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EFFECTIVENESS OF ACTIVITY BASED PROGRAM IN ENHANCING FINE MOTOR SKILLS OF CHILDREN WITH DYSPRAXIA

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ABSTRACT

The plight in India is such that fewer than five percent of disabled children have access to education. One out of every nine children is suffering from learning as well as sight, speech, hearing, locomotive, and mental disabilities. But the numbers of 'special education' teachers are achingly few. When a disabled child has a right to education like other children, it is the duty of the system not only to educate them but also educate them under the same roof as the other children so that there is no marginalization. This paper focuses on the effectiveness of the researcher made activity based program in enhancing fine motor skills of children with dyspraxia. An experimental study was conducted with a sample of 30 children from the "Association of mentally challenged boys". They were administered the activity based program which would enhance their fine motor skills. The fine motor skills assessed in the program were Ocular Motor control, Hand-eye coordination, Manual dexterity and Sterognosis. It was found that there is a significant difference between Pre-Test and Post-Test scores of children with Dyspraxia with respect to the four components of fine motor skills. The study suggests that activity based modules could be designed by special educators to be used in the class room as the research empirically proves that activity based module had a positive effect in enhancing the Fine Motor Skills of Children with Dyspraxia.

KEYWORDS: Special Education, Dyspraxia, Fine Motor Skills, Activity based program

SPECIAL EDUCATION

Special education is the practice of educating children with special needs in a way that caters to their individual differences and needs (National Council on Disability, 1994). A higher level of personal & professional self-sufficiency and success in education and their community becomes achievable for the learners with this kind of a set up by the National Council. Individual planning and systematic monitoring arrangements of teaching procedures, adaptable equipment and materials, accessible settings are included in this system. A typical classroom education system is the need of the hour for these students.

Learning disabilities, emotional and behavioral disorders, physical disabilities and developmental disabilities (Morgan, et. al., 1993) with additional educational services are the common types of special needs to be included, from which these students are likely to benefit; services such as different approaches to teaching, the use of technology, a specifically adapted teaching area, and resource room.

Remedial Education can be designed for any student, with or without a special condition. But, Special Education, the one that requires to be designed in such a way that it can pay specific attention a student with a special need; the defining trait is simply that they have reached a point of under preparedness, regardless of why (Stainback and William C, 1996). For example, disrupted education, displacement by civil disorder or war, etc., can cause a special condition in even an intelligent person.

In most developed countries, teaching methods and environments are modified by the educators so that general education environments are served to the maximum number of students is served in. Special Education, therefore, is often regarded as a service in developed countries, rather than just a place. Many students can improve their academic achievements and reduce their social stigmas through integration.

A special education program should be customized to address each individual student's unique needs. Special educators provide a continuum of services, in which students with special needs receive varying degrees of support based on their individual needs (Goodman & Libby, 1990). Special education programs need to be individualized so that they address the unique combination of needs in a given student.

DYSPRAXIA

Dyspraxia means that movement and coordination are affected. The main problem is that messages from the brain are not being reliably transmitted to the body (The American Heritage Medical Dictionary, 2007). So in reality, dyspraxia does not directly change intelligence. It does, however, affect learning ability. So in this way, dyspraxia does create a "learning disability." The condition can lead to a full spectrum of problems with language, perception and thought.

Surprisingly, there is no known cause for dyspraxia in the majority of cases. The most up-to-date research indicates that the problem may lie with immature neuron development in the brain. This possibility runs counter to earlier belief that it was related to brain damage. No specific neurological abnormality has been found that would explain the presence of dyspraxia. The number of children with

dyspraxia is believed to represent anywhere from two to ten percent of the population (Diagnostic & Statistical Manual of Mental Disorders, 2013). The first symptoms of dyspraxia become evident when physical milestones are not reached at expected times. For example, most children learn to roll over, sit, crawl, stand, and walk within a range of certain ages. Children with dyspraxia often do not reach these milestones when expected. Physical movement is difficult in a variety of ways.

FINE MOTOR SKILLS

Fine motor skills involve the small muscles of the body that enable such functions as writing, grasping small objects, and fastening clothing (Kids Health, 2001). They involve strength, fine motor control, and dexterity. Fine Motor Skills can be defined as coordination of small muscle movement which occurs in fingers in coordination with the movement of eyes. In this study Fine Motor Skills includes Ocular Motor control: The ability of the eyes to follow and focus on an object in the field of vision as required; Hand-eye coordination: The ability to execute activities with hands, guided by the eyes requiring accuracy in placement, direction and spatial awareness; Manual dexterity: The ability to accurately manipulate the hands and fingers for neat handwriting, drawing, typing skills etc; Sterognosis: The ability to recognize unseen object using the sense of touch.

NEED AND RATIONALE OF THE STUDY

After much thought, discussion, reading and research, it is believed the part we are missing is thorough development of fine motor skills. While working with toddlers and pre-schoolers who were developmentally delayed, the researcher observed a common thread -- their cognitive development paralleled their fine motor development. This can be seen in the assessments that are used to evaluate the skill and in research done by Piaget, Montessori, and others. This was also evidenced by years of watching students develop. How many struggling students have fine motor difficulties -- poor hand writing, trouble copying from the board, poor cutting and coloring skills, low visual-perception skills, difficulty with puzzles and mazes, trouble identifying letters and numerals, as well as poor reading and writing ability. Research evidences that nine out of ten students who are struggling also have poorly developed fine motor skills.

Often we dismiss the fine motor skills because we are so concerned about the students' ability to read and write but what we fail to recognize is that fine motor skills are necessary for both reading and writing. All of the brain research has shown us that as learners we need to be able to connect to our world through our senses and continually make more sense of it through strengthening and building upon neural pathways. This can only be done by using our bodies to connect to the world. Therefore, there is a need to re-examine our lack of focus on fine motor development. Students need fine motor control for eye muscles to focus and distinguish letters, crossing midline, and tracking -- all essential skills for reading and writing. And beyond that, they need eye-hand control to develop good hand writing skills so that they can express themselves in written form. Hence the need to conduct this experimental study on assessing the fine motor skills of children with Dyspraxia.

REVIEW OF LITERATURE

Nonis and Jernice (2014) in their study on Gross motor skills of children with learning disabilities indicated that children with MLD were lagging behind their age-matched peers by approximately four years in terms of TGMD-2 test items. The skill mastery of children with MLD was significantly poorer for eight out of 12 TGMD-2 test items especially loco motor skills. The authors recommend a motor intervention programme which includes a deliberate plan to improve the skills of gallop, hop, leap, jump, slide, strike, dribble and roll. Coulson (2011) in the article 'Teaching the child with Dyspraxia. Though challenging for both pupil and teacher, the rewards are there' has noted that Children with dyspraxia thrive in a one-to-one teaching environment, where lessons can be tailored to their requirements and rate of progress. They also benefit from the stability a long-standing relationship with a 'significant adult' (such as the studio music teacher) can provide, particularly during the difficult transitioning years from primary to secondary schools. Nair, et. al., (2009) in their study on Fine Motor Skills of Wards with Special Needs Using Cluster Model of Cognition, introduced a novel cluster model along with a methodology which provides an ample exposure to the effectiveness of the training. Stansell (2007) in the study 'Giving a face to a hidden disorder: The impact of Dyspraxia' has addressed that educators have a unique opportunity to help children reach their full potential, but we must first be aware of the special needs for the dyspraxia child that should be acknowledged appropriately. Overall, studies have shown that children with disabilities tend to have poorer motor skills as compared with children with typical development.

OBJECTIVES OF THE STUDY

- To find out the difference in scores of Fine Motor Skills in children with Dyspraxia with respect to age.
- To evaluate the effectiveness of the activity based program on children with Dyspraxia.

HYPOTHESES OF THE STUDY

Hypothesis 1:
There is no significant difference in the Pre-test, Post-test and Module scores of fine motor skills in the children with Dyspraxia across age.

Hypothesis 2:
There is no significant difference in the Pre-test and Post-test scores of Fine Motor Skills in children with Dyspraxia with respect to Ocular Motor Control, Hand-Eye Coordination, Manual Dexterity and Sterognosis .

DESIGN OF THE EXPERIMENT

This experiment design involves 30 children from the "Association of mentally challenged boys". These children belonged to a single group. First a Pre-test was administered to all the students in a common hall under common conditions. After one week the treatment began. A module containing 12 activities was administered to all the students in a span of 2 months. The module had content covering ocular motor control, hand-eye coordination, pincer grasp, sitting tolerance and manual dexterity which are the main focus for improvement in fine motor skills. The individuals were seated in a classroom where after modeling the concerned activity and under the supervision of the instructor they had to perform the activity all by themselves. The role of the instructor supervising them was

to check if the activity was performed in the right matter and graded them for individual activities. The students were given a period of 30-40 minutes for each activity. After a span of 10 days a Post-test was administered to all the students in a common room, where each had to perform the activities individually. The Pre-test and Post-test was constructed covering the aspects of Fine Motor Skills i.e. ocular motor control, hand-eye coordination, pincer grasp, sitting tolerance and manual dexterity.

TOOLS USED FOR THE STUDY:

Pre-Test

A seven activity Pre-test was constructed by the researcher covering ocular motor control, hand-eye coordination, pincer grasp, sitting tolerance and manual dexterity. The test items were carefully constructed keeping in the view of the objectives and abilities that were to be measured. Blue print was made before construction the items. Care was taken to see that all the activities mentioned in the pre-test were for the level of the children and covering the skills that were required to be enhanced during the experimental period. The pre-test was then given to the guide, 2 special educators and 1 occupational therapist. The reports got from the experts were scrutinized and necessary changes were accommodated in the final draft of the pre-test paper. Thus the content validity of this tool was established.

Post-Test

A seven activity Post-test was constructed by the researcher covering ocular motor control, hand-eye coordination, pincer grasp, sitting tolerance and manual dexterity. The post-test items were parallel to the pre-test items. Blue print was made before construction the items. Care was taken to see that all the activities mentioned in the post-test were for the level of the children and covering the skills that were required to be enhanced during the experimental period. The post-test was also given to the guide, 2 special educators and 1 occupational therapist. The reports got from the experts were scrutinized and necessary changes were accommodated in the final draft of the post-test paper. Thus the content validity of this tool was established.

ACTIVITY BASED PROGRAM

One module with twelve activities was carefully constructed by the researcher covering ocular motor control, hand-eye coordination, pincer grasp, sitting tolerance and manual dexterity. Every item in the module was in the activity form. Each activity had a specific objective to attain. The activities in the module were arranged in a very sequential manner, from simple to complex. The module was then given to the guide, 2 special educators and 1 occupational therapist. The reports got from the experts were scrutinized and necessary changes were accommodated in the final draft of the module. Thus the content validity of this tool was checked. This module was then tried out on a tryout group of 10 children at the “U&I Care”, Bengaluru. A maximum time of 40 minutes was given for completion of the activity. After scoring the activities, it was checked for clarity and appropriateness of the activities. It was noted that all the 10 students were able to comprehend and follow the activities that were given.

FINDINGS OF THE STUDY

Hypothesis 1: There is no significant difference in the Pre-test, Post-test and

Module scores of fine motor skills in the children with Dyspraxia across age.

Table 1: Indicating t-value and significance value of Pre-test, Post-test and Module score of fine motor skills in children with Dyspraxia across age.

	Age	N	Mean	Std. Deviation	df	t value	Sig.
Pre-Test	<13	15	1.3053	.20781	28	.255	.800
	>14	15	1.2847	.23500			
Post-Test	<13	15	2.4193	.24312	28	1.074	.292
	>14	15	2.3360	.17651			
Module score	<13	15	1.9220	.42229	28	1.057	.299
	>14	15	1.7780	.31607			

The above table indicates the pre-test means for age <13 were found that (M=1.31 SD=.21), and >14 (M=1.28, SD=.24); t (28) = .255, p=.800. The post-test means for age <13 were found that (M=2.42 SD=.24), and >14 (M=2.34, SD=.18); t (28) = 1.07, p=.292. The mean of module scores for age <13 were found that (M=1.92 SD=.42), and >14 (M=1.78, SD=.32); t (28) = 1.06, p=.299. There is no significant difference in pre-test, post-test and module scores with respect to age. These results suggest that age difference do not affect the scores of children with Dyspraxia. The null hypothesis is accepted: There is no significant difference in the Pre-test, Post-test and Module scores of the four components of fine motor skills in the children with Dyspraxia across age.

Hypothesis 2: There is no significant difference in the Pre-test and Post-test scores of Fine Motor Skills in children with Dyspraxia across the four components.

Table 2: Indicating t-value and significance value of pre-test and post-test scores of fine motor skills in children with dyspraxia across four components.

	N	Mean	Std. Deviation	df	t value	Sig
Pre-Test Ocular Motor	30	1.27	.37	29	19.00	.000
Post-Test Ocular Motor		2.38	.43			
Pre-Test Hand-eye coordination	30	1.35	.28	29	26.81	.000
Post-Test Hand-eye coordination		2.42	.34			
Pre-Test Manual Dexterity	30	1.37	.49	29	15.27	.000
Post-Test Manual Dexterity		2.27	.44			
Pre-Test Sterognosis	30	1.10	.31	29	19.75	.000
Post-Test Sterognosis		2.33	.48			

The above table indicates the means for pre-test Ocular Motor (M=1.27, SD=0.37) and post-test Ocular Motor (M=2.38, SD=0.43);

t=19, p=.000; The means for Pre-test Hand-Eye Coordination (M=1.35, SD=0.28) and post-test Hand-Eye Coordination (M=2.42, SD=0.34); t=26.81, p=.000; The means for Pre-test Manual Dexterity (M=1.37, SD=0.49) and post-test Manual Dexterity (M=2.27 SD=0.44); t=15.27, p=.000; and the means for Pre-test Sterognosis (M=1.10, SD=0.31) and post-test Sterognosis (M=2.33 SD=0.48); t=19.75, p=.000. It is evident that there is a significant difference between pre-test and post-test scores with respect to Ocular Motor Control, Hand-Eye Coordination, Manual Dexterity and Sterognosis at 0.01 level. Hence the null hypothesis is rejected and the alternate hypothesis is accepted, which means that there is a significant difference between the Pre-test and Post-test scores with respect to Ocular Motor Control, Hand-Eye Coordination, Manual Dexterity and Sterognosis.

IMPLICATIONS OF THE STUDY

From the findings the educational implications for improving, imparting and enriching the fine motor skills of children with dyspraxia are drawn: Improving Fine Motor Skills can in turn lead to improvement in academic functioning and in the betterment of the handwriting of children with Dyspraxia. A well designed activity based module will aid students to enhance learning. In the light of RTE, and the inclusion of students from diverse learning backgrounds, teachers must be sensitive to differences in entry level and comprehension ability in the classroom. The study illustrates the importance of tailoring content and curriculum to the specific needs and requirements of the learner. Creating competencies in Fine Motor Skills is critical to building learner independence within the classroom and in daily activities necessary optimal functioning in society.

CONCLUSION

The study resulted in proving the effectiveness of the Fine Motor Skills module in improving Fine Motor Skills in children with Dyspraxia. An improved Fine Motor Skills can help the children with their writing skills and their day to day activities. This in turn can help these children in improving their cognitive abilities to perform better at several tasks. This will further help them to adjust better with themselves and their surroundings. A sense of independence is awoken within the children as a result of enhanced Fine Motor Skills. The modules enhanced the Fine Motor Skills of children with Dyspraxia. Four components namely Ocular Motor Control, Hand-Eye coordination, Manual Dexterity & Sterognosis were included as part of the module to adjust the different aspects of Fine Motor Skills. The activity based learning approach did show higher Post-test scores proving the effectiveness of the module. This study concluded that on an average, activity based model had a positive effect in enhancing the Fine Motor Skills of Children with Dyspraxia.

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