REVIEW OF LITERATURE

The keys to the vast store house of published literature may pen doors to sources of significant problems and explanatory hypothesis and provide helpful orientation for definition of the problem, background for the selection of the procedure and comparative data for interpretation of results.

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The researcher has reviewed more than hundred articles through research journals, both international and national, magazines, newspaper, e papers and websites of various organisations. A glimpse of the review is given in the subsequent passages. The researcher has also compartmentalised the literature review into three sections.

A) Information, Facts and data about learning disability and dyslexia in particular.
B) Diagnostic tests that can be employed to test the presence of Dyslexia.
C) Possible remediation measures used by other researchers across the world.

Each of the section is further subdivided into international research and research within India. In this chapter the researcher will highlight only the research’s done for literature review, however an exhaustive reference will be given in the thesis.

A) Information, Facts and data about learning disability and dyslexia in particular.

National researches viewed are:

- Adarsh Kohli, et al.,( 2018) conducted an research on Specific Learning Disabilities : Issues that remain unanswered which was published in bimonthly journal - Indian Journal of Psychological Medicine, Vol. 40, No. 5 with ISSN no: 0253-7176. The article was to study issues pertinent to problems faced by children with specific learning disability in different part of India which includes states like Haridwar and Puducherry and the awareness amongst teachers in CBSE schools in these places.

  Relevance to the topic: The researcher also believes that there is a dearth of remediators and a possible solution could be to empower teacher in the class.

- Shipra Singh et al.,( May 2017) conducted a study on The study on Specific Learning disability: a 5 year study from India which was published in the quarterly journal-
The article highlights the different types of specific learning disabilities and their occurrence. Among all the types of learning disabilities, Dyslexia, Dysgraphia, and Dyscalculia are most common. It was also found by the authors that ADHD, Anxiety, and deprivations are comorbidity with the disability. Relevance to the topic: The researcher also believes that learning disability is one of the major concerns of school drop-out rate and with the remediation tool, the researcher could enable the teacher in the class to help these students and reduce the school drop-out rate.

- J D Singh., (Jan 2016) in his article on Inclusive education in India - Concept, Need and Challenges. The study was to identify the proportion of school-going children suffering from disability and the possibility of inclusive education for them. Alarmingly, statistics reveal that 2.1% of the population of India has some or the other disability. 75% of these live in rural areas where there is no help.

Relevance: The researcher also aims at creating an inclusive environment where the remediation can be done with the child studying with other peers who do not have learning disability.

- Aruna, et. al. (2016) conducted a study on Inclusive Education in India. The study was on census reports of national and international league and ascertain the possibility of inclusive education for the disabled, which indicate that 90% of the disabled studied in mainstream schools that lacked basic infrastructure which prompted a high drop-out rate. Relevance to my study: the researchers interest to study dyslexia to help situation for the learning disabled has strengthened on learning the most of the identified students grapple with dyslexia.

- Puneet Sandhu., (2015) conducted a study on legislation and the current provisions for Specific Learning Disability in India. Similar observations were also made by

Kamala R.,(May 2014) when she wrote an article Specific Learning Disabilities in India: Rights, Issues and challenges

Objective of both the papers were to research about the legal provisions given to students with specific learning disability and to study the person with disability act 2009 and modifications in 2016 in detail with respect to its relevance to learning disability.
The authors have emphasised the need to strengthen the legal system and make the provisions more robust and accessible for the students. The authors have pointed out that lack of standardised tests does not help the situation.

**Relevance:** The research paper helped the researcher gain insights to the issues faced by the schools and parents to identify and get certification. It also pointed out that there is need to develop tools which can be more objective in assessing the condition.

- **Sunil Karande., (April 2005)** conducted a study on **Current challenges in managing specific learning disability in Indian children.** *Article was for* identifying the challenges faced by the students identified with Specific learning disability. *Author has stated that* there is a need to have economical testing and diagnostic measures which can reach the rural part of India as well and a need to incorporate awareness and training to teach students with SPLD among students of Education, BEd and MEd. **Relevance:** Researcher also aims at identifying the hidden cases of Dyslexia in Indian schools and work on a tool which could be used by the teacher in the class to help the student grappling with disability.

- **Nidhi Singhal., (2005),** has written an article on **Mapping the field of inclusive Education: a review of Indian literature.** The article talks in details about the need to create an inclusive environment initiated by the international awakening towards needs of the disabled. **Relevance of article:** It helped the researcher to realise the limitations of various actions taken by different agencies. Through the drawbacks highlighted the researcher could identify the gap between the ideal and the practical scenario for the learning disabled.

**Some international references are reviewed:**

- **Monicca Leseyane et al (2018)** worked on a study -Dyslexic learners’ experiences with their peers and teachers in special and mainstream primary schools in North-West Province. The study revealed that in public schools the dyslexic learners were exposed to ill-treatment by other learners who despised, ridiculed, bullied and undermined them. The findings further revealed that teachers in public schools were not patient with dyslexic learners, did not give them extra attention and that some teachers used negative comments that embarrassed them. **Relevance of the article:** The study further recommended awareness campaigns among the student body about dyslexia which the researcher intends to conduct.

- **Dale Jordan (2017)** wrote a book on **Dyslexia in the classroom- What every teacher should know.** This book gives a wonderful insight about dyslexia, its causes, ways to identify the
condition. It deals with the significance of teachers being sensitised to the issue and their contribution in helping such students. The book also discusses some remediation measures.

Relevance to the study
This helped the researcher to develop the tool that would be used in the study.

- **Adubasim and Nganji (2017)** conducted a research on *Dyslexia-A Learning Difference*. A review of different brain studies indicated difference between the brains of learners with dyslexia and typical learners without dyslexia. The gray and white matters in the left parieto temporal area of people with dyslexia, which make up the brain and are very important for information processing and transfer around the brain are less. This may account for problems with processing sound structure of language. **Relevance of the article**: The researcher wished to create a tool that can be cost effective as well as helpful.

- **Janette K. Klingner & Sharon Vaughn (2016)** studied *Students' Perceptions of Instruction in Inclusion Classrooms: Implications for Students with Learning Disabilities* published in *Exceptional Children*, Vol. 66, No.1, pp. 23-37. The article states that students with high-incidence disabilities want the same activities, books, homework, grading criteria, and grouping practices as their classmates. Students with and without disabilities value teachers who slow down instruction when needed, explain concepts and assignments clearly, teach learning strategies, and teach the same material in different ways so that everyone can learn. **Relevance of the article**: The researcher also believes that a teacher in the class can help the dyslexic child more than anyone.

- **Jo Worthy et al (2016)** conducted a study on *Teachers’ Understandings, Perspectives, and Experiences of Dyslexia*. The article helped the researcher understand the attitudes and perceptions the teachers may have towards these dyslexic students. They considered it their responsibility to provide appropriate instruction for all their those identified as dyslexic and pointed to a lack of information and clarity about the district’s policies and procedures as one of many barriers to supporting their students identified as dyslexic.

- **Katarzyna M.et.al, (2016)** conducted a research *In search of effective remediation for students with developmental dyslexia – a review of contemporary English literature* published in *Polish Psychological Bulletin*. The paper suggests that effective therapy intervention for dyslexic students should focus not only on the training the affected skills, but also the amelioration of cognitive deficits. It was found that early intervention had
better results than later and remediation at home or place where the subject is at ease helped remediation results. **Relevance of the article** The most effective form of reading therapy is phonologically based and which typically engender training in phonological awareness, letter knowledge, explicit and systematic instruction in phonics, and the application of these skills to actual reading and writing which the researcher wishes to use in her tool for her thesis.

- **Rebecca Elias (2014)** conducted a research on **Dyslexic learners: An investigation into the Attitudes and knowledge of secondary school teachers in New Zealand.** On the whole the findings provide strong evidence of positive attitudes of the vast majority of participating teachers. However the reality is that the average education teacher is unprepared to handle the increasing demands of students with learning difficulties in mainstream educational settings; they are unequipped to handle the academic and emotional characteristics of dyslexia within a regular education classroom. **Relevance of article:** The researcher attempted the literature review to analyse the attitudes of teachers around the world about dyslexia. The research shows that the teachers are aware of the conditions and that it can be helped but there is lack of training in teachers to tackle such situations. Also lack of extra time to train these students was a factor limiting the efforts.


The paper **talks about** application of UID i.e and Universal instructional Design UDLi.e Universal Design of learning in class room situation. Both the models are aimed at creating an inclusive education and the paper cites the theoretical benefits. However the paper laments at the lack of empirical data and the conclusions are based on the literature available for a period of 10years. **Relevance of the article:** The researcher believed that some aspects of this design may help her in designing the tools that she plans to implement.

- **Lynette Sharon Thompson., (2013)** **Dyslexia: An Investigation of Teacher Awareness in Mainstream High Schools** published as a thesis for master in Arts in Psychology, at the University of South Africa. The research is an **eye opener** which proves that most of the teachers could identify the condition however pre service training helped in some cases.
Relevance to the study: This study is motivating for the researcher as she wishes to work in schools where the teachers may not have been trained to identify the condition in the past.

- Gerd Schulte-Körne (2010) conducted a study on *The Prevention, Diagnosis, and Treatment of Dyslexia*. The paper suggests that diagnosis of dyslexia should be established with the aid of the multiaxial classification system. The benefit of specific treatment strategies for dyslexia has been useful in many cases but not yet been demonstrated empirically. However some programs are made available by the author in kindergarten that have been found to promote children’s ability to acquire reading and spelling skills in school. Relevance of the article: This promotes the researchers idea that if interventions are done early there is some hope of improvement in dyslexic students.

- Katharine Giffard-Lindsay (2007) studied *Inclusive Education in India: Interpretation, Implementation, and issues* which was published by: Consortium for Research on Educational Access, Transitions and Equity, Research Monograph No 15, ISBN no: 0-901881-17-1. The book emphasises that a twin-track approach to disability may assist not only in improving educational access for marginalised children, but also the reconceptualization of inclusive education as a school quality issues to benefit all children. It included the training of teacher to cater to the needs of students. Relevance of the article: researcher also believe in this philosophy and this paper has influenced my thoughts towards working for the economically marginalised dyslexics along with others.

- Cecily Ornelles (2006) studied *Inclusion of Students with Mild Disabilities*. The climate was made more conducive and the teachers took extra efforts in working on these students to include them with other students. Instructional strategies used by the classroom teacher supported students’ academic growth. The classroom teacher emphasized the learning process and explicitly taught the connections between academic activities. Relevance of the article: The experiment worked well which gives the researcher motivation to do a similar attempt.

- H Sigmundsson (2005) conducted a research on *Do visual processing deficits cause problem on response time task for dyslexic*, It was found the there was a significant difference and the response time as well as reaction time was more. Relevance of the article: This implies that repetition and extra efforts in teaching a concept could help the dyslexic students.
Albert J. Shannon (1986) conducted a study to learn about dyslexia to write the article- **DYSLEXIA: CAUSES, SYMPTOMS, DEFINITION** published in the annual journal- **Reading, Writing, and Learning Disabilities**. The paper discusses in detail the causes of dyslexia. It also deals with the common and some rare symptoms of dyslexia. It talks in detail about how various researchers have looked at it from different perspective and defined it. Though a very old publication but it is useful in understanding the condition well. The researcher after reviewing the literature on the causes of dyslexia, teachers attitudes and peer attitudes and the challenges faced realised that diagnosis was one very pertinent issue with dyslexia hence she conducted a review of possible diagnostic measures.

B) **Diagnostic tests that can be employed to test the presence of Dyslexia.**

In spite of research for literature, she did not find any diagnostic tests developed in India hence all her literature review is based on international sources.

Turid Helland et.al,(2017) studied **Detecting Preschool Language Impairment and Risk of Developmental Dyslexia** published in the annual journal **Journal of Research in Childhood Education**. The present study discusses three tests Li,CCC2 and TRAS. It shows that these tests do give reasonably similar findings though objectively they may differ. The authors state that none of the tests were significant individually but if all were administered it was possible to detect. Also these tests were administered to the care givers, hence reliable.

ElisaPedroli et al (2017) worked for **A Psychometric Tool for a Virtual Reality Rehabilitation Approach for Dyslexia**. This technology is able to involve children in nonconventional tasks and allow them to work in a virtual environment similar to there alone. It is a wonderful experiment but falls short of validity as the sample size on which the experiment was done is too small for the tool to have statistical validity.

Hulme, Charles Snowling, Margaret, J (2016) studied **Reading disorders and dyslexia**. Dyslexia is primarily a decoding difficulty, many children also experience reading comprehension problems associated with co-occurring language difficulties. They believe that screening for language difficulties should be conducted at school entry to identify children who are at risk of difficulties in learning to read. Relevance of the article: This necessitates the need to screen students for dyslexia early in life.

The idea of a single series of mini-game that would be able to screen dyslexia through mobile approach is suggested to cope with the problem of non-standardized screening method for untrained teacher to recognized the symptom of dyslexia, and to cope with ill awareness of the dyslexia problem. Relevance of the topic: The proposed mobile game is at its initial phase and further development may prove to create a useful diagnostic tool.

The Dyslexia Toolkit An Essential Resource Provided by the National Center for Learning Disabilities (2012)

The booklet is about understanding dyslexia in detail. It has some valuable information on symptoms to identify in dyslexics based on their age group. Relevance of the book: It has helped the researcher in devising diagnostic questionnaire for parents, teachers and peers. It gives a comprehensive outlook towards dyslexia. It has some suggestions on remediation too which have helped the researcher.

Erik G, Willcutt, et.al, (2011) created Colorado Learning Difficulties Questionnaire: Validation of a Parent-Report Screening Measure. Results suggest that this scale may provide a useful screening measure for reading difficulties in both research and clinical settings and are also promising for scales that assess math, social anxiety, social cognition, and spatial difficulties, but additional research is needed to address specific weaknesses identified in each of these scales. Relevance of the article: This questionnaire has proved itself on the test of validity and reliability and hence the researcher found it useful.


The article is a proposal to devise a diagnostic criteria and an attempt to free LD diagnosis from many of the conceptual misunderstandings and untenable measurement assumptions of the past. The researcher has attempted to a detail literature study on diagnostic tools and found some good tools which lack validity while some standardised test. In due course of research the researcher may attempt using these tools for diagnosis.

C) Possible remediation measures used by other researchers across the world.

National researches reviewed are:
Sunil Karande, et al (2017) studied Managing Specific Learning Disability in Schools in India. The paper states that schools must ensure that the regular classroom teachers undergo training in SpLD and even encourage some of them take up the additional responsibility of becoming remedial teachers. Thus the article gives the researcher an idea into the problem that could be addressed through the research.

International researches:

Marianne Nilsen Kvande et al. (2018) studied Effects of special education on academic achievement and task motivation: a propensity score and fixed-effects approach. A clear strength of the current study is the rigorous methodology employed, controlling for both the propensity score and unobserved time-invariant confounders. Additional strengths include the large sample size of students and the duration. It is important to highlight that although we failed to detect any positive effects of SE services when the two-pronged effort to discount selection effects was implemented, it remains possible that significant benefits occurred for some children and positive effects for some specific forms of service do exist that are masked by the heterogeneity in SE’s student population.

Thomas Nordstrøm et al. (2018) worked on Assistive technology applications for students with reading difficulties: special education teacher’s experiences and perception of teachers’ experiences. Findings show that students with reading difficulties seem to be able to use AT in order to assimilate text (i.e., to read) and to communicate text (i.e., to write), and, thus, AT has the potential to promote participation in regular education.

Poobrasert Onintra. (2017) created Educational Assistive Technology for Students with Communication Disorders. This paper is aimed to create an assistive technology tool to help students with learning disabilities in Thailand to learn to write. This article is about use of Thai word search and Thai word predictor. Similar tools however are not available in India.


This a very unique and innovative study where the authors have used positional parameter while reading and objective is to observe its impact on reading ability. Dyslexia was visually corrected by use of a new reading method and Positional Reading Arc positions. This article
explains that the position of the gaze may also be important for treatment of dyslexia. Relevance of the article: Researcher will need to keep this in mind while working on her tools.

- Fiona J. Duff et al (2014) conducted a study on Reading and language intervention for children at risk of dyslexia: a randomised controlled trial

The interventions were fragile and short lived, and there was no reliable effect on the primary outcome of word-level reading. Although disappointing, the authors believe reporting a null result is important with respect to raising standards in reporting of trials and in educational practice. Relevance of the article: This article makes the researcher aware that she is dealing with students who are not homogenous subjects and outcomes may not always be as expected.

- Onintra Poobrasert & Waragorn Gestubtim (2014) conducted a study on Development of Assistive Technology When Learning Disability is no Barrier. This paper is aimed to create an assistive technology tool to help students with learning disabilities in Thailand to learn to write. Thai Spell Checker which could help Thai spelling and search Thai words well and fast. The students mentioned that the program assisted them to be able to choose vocabulary and print the work correctly. In addition, the program also helps the students to know how each word is spelled as it provides pronunciation for each word. However this is technology dependant and needs skill for program development.

- Siti Huzaimah Sahari & Aiza Johari., (2012) studied Improvising Reading Classes and Classroom Environment for Children with Reading Difficulties and Dyslexia Symptoms. The paper has some suggestions on how to improvise reading class’s environment to cater to the dyslexics and children with reading difficulties. They explained the need to encourage reading as well as practical tips for teachers like seating near the teacher, repeat. These are probable suggestions but author does not have conclusive data about the impact of these tools of remediation.

- Maureen W. Lovett (1991) Reading, writing, and remediation: Perspectives on the dyslexic learning disability. The article suggests that dyslexic readers are successful at the early stages of learning to read and can acquire reading vocabulary on the basis of whole word learning. Their deficient phonological awareness, however, appears to prevent them from extracting larger sub word units, and they therefore have no experience or basis for proceeding to smaller-unit extraction of letters and the acquisition of GPC patterns.
Relevance of the article: This research though an old one will help the researcher in her studies which aims at reading out the text to the students.