (2002) and Vellutino (2006) on the use of multisensory approach and phonics method to enhance reading performance of struggling readers. Hence the above mentioned concept review helped the investigator on the use of phonics method and multisensory approach for the development of strategic orientation to enhance reading performance in English of students at risk of dyslexia. These insights indeed threw some light to gain momentum to integrate multisensory approach into phonics method for reading development of these students.

The studies conducted in India focused on finding the level of awareness and knowledge about specific learning disabilities among teachers and parents. The studies by Shukla and Agrawal (2015), Shetty and Rai (2014), Saravanabhavan and Saravanabhavan (2010) found that there was average level of awareness and knowledge about specific learning disabilities. Indeed, studies were conducted to develop the reading performance of students with dyslexia. Jeyasekaran (2015), Nisha and Kumar (2013), Zeenat and Dandegoankar (2014), Basu and Beniwal (2014), Patlolla, Venkatesh and Ravindra (2012), Sharma (2010) and Krishnan (2012) focused on developing reading performance of students with dyslexia through differentiated reading interventions. The findings of these studies indicated that reading performance
of students with dyslexia improved after the treatment. None of the above mentioned studies attempted to develop strategic orientation to improve the reading performance in English of students at risk of dyslexia for whom English is a second language.

**Figure 2.F.1: Diagrammatic Representation of Research Gap**

Figure 2.F.1 shows the diagrammatic representation of research gap identified by the investigator of the present study. Although the studies reviewed are pertinent to the present investigation, none of the above mentioned studies have attempted to integrate instructional design for the development of reading intervention to enhance reading performance of students with dyslexia and at risk dyslexia. To fill these research gaps the present study has been stated as “Enhancing Reading Performance of Students At Risk of Dyslexia in English through Strategic Orientation supplemented with Technology”.

The next chapter deals with the development of research instruments.

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