TESTING THE EFFICACY OF PATTERN RECOGNITION TRAINING TECHNIQUE IN COMPARISON TO REMEDIAL TEACHING IN LEARNING DIFFICULTY

Abstract

The present study wants to investigate some intervention techniques in three groups of adolescent girls (age range 12-14 years) having learning difficulty. The aim was to test the efficacy of pattern recognition training (Chakrabarti and Banerjee, 2018). A total of 21 participants were taken from different psychological clinics. They were grouped into three groups based on different intervention planning. The first group (n= 7) was control group without any intervention. The second group (n=7) was given a training on pattern recognition in a software. The third group (n=7) was given remedial teaching technique. The last two groups received intervention for 1 month (8 sessions). The pre - post comparison was measured based on Diagnostic Test for Learning Disabilities. The result was analyzed by nonparametric statistical techniques which suggests that both the intervention techniques are almost equally effective than the control group. But the parental report suggests use of pattern recognition training is helpful to increase interest and confidence among the students of learning difficulty.

Keyword: learning difficulty, pattern recognition training, remedial teaching

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I. INTRODUCTION

Learning disorder or learning difficulty is a condition where individuals are suffering from the difficulty in one or more academic skills despite having no deficit in intellectual capacity. The terms 'dyslexia', 'dysgraphia' and 'dyscalculia' are used to denote the difficulty in reading, writing and mathematical skills respectively. But it is not so easy to classify the groups only in terms of a single deficit. In most of the cases of learning difficulty reading, writing, mathematical skills are impaired hand in hand.

Among the existing intervention techniques phonic training, special education and morphological training (Bahr et al, 2012; Berninger et al, 2010) are frequently used. All these techniques are basically breaking down the learning process into smaller cognitive units then sensitizing each step. Some interventions are focusing on auditory units of the associated letter sounds; some are designed for visual units of the written materials. The approach differs from one technique to another. To enhance phonemic awareness and decoding skills, the bulk of intervention treatments concentrated on phonological ability (Blachman, 1997; Lyon et al., 2001). Although many academicians have acknowledged the value of doing so, relatively few researchers have concentrated on orthographic skills. According to Pressley (1998), ineffective readers have problems detecting words and filtering out irrelevant information. A large practice of special educational techniques is successfully going on. Wolf and his colleagues (2000) developed a thorough fluency-based intervention technique that emphasized each of the cognitive processes, including retrieval, automaticity, vocabulary, elaboration, and orthography (RAVE-O).

Few literatures are also supporting the fact that there is a possible explanation of working memory deficit in learning disability. Holmes et al. (2012) claims that training in Working Memory (WM) has utilized either of the two approaches for certain learning impairments. The first seeks to fasten learning for children with memory impairments by altering the learning environment, whereas the second focuses on providing specific working memory training. Classroom teachers are frequently asked to modify their methods of instruction to lighten the cognitive load of kids with weak WM. There are computerized training paradigms like Cogmed, Jungle Memory, Cognifit, and N-Back that can be used to train WM over time. However, it is unknown how these strategies will affect learning over the long term. According to studies, cognitive training programmes can accelerate the development of working memory skills as well as generalize their effects to other non-trained areas.

Visual processing of written units is also shown to be impaired in certain cases. Chakrabarti & Banerjee (2018) noted that pattern recognition training is beneficial for the individuals to improve their learning scores. Here it is assumed to the fact that when the reader is confused with a visual pattern with similar other patterns then the therapeutic goal should include the agenda of sensitizing the readers regarding various visual patterns. If they can be able to differentiate various patterns, then their confusion regarding the written units will be reduced. However, there is scarcity of research in efficacy study of pattern recognition training in the field of learning difficulty.

Thus, the present study aims at testing the efficacy of pattern recognition training in comparison to special educational training and a control group with no such structured intervention.

II. METHOD

1. **Participants:** 21 girls (12–14 years old) who had been diagnosed with a specific learning issue were taken, and three experimental groups were then assigned to them. Bengali was the native language of each participant, while English was their first language at school. The sample was collected from several clinics in Kolkata. All the subjects received the IQ and specialized learning issue screening tools. First-generation students weren't considered in this study. The IQ range was 89 to 105 of all the participants. All of them were having at least two grade deficits in terms of academic skills.

2. **Tools:** Screening: Screening of the participants were done by NIMHANS INDEX for specific learning disability and Malins Intelligence Scale for Indian Children (Malin, 1969).

III. INTERVENTIONS TECHNIQUES

1. **Pattern Recognition:** This software was created primarily for testing cognitive abilities, which essentially involve tasks involving pattern detection under various stimuli settings. Direct RT software was used to design the complete software code. Every single WM task is a type of pattern recognition task in which the subject must identify the target pattern and distinguish it from any other non-target patterns. After the software was ready, three professionals from the domains of psychiatry, special education, and clinical psychology offered helpful suggestions. They were to rate the software's suitability for a specific learning challenge on a scale of 1 to 5. The average rating of the three experts was 4.

2. **Pattern Recognition Training:** The training module included two different kinds of pattern identification tasks for reading and writing. Alphabet identification, which requires the respondent to recognize a single letter in several words, and alphabet rotation, which asks them to recognize the mirror image of a letter, was two reading-related tasks. Subjects were required to identify a certain letter font and letter size among different fonts and sizes individually in writing-related tasks.

3. **Remedial Teaching Techniques:** For the purpose of remedial teaching the following techniques were followed.

   - **For Reading:** Phonic training was provided to increase phonic awareness in readers. For phonic awareness examples were given and the phonic sounds associated with each alphabet in first and second languages were demonstrated. Demonstration of reading was also done in each session followed by engaging the participant in active reading. Prompting was done in case of each small step of difficulty faced by her. Each small step of successful reading is followed by verbal reinforcement. Spelling rules were explained. Participants were engaged in reading and preparing spelling hand in hand.

   - **For Writing:** Demonstration of participants' sitting posture was done. It was explained to hold the pencil in correct angel for effective handwriting. Space covered

by each alphabet was also explained. Handwriting, copying from books, writing to dictation, creative writing tasks was given. Grammar rules were explained.

4. **Procedure:** Participants were assigned to three groups equally. Group 1 was a control group who did not receive any intervention, Group 2 received pattern recognition training and group 3 received the remedial teaching techniques. Each group was exposed to pre and post testing conditions where Diagnostic Test for Learning Disability was administered. After the training the parental reports were also collected and their verbatim helped to understand and interpret the result.

5. **Result:** Pre and post test scores for Diagnostic Test for Learning Disability were collected. Due to the small sample sizes in each group, the results were analyzed using nonparametric statistical techniques. The Kruskal-Wallis and Friedman tests were used to determine group differences in both the pre- and post-testing phases.

Table 1: Mean Kruskal Wallis and Friedman test value for pre and post testing conditions.

	Pre test	Post test	
Group 1	5.5	5.8	0.31
Group 2	5.1	6.7	0. 03
Group 3	5.3	7.1	0.02
	0.35	0.04	

p > 0.01**, p > 0.05*

The result shows greater differences between pre and post testing conditions in case of Group 2 and 3 with increment in later conditions. the group difference is neither significant in pre testing conditions, nor in post testing conditions. However, pre and post test difference is significant at .05 levels only for group 2 and group 3.

Table 2: Post hoc comparison between each pair of groups:

	Man Whitney test significance
Group 1& 2	**0.05**
Group 1& 3	**0.03**
Group 2& 3	**0.23**

p > 0.01**, p > 0.05*

IV. DISCUSSION

The result shows that in comparison to the normal control group, group 2 and 3 has scored significantly higher. Thus, intervention is necessary for the group of children having learning difficulty. Without any specialized remedial plan, it is hard for the children to overcome learning problem.

Among the two intervention strategies the pattern recognition training is an indirect one which tries to sensitize the participants for the visual units necessary for processing the written letters. However, the remedial teaching technique is a direct intervention for reading and writing tasks. In both the cases the participants scored higher. Computer and software projects seem to be more engaging and inspiring for the kids than tasks requiring paper and pencil, according to experts like Kline and Lerner (2006). Therefore, both strategies can be used to rise one's learning score. Pattern recognition training, however, has significant impact on learning, as shown by the results. Working memory training has been shown to be successful in enhancing cognitive abilities, according to Dunning et al. (2012). Training in visual perception can aid since dyslexic readers are less sensitive to auditory and visual signals than regular readers are (Stein and Talcott, 1999).

Alkahtani (2016) has discussed the need for special education in learning problem. Stanovich (1988, 1992) noted that reading process and phonemic understanding is more important in learning than intelligence or listening comprehension. Harrell and Jackson (2008) have also demonstrated the effectiveness of individualized education plan in learning difficulty. The present study also supports that both interventions are producing highest benefit during the first one month in learning difficulty. As revealed by Table 2 there is no significant difference between Group 2 and 3. That suggests both the techniques are working almost equally to impact on learning scores. Apart from the learning scores the change in behavior of the adolescent girls were also recorded from the parental reports. From parental report it has been revealed that the groups who are given the pattern recognition tasks were more motivated to be engaged in pattern recognition task even when it is related to reading and writing. Using pattern recognition tasks seems to be more interesting as it resembles computer games, and it does not directly propel the children to sit in front of books. But when they are practiced in differing the two patterns who are close to each other, it helps them to read or write small units of written information's. The next step includes replicating the same task in paper and pencil mode, i.e., whatever pattern recognition task was given in computer screen, the same task of letter identification, word reversal, letter font identification etc. are also given in reading writing material. It seems the initial phase of reading and writing. Then gradually the targets shift from one stage to the other. Thus, the present study suggests that both remedial teaching and pattern recognition training are helpful to improve the learning of children with difficulty in learning.

V. CONCLUSION

From the above study it can be stated that learning difficulty needs intervention. It cannot be overcome without any therapeutic intervention. Comparing remedial teaching and training in pattern recognition, both are effective almost equally. Both ultimately aims at re-

ducing difficulty in reading and writing and both are facilitating learning. The parental report suggests that the group which received the pattern recognition training has its effect on motivation and interest in engaging in the therapeutic tasks as well as in learning activity.

VI. LIMITATION

The study has only taken the first one month of the therapy report, when the study will be extended for longer than it is expected to see the difference more prominently. The sample size too small in each group. The severity level of learning difficulty could not be held constant among the groups.

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