International Journal for Modern Trends in Science and Technology, 9(05): 16-24, 2023 Copyright © 2023International Journal for Modern Trends in Science and Technology ISSN: 2455-3778 online DOI: https://doi.org/10.46501/IJMTST0905003

Available online at: http://www.ijmtst.com/vol9issue05.html



# Various intervention techniques for learning difficulty ournal For in adolescent girls

# Dr. Anwesha Chakrabarti

Assistant Professor, Department of Psychology, Sarojini Naidu College for Women

#### **To Cite this Article**

Dr. Anwesha Chakrabarti. Various intervention techniques for learning difficulty in adolescent girls. International Journal for Modern Trends in Science and Technology 2023, 9(05), pp. 16-24. https://doi.org/10.46501/IJMTST0905003

#### **Article Info**

Received: 28 March 2023; Accepted: 28 April 2023; Published: 30 April 2023.

# ABSTRACT

The present study inv<mark>estig</mark>ates the effect of alternative interv</mark>ention te<mark>chniq</mark>ues in three groups of adolescen</mark>ts (age range 12-16 years; gender -female) having difficulty in reading and writing. The primary objective of this study is to test the efficacy of training in pattern recognition (developed by Chakrabarti and Banerjee, 2018). A total of 19 participants were taken from different psychological clinics and the intervention techniques varied in three different ways for the three experimental groups. The first group (n=6) was given a training on pattern recognition in a software. The second group (n=6) was given remedial reaching technique. The third group (n=7) was given an integrated version of all these techniques. A total of 10 sessions of intervention was given to each of the group individually. The pre-post comparison was measured on the basis of Diagnostic Test for Learning Disabilities as well as parental rating regarding learning behaviour of the girls. The result was analysed quantitatively from both the perspectives (learners and there parents) which suggests that the 3rd group which has received both the training of pattern recognition and remedi-al teaching have scored highest in post test condition and it had increased their interest, motivation, confidence, attention as well as managing doubts and confusions.

Key word- learning difficulty, pattern recognition training, remedial teaching

### **1. INTRODUCTION**

The terms ' learning disability', 'learning difficulty', 'learning disorder' are used almost interchangeably to denote a condition of difficulty in coping with academic curriculum having no intellectual deficit or physical disability. A recent article by Roopesh (2021) has clearly explained the difference among the terms saying the 'difficulty' might be a temporary , and having relatively less severe condition whereas disability signifies greater severity of learning problem. However, DSM V considers the term 'disorder' incorporating all levels of learning problem, covering all the three severity levels. Whatever the theoretical division is, in practical situation a number of school going children face problem during

regarding school curriculum at some point of time. If proper intervention is applied then they recover quickly. Otherwise the the academic lag increases resulting in learning disability in higher class. Thus following 'Responsiveness to Intervention' model it is very important to achieve early identification of students with SLD to ensure effective support timely. (Gresham, 2002; Learning Disabilities Roundtable, 2002, 2005; National Research Council, 2002; President's Commission on Excellence in Special Education, 2002).

Although difficulty in learning has its own neuropsychological correlates but during adolescents there are many plausible sources for them to worsen the academic record. A lots of adjustment issue, peer acceptance, self-concept, hunching for identity are common in adolescence, especially in girls. If proper guidance, counselling or supporting environment is not available then the individuals having learning issue might not cope efficiently in their academic world. Thus choice of intervention is the foremost important factor at this stage. Whatever issues adolescents girls have in their psychological world, it has reflection in their academics. Thus solution of whatever issues are very much necessary to bring about good academic record. It will help in building positive self concept, confidence and greater motivation towards achievement.

Several studies have determined that SLD is caused by phonological, orthographic, or both impairments. Orthographical processing is the process of identifying and recollecting the letters that make up a word, such as their order. The development of these skills has since been the subject of intervention strategies. The majority of these intervention strategies focused on phonological ability to improve phonemic awareness and decoding abilities (Blachman, 1997, Lyon and Moats 1997). Yet, comparatively fewer studies have focused on developing orthographic skills, despite the fact that many scholars have recognised the importance of doing so. Poor readers have trouble recognising words and dismissing other extraneous information, according to Presley (1998).

In their double deficit hypothesis, Wolf and Bower (1999) stated that dyslexic readers had weak word recognition skills. According to Seidenberg and McClellan (1989), segmenting sublexical patterns for the most common letter patterns and visual-auditory perception of letters are both necessary for automatic letter pattern identification. According to Snowling and his colleagues (1992), dyslexia is connected to the ability to recognise and comprehend printed content. This association is also found in older readers who have trouble reading automatically but not accurately. A comprehensive fluency-based intervention strategy was later established by Wolf and his colleagues (2000), stressing each of the cognitive processes, including retrieval, automaticity, vocabulary, elaboration, and orthography (RAVE-O).

Training in morphological awareness contributes to yet another sizable corpus of research on SLD treatments. According to the triple word form hypothesis, learning to spell, read, and speak include connected processes for developing phonological, orthographic, and morphological awareness (Bahr et al, 2012; Berninger et al, 2010). Word study, or active exploration of a word, entails correspondences between letter patterns, spelling, and a reflection of word meaning, or morphology. A number of scholars have documented the impact of morphological awareness on reading abilities (e.g. Carlisle & Fleming, 2003; McCutchen et al, 2008; Singson et al, 2000). Children of third through sixth graders who struggle with reading and spelling have been shown to benefit from a multilingual intervention in terms of improving their spelling and reading (Apel and Masterson, 2001; Burning et al, 2004).

A few attempts have been made to improve associated cognitive abilities such as working memory, attention, and visuospatial and spatial abilities in addition to these direct methods. According to Holmes et al. (2012), training in WM has used either of the two strategies for specific learning disabilities. Although the second focuses on offering specific working memory training, the first aims to accelerate learning for kids with memory issues by modifying the learning environment.

Classroom teachers are often asked to adapt teaching techniques to reduce the cognitive load of children with poor WM. Computerized training paradigms such as Cogmed, Jungle Memory, Cognifit, and N-Back are available to provide WM training for a continued period of time. However, the long-term effect of these techniques on learning is not known. Studies have shown that cognitive training programs have an accelerating effect on WM skills, as well as generalized to other non-trained domains. Dunning and his colleagues (2012) have shown that a group of children with memory impairment are exhibiting improvement in memory tasks even after 12 months of training without any additional intervention.

However, the extent to which these improvements in WM benefit other skills and abilities is a debated issue. Holmes (2012) noted that more findings are needed to fill up the theoretical gaps regarding the process through which transfer of this training onto different skills occurs.

Against this backdrop the present study aims at comparing the two forms of intervention strategies in female adolescents who are manifesting mind to moderate difficulty in coping with the academic curriculum. The present study took three small groups of participants and varied the intervention techniques in three modes: 1. training of Pattern recognition, mainly targeting to improve attention or WM skill 2. training in remedial teaching, targeting to improve the phonological and orthographical skill and 3. an implementation of both the training module in pattern recognition and remedial teaching.

# 2. METHOD:

# **Participants:**

A total of 19 female adolescents (age range- 12-16 years) diagnosed with specific learning problem were taken and they were further assigned to three experimental groups.

All of the participants spoke Bengali as their mother tongue, and English was their first language in school. The sample was obtained from various clinics in the city of Kolkata. The screening instruments for IQ and specific learning problems were given to all of the subjects. First-generation learners were not included in this study.

Table 1 Shows the range of age, IQ, grade range for all the 3 experimental groups:

	Age range	IQ range	Grade range
Group 1	12-15	98-109	5-8
Group 2	12.5-16	94-108	6-9
Group 3	13- 15.5	100- 112	6-8

#### Tools used for diagnosis and screening:

The present study included screening tools, case history, clinical interview, observation of behavior, Malin's Intelligence scale for Indian Children, NIMHANS Index for Specific Learning Disability. The NIMHANS Index for SLD consists of the Bender Gestalt Test, Minnesota Percepto Diagnostic test, Tests of reading, writing, comprehension, spelling and arithmetic, Attention test (number cancellation), Language test (Reading, writing, spelling and comprehension), arithmetic (Addition, Subtraction, Multiplication, Division and Fractions), Visuo- motor Skills (Bender Gestalt Test and the Developmental Test for Visuo-motor Integration) and Memory (Auditory and Visual). The scores of Dagnostic Test for Learning Disabilities on different domains are used as the before-after measure. It must be mentioned that this test is used only for pre- post comparison and not for diagnostic purposes. The test covers ten domains of psychological process and six areas represent the processes involved in visual and auditory perception.

Based on the presenting complaints given by parents regarding the participant here are some common features. Table 2 shows the complaints reported by the parents in each group.

Table 2: Percentage of presenting problem for each of the 3 groups.

Presenting complaints	Group1 (n= 6)	Percentage	Group2 (n= 6)	Percentage	Group3 (n=7)	Percentage	Total (n=19)
Lacks interest in study	6	100%	6	100%	6	85%	95%
Confusion during reading or writing	5	83%	4	66%	4	57%	68%
Difficulty in reading	6	100%	6	100%	6	85%	95%
Poor hand writing	4	66%	4	66%	5	71%	68%
Exessive screen attachment	5	83%	6	100%	6	85%	89%
Does not sit to study	6	100%	6	100%	5	71%	89%
Has interest in everything other than study	5	83%	5	83%	4	100%	74%
Low confidence	4	66%	4	66%	7	100%	79%

Presenting complaints	Group1 (n= 6)	Percentage	Group2 (n= 6)	Percentage	Group3 (n=7)	Percentage	Total (n=19)
Difficulty in focusing attention	6	100%	6	100%	5	100%	89%
Mood Swing	4	66%	3	50%	4	57%	58%
Argumentativeness	3	50%	2	33%	4	66%	47%

# 4. INTERVENTION MODULES:

### 1. Pattern recognition training-

Software preparation and Standardisation:

This software programming was specifically designed for measuring the cognitive functioning which are basically the pattern perception tasks in different stimulus conditions. The entire software programming has been designed in Direct RT software. Each and every WM task is a kind of pattern recognition task where the subject has to recognize the target pattern and the subject has to discriminate the target pattern from any kind of non-target ones. The subject is instructed to respond to a target by pressing a particular key e.g. '/' and detecting any kind of non-target s/he has to press another specified key e.g. 'Z'.

# **Expert judgement:**

Three experts from the fields of psychiatry, special education, and clinical psychology provided pertinent feedback when the software preparation was complete. On a 5-point scale, they had to score the software program's applicability to a particular learning difficulty. The average score assigned by these three judges was 4.

# Description of pattern recognition training:

The training module consisted of 3 types of Pattern recognition tasks, reading related, writing related and arithmetic skill related. In reading related task there was single letter identification through which subject identifies a single letter in several words, and alphabet rotation for identifying the mirror image of a letter requiring mental rotation. In writing related task subjects were to distinguish a particular letter font and a letter size among other fonts and sizes separately. In case of arithmetic related task the subjects were given to identify a single digit and a double digit number in two different tasks. Thus basically, all the tasks require sustained attention skill, and it was hypothesised that practising this sustained attention task will result in better patter recognition, increased attention span and better working memory. (Chakrabarti & Banerjee, 2017)

# 2. Remedial Teaching Module:

It was targeted to increase the phonological awareness and building up orthographical processing skill.

For phonological awareness The following training was provided.

- 1. phonic training for each alphabet, long and short sound vowels
- 2. making rhyming words
- 3. demonstration and practice of reading aloud
- 4. writing to dictation

The training for orthographical skill includes the following techniques

- 1. Learning Sight words
- 2. Identifying common words in text
- 3. Copying words from books
- 4. Copying text
- **Procedure:**

<u>Pilot study for fixing difficulty level of pattern</u> recognition tasks-

At first a sample of 10 children of 8-16 years of age were taken and they were administered the task of moderate difficulty level. As the target population in the main study are children with specific learning disorder, so difficulty level was selected on the basis of the assumption that there might be chance of children with learning disorder to perceive the same task as more difficult.

After assuring that less than 50% of the children in no academic difficulty group attain the full score and at least 75% of the children attain 75-100% score, the particular task is retained with its existing

#### Main study:

All the participants were taken from different psychological clinics and experts' referral. The screening tools were administered and case history was collected.

Then the total number (n=19) of participants were subdivided into three treatment conditions. Group 1 received the pattern recognition training in software as well as in paper pencil mode through 10 sessions. The parents were also trained to make practice the students at home. Generally 1 or 2 sessions were conducted week. Group 2 received the remedial teaching techniques through 10 sessions, each week with 1 or 2 sessions. The group 3 received both the training modules pattern recognition along with the remedial teaching. Diagnostic Test for Learning Disability (DTLD) was administered twice before and after the administration of training module.

After the training the parents were asked to rate the progress in terms of four behavioural features which were reflected in their verbatim of presenting complaints. We took some of the features which were common in presenting complaints and related to our training targets and collected the rating (out of 10) given by the the parents (mother in almost 90 % cases) for each behavioural component. The chosen behaviours are lacks interest in study, low confidence, confusion during

reading or writing, sits to study and difficulty to focus attention. The parents were asked to provide rating on the basis of retrospective analysis. The ratings of pre and post test condition is compared for each group.

For each segment scoring was done, observation of learning behaviour was made and the parental report was collected for each children.

Result: The result was analysed by non-parametric statistical techniques because of very small sample in each group. Kruskal wallis test was administered to find out the group difference in both pre and post test conditions. Friedman test was performed to see the pre-post comparison for each group. For the DTLD mean scores in pretest the group difference was statistically not significant, confirming the equality of the subgroups. In post test also the group difference is not significant. But in case of pretest - post-test comparison we have seen that the mean difference is significant in case of group 1 and group 3 only. However, there is a slight increase in mean score for all the three conditions.

Table 3: the DTLD scores, mean, SD and mean difference in pre test and post test and pre-post comparison for each

	Pretest DTLD scores	Pretest Mean	Pretest SD	Posttest DTLD scores	Post test mean	Post test SD	p value for Friedman test
		<i>(</i> <b>22</b>	0.50	<i></i>	_	0.51	
GROUP 1	5.50	6.08	0.73	6.00	7	0.71	0.026*
	6.00	-		7.00			
	5.00			6.50		5	•
	7.00	-		7.50	C		
	6.50	C. Hay		8.00	35		
	6.50	• pu	0 03	7.00	0		
GROUP 2	6.50	5.92	0.86	6.50	6.75	0.76	0.066
	6.50			7.00			
	5.00			8.00			
	7.00			7.00			
	5.00			6.00			

	5.50			6.00			
GROUP 3	5.50	5.4	0.61	6.50	6.86	0.63	0.023 *
	6.00			7.00			
	6.00			6.00			
	5.00			7.00			
	6.00			8.00			
	4.50		100	6.50			
	5.00	al C		7.00	7/		
p value for Kruskal Wallis test		0.259			0.772		

# p value >.01\*\*, > .05\*

Table 4: Mean of Parental rating score in each group in pre-and post conditions.

	Group1		Group2		Group 3	
	Pre	post	Pre	post	Pre	post
Lacks interest in study	100	65	100	65	100	52
Confusion during reading and writing	100	63	100	65	100	60
Does not sits to study	100	76	100	65	95	62
Difficulty in attention	90	73	100	73	100	62
Low confidence	100	65	100	76	100	60
Pre-post comparison p value	0.042*		0.039*		0.043*	5

# p > 0.01\*\*, p > 0.05\*

Table 5: Comparison among the groups in pre and post conditions for parental rating along with post hoc comparison for the post intervention situation:

Group Difference	Group Difference	Post Hoc comparison				
Pre test	Post	Gr 1vs Gr 2 Gr 2 vs Gr 3 Gr 3 vs Gr 1				
0.581	0.007**	0.005**	0.008**	0.008**		

 $p > 0.01^{**}, p > 0.05^{*}$ 

#### 5. DISCUSSION :

The present study aims at comparing the different intervention techniques in adolescent girls having learning difficulty. We varied the three intervention levels: pattern recognition training (Working Memory tasking), remedial teaching training (targeted to improve phonological and orthographical skill), and both in three groups. Pre and post test comparison was done on the basis of DTLD scores. The result (Table 3) suggests that there was no significant group difference in both pre and post test conditions. But for Group 1 and group 3 the mean differences in DTLD scores between pre and post testing condition was statistically significant and in both the groups the scores have been increased. Thus result suggests that when the pattern recognition training was provided alone and in association with remedial teaching it has greater impact on learning score, indicating improvement in learning. According to authors like Kline and Lerner (2006), computer and software projects appear to be more engaging and motivating for the kids than work requiring paper and pencil. However, although not statistically significant, still there is an increase in men score in post testing contain for group 2 showing the effectiveness of remedial teaching. Thus, both the approaches are helpful to improve ones learning score. But as reflected in the result pattern recognition training yields greater impact on learning. Dunning et al., (2012) has also seen that working memory training is effective to improve cognitive skills. Due to the fact that dyslexic readers have poorer sensitivity to both visual and auditory cues than typical readers (Stein and Talcott, 1999), training in visual perception can help learning disabled individuals with their sensitivity to pattern recognition. It has also been observed that the children's personality traits improved as a result of acquiring particular academic skills. They assisted in improving the children's self-worth and confidence as well as their social skills. Self-esteem is a result of achievement; it cannot be forced or taught, as Richardson (2003) pointed out. According to Brooks (2000), therapeutic instruction must result in successful learning in a way that has a positive impact.

In addition to the DTLD scores the parental rating regarding the adolescents' behaviour towards engagement in reading and writing were also analysed. It is to understand that learning problem does not come alone in adolescence. It is largely associated with ones self concept, confidence, emotional issues, behavioural issues and other cognitive issues. In this study parental view was also taken into consideration to evaluate the changes in adolescent girls' behaviour. When an adolescent is facing difficulty in coping with her academic curriculum and repeatedly getting negative feedback from school, it impacts the parents also. Thus their perspective was taken and analysed here. Table 2 shows the common complaints of parents regarding their girl children with learning difficulty. the frequency and percentage of each problem in each group and as a whole group was given. It is seen that the most common agreements are in lack of interest in study (95%), does not sit for study (89%), Problem in focusing attention (89%), screen attachment (89%) and low confidence (79%), Has interest in everything other than study (74%), confusion in reading and writing (68%) and poor hand writing (68%). These complaints are most common among parents. Thus, we analysed few of the behaviours which are common as well as pertinent with our intervention objectives. At the end of the intervention program the parents are asked to rate (in a 5 point scale) those five components in their daughters' behaviour at the beginning (before the intervention) and at the end (after the intervention). The mean percentage of each behaviour in each group before and after the intervention is given in Table 4.

Analysis of difference in parental rating in pre and post testing condition is summarised in Table 4. For all the 3 groups pre-post comparison is statistically significant at 0.05 level.

Additionally Table 5 shows that there is no group difference in parental rating in pre testing condition but the group difference is significant at .01 level at post testing condition. The post-hoc analysis confirms that the mean differences between each pair of these three groups were significant at 0.01 level in post intervention phase. Thus it can be certainly stated that the parental rating regarding the problem within their daughters has certainly changed after the training sessions. But the way they reacted differed differently for different groups. It is notable that in case of group1 the improvement reflected by lower problem rating by parents in lacking interest in study, confusion during reading and writing, and in low confidence area. Thus, the pattern recognition training, which was designed to improve working memory functioning, has been successful to improve interest,

confidence and to lowering of confusion. In case of group 2 the interest, motivation, and confusion were the areas that got improvement. Thus remedial teaching, which was signed to improve phonological and orthographical skills, is effective to improve these components in learners. surprisingly, in case of group three group 3 the problem rating is lowest for all five areas. Thus if pattern recognition training is clubbed with remedial teaching it helps in bring about positive behavioural changes within the learners and is effectively work on attention, motivation, interest, confidence and managing confusions or doubts. Individuals receive intervention to improve three different area phonological awareness, orthographical skills as well as working memory. As pointed out by Richardson (2003), Self-esteem is a result of achievement; it cannot be forced or taught. According to Brooks (2000), effective therapeutic instruction must result in learning achievement that improves self-worth, rekindles a desire to study, and has a positive impact on personality. Effective teaching was thought to need a subjective awareness of the students' feelings, emotions, and attitudes (Brooks and Goldstein, 2002). Mutual respect is of the utmost importance when it comes to the interpersonal relationship component or rapport between instructor and student, according to Kline and Learner (2006).

# 6. CONCLUSION:

From the above study we can conclude that learning problem in adolescent girls needs effective intervention. Here training procedures were varied in three different modes: pattern recognition training, remedial teaching and both. It is seen that the differences in learning from pre to post testing condition was facilitated significantly for group 1 and group 3 but not in case of group 2, reflecting that remedial teaching alone was not that effective in comparison to pattern recognition training and combination of two techniques of teaching.

In addition to the learning scores, parental rating regarding their daughter's learning behaviour was also collected comparing both in pre and post conditions. Both intervention through remedial teaching and pattern recognition brought about some changes toward learning behaviour but when the two modes of intervention were implemented on same group, it was most effective to change the positive learning behaviours.

The finding implies that intervention is inevitable to improve the learning behaviour of adolescent girls who are facing difficulty in learning the academic curriculum. If intervention is given in proper time and pace individual's overall learning behaviour ill be benefitted, and they might dream for better future.

# **Conflict of interest statement**

Authors declare that they do not have any conflict of interest.

#### REFERENCES

- Apel, K., & Masterson, J. (2001). Theory guided spelling assessment and intervention: A case study. Language, Speech, and Hearing Services in the Schools, 32(3), 182–195.
- [2] Bahr, R. H., Silliman, E. R., Berninger, V. W., & Dow, M. (2012). Linguistic pattern analysis of misspellings of typically developing writers in grades 1-9. Journal of Speech, Language, and Hearing Research, 55, 1587-1599.
- [3] Berninger, V. W., & Abbott, R. (2003). PAL research-supported reading and writing lessons. San Antonio, TX: Harcourt.
- [4] Berninger, V. W., Abbott, R. D., Nagy, W., & Carlisle, J.
  (2010). Growth in phonological, orthographic, and morphological awareness in grades 1 to 6. Journal of Psycholinguistic Research, 39, 141–163.
- [5] Carlisle, J. F., & Fleming, J. (2003). Lexical processing of morphologically complex words in the elementary years. Scientific Studies of Reading, 7, 239–253. doi:10.1207/ S1532799XSSR0703\_3.
- [6] Chakrabarti, A., & Banerjee, M. (2017). Intervention based on training in pattern recognition in learning disability: a case study appoach. International Journal of Current Research. Vol. 9, Issue, 06, pp.52702-52709.
- [7] Dunning, D. L., Holmes, J., & Gathercole, S.E. (2012). Does working memory training improve the classroom performance of children with poor working memory? A randomized control trial. In Working memory and Learning difficulties (2012) by Holmes J., Dyslexia review Summer.
- [8] DSM-5. 2010. A 13 dyslexia. APA DSM-5 development. Available from: http://www.dsm5.org/ProposedRevisions/Pages/proposed revision.aspx?rid=84[last accessed 11 November 2011]
- [9] Gresham, F. M. (2002). Responsiveness to intervention: An alternative approach to the identification of learning disabilities. In R. Bradley, L. Danielson, & D. P. Hallahan

(Eds.), Identification of learning disabilities: Research to practice (pp. 467–519). Mahwah, NJ: Erlbaum.

- [10] Holmes, J. & Gathercole, S.E. (2012). Taking working memory training from the laboratory into schools. In Working memory and Learning difficulties (2012) by Holmes J., Dyslexia review Summer.
- [11] Kapur, M., John, A., Rozario, J., Oommen, A. (1991). Nimhans Index of Specific Learning Disabilities manual, Department of Clinical Psychology, NIMHANS.
- [12] Learning Disabilities Roundtable. (2002). Specific learning disabilities: Finding common ground. Washington, DC: American Institutes for Research. Retrieved from http://www.ncld.org/advocacy/Common Ground.doc
- [13] Learning Disabilities Roundtable. (2005, February). Comments and recommendations on regulatory issues under the Individuals with Disabilities Education Improvement Act of 2004, Public Law 108-446. Retrieved from

http://www.nasponline.org/advocacy/2004LDRoundtable RecsTransmittal.pdf

- [14] Lerner J.W. & Kline F. 2006. Learning disabilities and related disorders: Characteristics and Teaching Strategies. Tenth edition. Houghton Miffin Co. New York.
- [15] Lyon, G. (1995). Toward a definition of dyslexia. Annals of Dyslexia, 45, 3–27.
- [16] Lyon, G. R., Fletcher, J. M., Shaywitz, S. E., Shaywitz, B. A., Torgesen, J. K., Wood, F., et al. (2001). Rethinking learning disabilities. In C. E. Finn Jr., A. J. Rotherham, & C. R. Hokanson Jr. (Eds.), Rethinking special education for a new century (pp. 259–287). Washington, DC: Thomas B. Fordham Foundation. Retrieved from http://www.excellence.net/library/special ed/index.html
- [17] Malin, A.J. (1969). Malin's Intelligence Scale for Indian Children (MISIC). Indian Psychological Corporation, Lucknow.
- [18] McCutchen, D., Green, L., & Abbott, R. D. (2008). Children's morphological knowledge: Links to literacy. Reading Psychology, 29, 289–314.
- [19] Richardson, S. 2003. Are we enablers or disablers? Perspectives. International Dyslexia Association, 29 (3), 13-14.
- [20] Roopesh B. N. (2021). Specific Learning Difficulty Assessment and Interpretation: NIMHANS SLD Battery and Beyond. Indian Journal of Mental Health.
- [21] Seidenberg, M.S., & McClelland, J.L. (1989). A distributed, developmental model of word recognition and naming. Psychological Review. 96(4):523–568.
- [22] Singson, M., Mahoney, D., & Mann, V. (2000). The relation between reading ability and morphological skills: Evidence from derivational suffixes. Reading and Writing: An Interdisciplinary Journal, 12, 219–252. doi:10.1023/A:1008196330239

- [23] Wolf, M. and Bowers P.G. (1999). The double-deficit hypothesis for developmental dyslexia', Journal of Educational Psychology, 91, 415-438.
- [24] Snowling, M.J. (1992). Dyslexia- A cognitive developmental perspective. Oxford: Blackwell.

nal For

