

**Enhancement of Learning Achievement in
Mathematics of Handipaeed Children Through
Activity Based Teaching**

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ENHANCEMENT OF LEARNING ACHIEVEMENT IN MATHEMATICS OF HANDICAPPED CHILDREN THROUGH ACTIVITY - BASED TEACHING.

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Introduction

Various research studies have reported that learning achievement of primary school children in general and mathematics in particular is far from satisfactory. The first survey of achievement of primary school children in mathematics conducted in 1965-66 (Kulkarni, 1970) & the second national survey on attainment of primary school children in mathematics and language conducted by Shukla et al., in 1990 revealed low levels of learning achievement. Similar studies undertaken by Dave and others (1988), Shukla et al., (1994), NCERT, NIEPA and New Concept Consultancy (1995), Saxena et al., (1995), Prakash and Panda (1996) have also reported that numeracy and computational skills of primary school children are extremely low.

In the age of science and technology, a strong base of mathematics is absolutely necessary for all. Therefore how to develop the basic mathematical competencies among young children has been a problem for teachers, researchers etc. keeping in view the developmental level of primary school children, developmental psychologists like Piaget, Bruner have emphasized the use of concrete objects for the development of *mathematical concepts and skills*. Mathematics is basically abstract in nature and to learn its various concepts, principles and rules, child must be exposed to *various context-specific activities with concrete objects*. The NPE (1986) and its programme of action have also recommended that child-centred and activity-based process of learning should be adopted at the primary stage. First generation learners should be allowed to set their own pace and be given supplementary remedial instruction. As the child grows, the component of cognitive learning will be increased and skills organized through regular practice. In the context of primary mathematics,

M.L.L. document (1991) has specified that concrete objects and mathematical equipment need to be used through out the primary state in mathematics. Therefore it is needless to mention the importance of activity-based teaching for the development of mathematical competencies among primary school children. This idea has well tested support from empirical studies.

Many researchers are constantly engaged to study the effect of remedial measures using various activity-based strategies on the attainment level of primary school children. Das and Barua (1968), Rastogi (1983), Dutta (1986), Bhardwaj (1987), Bhanja (1990), Mishra (1991), Das (1996, 1998), Dash (1996), Panda (1996), Goel (1997), Sahu (1997), Behera (1998), Singh (1998), Tewari (1998) designed their studies to identify specific learning difficulties of elementary school children in mathematics and provided remedial measures in form of self-learning activities with adequate scope for practice. The findings of their studies have revealed that these intervention strategies have really enhanced the learning achievement of children in mathematics.

But unfortunately most of these researches have taken general children as their sample without giving due attention to handicapped / disabled children, who constitute a reasonable segment of the children studying in primary schools. It has been really a neglected area. From the point of universalization of elementary education it is equally important to understand the problem of this category of children very carefully and provide appropriate interventions for qualitative and quantitative improvement of their education. Major reasons for inadequate number of research in this field studies may be due to lack of interest and expertise among the research institutions and researchers. Therefore it is high time for the researchers to give their due attention to this group of children and provide research-based intervention strategies for improving their learning out-comes. With this background in view, the present study has been designed with the following objectives :

Objectives

1. To identify the learning difficulties of handicapped primary school children in mathematics .
2. To provide remedial teaching through activity -based approach using concrete materials.
3. To determine the effect of remedial teaching on learning achievement of handicapped children.
4. To compare the learning achievement of handicapped boys and girls after the remedial teaching.

Hypotheses

1. There exists learning difficulties in mathematics of handicapped children at the primary level.
2. Activity-based teaching will enhance learning achievements of handicapped children in mathematics irrespective of sex.

Methodology

Sample

All the 14 class -II deaf children of Sri Harsha Mishra Memorial Deaf School, Bhubaneswar were taken as sample. These students possessed addition and subtraction skills but poor in multiplication and its related skills as reported by the concerned mathematics teacher of the school on the basis of their classroom performances.

Tools

Two parallel forms of diagnostic tests were constructed on competencies related to multiplication for class -II . These competencies are "concept of multiplication as repeated addition and symbol of 'x' & '=' (2.2.7 & 2.2.8)" "Multiplication tables of 1,2,3,4,5, & 10 (2.2.9)" and "Day to day word problems on multiplication (2.2.10)". The investigator developed two sets of 17 diagnostics test items in each set with 6 items related to sub-competencies 2.2.7 and 2.2.8, carrying 1 mark each, 8 items related to 2.2.9 carrying 1 mark each and 3 items related to 2.2.10 carrying 2 marks each. The total mark assigned for 17 items of each set was 20. The first set of questions was meant for pre-testing and post-testing after the end of second session of remedial teaching and the second set was meant for post-testing after first remedial teaching.

Design and Procedure

The single group pre-test and post-test design was planned for this study . Accordingly 14 deaf children of class II were tested through first set of diagnostic test as the pre-test. Those who secured 80% and above of the maximum score. (i.e. 20) were levelled as Masters (M) and rest were Non-masters (NM). With the help of the Mathematics teacher of the school, the investigator conducted activity-based teaching for 4 weeks using activity-based materials developed by Regional Institution of Education, Bhubaneswar(1998). The concept of multiplication, its symbol and tables were developed using concrete objects and figures followed by guided practice activities for joyful learning and problem solving. Then post-test-1 was administered over 14 children and as per the criteria indicated above Masters and Non-masters were classified. The Masters were given multiplication tables of 6,7,8,9 as enrichment lessons and Non-masters were further put under remedial teaching with another set of activities followed by second post-test. Pre-test and Post-test scores of deaf children on multiplication are given in Table-1 . Table-2 shows Pre-

test and Post-test mean scores of Masters and Non-masters . Percentage of Masters and Non-masters of the whole group (N=14), boys (N=8) and girls (N=6), before and after first and second phase of remedial teaching are given in Table -3 and 4 respectively.

Conceptual Framework of the Study

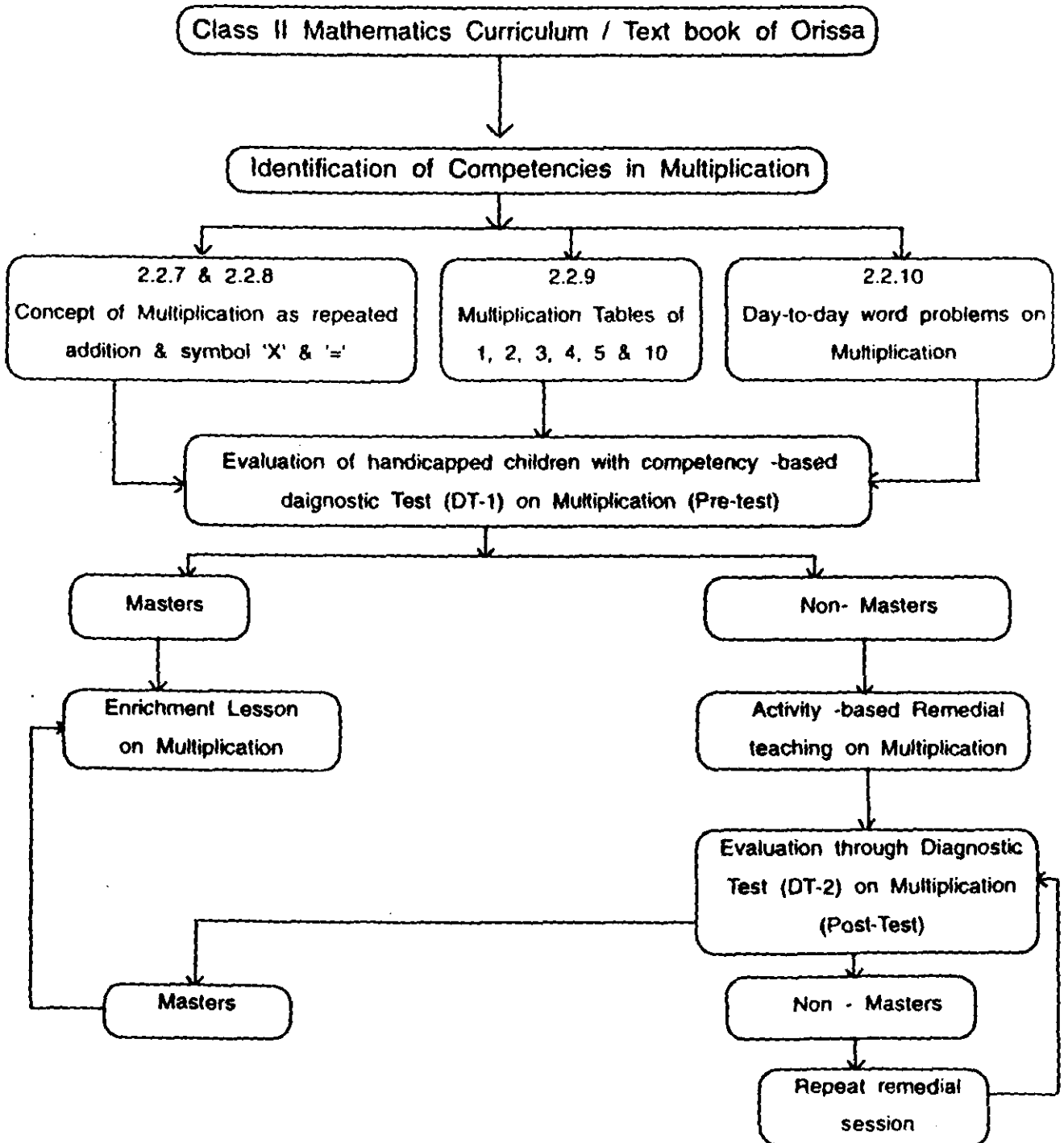


Table-1

Pre-Test & Post - Test (1&2) Scores of Class II Deaf Children (N=14) on Multiplication

Competency No. with M.S	Pre-test Scores					Post-test Score (1)					Post - test Score (2)				
Sl. No. of the Students	M.S. in 2.2.7 & 2.2.8	M.S. in 2.2.9	M.S. in 2.2.10	Total M.S.	Remarks	M.S. in 2.2.7 & 2.2.8	M.S. in 2.2.9	M.S. in 2.2.10	Total M.S.	Remarks	M.S. in 2.2.7 & 2.2.8	M.S. in 2.2.9	M.S. in 2.2.10	Total M.S.	Remarks
1(B)	5	5	2	12	NM	6	7	3	16	M-	-	-	-	-	-
2(B)	5	6	2	13	NM	6	7	5	18	M	-	-	-	-	-
3(B)	4	4	1	09	NM	5	4	3	12	NM	6	7	3	16	M
4(B)	5	6	4	15	NM	6	8	6	20	M	-	-	-	-	-
5(B)	5	6	3	14	NM	6	8	5	19	M	-	-	-	-	-
6(B)	5	5	3	13	NM	6	6	4	16	M	-	-	-	-	-
7(B)	3	3	0	06	NM	4	3	1	08	NM	5	5	1	11	NM
8(B)	2	2	0	04	NM	4	2	0	06	NM	5	4	1	10	NM
9(G)	5	4	3	12	NM	6	7	4	17	M	-	-	-	-	-
10(G)	4	5	0	09	NM	5	6	2	13	NM	6	8	3	17	M
11(G)	4	5	1	10	NM	5	5	2	12	NM	6	8	2	16	M
12(G)	4	2	0	06	NM	5	4	0	09	NM	5	5	2	12	NM
13(G)	3	2	0	05	NM	4	3	1	08	NM	5	4	1	10	NM
14(G)	3	3	0	06	NM	4	3	1	08	NM	5	4	1	10	NM

B = Boy

M = Master

M.M. = Maximum Mark

M.M. for 2.2.7 & 2.2.8 Competencies is 6

G = Girl

NM = Non-Master

M.S. = Mark Secured

M.M. for 2.2.9 Competency is 8

M.M. for 2.2.10 Competency is 6

Table-2

Pre-test & Post-Test (1 & 2) Mean Scores of Masters & Non-Masters in Multiplication

Test	Pre-test	Post-test (1)	Post test (2)
Group	Mean Score	Mean Score	Mean Score
Masters	0.0 (0)	17.67 (1.63)	16.33 (0.39)
Non-Masters	9.57 (3.67)	9.50 (2.51)	10.60 (0.89)

Figures in the parentheses indicate standard deviation

Table-3

Percentage of Masters & Non-Masters on Multiplication Before & After First and Second Remedial Teaching

Remedial Teaching	Masters		Non-Masters	
	Number	Percentage	Number	Percentage
Before first Remedial Teaching	Nil	0	14	100
After first Remedial Teaching & Before Second Remedial Teaching	06	42.86	08	57.11
After Second Remedial Teaching	03	37.50	05	62.50

Table-4

Percentage of Masters & Non-Masters on Multiplication in terms of Boys & Girls Before & after first & second Remedial Teaching

Remedial Teaching	Masters				Non - Masters			
	Boys		Girls		Boys		Girls	
Before first Remedial Teaching	No.	%	No.	%	No.	%	No.	%
		Nil	0	Nil	0	8	57.11	6
After first remedial Teaching & before Second Remedial Teaching	5	62.50	1	16.66	3	37.50	5	83.33
After Second Remedial Teaching	1	33.33	2	40	2	66.66	3	60

Discussion

From Table -1, pre-test scores clearly revealed that all 14 deaf children were found to be non-masters on multiplication. From post-test (1) score, it was found that 6 students acquired mastery level competencies and 8 students continued as non-masters, although they improved their achievement score as compared to their pre-test scores. After the second phase of remedial teaching, it was found that only 3 students acquired mastery level and remaining 5 failed to do so although they improved their achievement scores. From the first and second phase of remedial teachings it was clear that, activity-based teaching has certainly enhanced learning achievement of children in multiplication. But pre-test and post-test scores on word problems were extremely low which may be due to language deficiency and other related arithmetics skills. This finding is consistent with the findings of Jitendra et al., (1998). This demands adequate practice for which more time is required. Pre-test and Post-test mean scores of Masters and Non-masters as presented in Table-2 confirm the trend of improvement of the deaf children in multiplication.

Table-3 shows percentages of Masters and Non-masters in multiplication before and after remedial teaching. The trend clearly shows that after first remedial teaching 42.86 percent of children have become masters and at the end of second remedial teaching another 37.50 percent of children acquired mastery level competencies in multiplication. Masters and Non-masters in respect of sex have been given in Table-4 before and after remedial teachings. This indicates that 62.50 percent of boys and 16.66 percent of girls acquired mastery level after first remedial teaching and 33.33 percent of boys and 40 percent of girls were found to be masters and non-masters respectively after second remedial teaching. The findings of the study revealed as a whole boys exceeded girls on mastery level, so far as multiplication competencies are concerned.

Major Findings

1. Activity-based teaching on multiplication has enhanced learning achievement of class-II deaf children.
2. Solving word problems on multiplication was found to be difficult for deaf children irrespective of sex.
3. Boys excel girls in acquiring mastery level in multiplication. This may be due to poor addition skills of girls which is essential for acquiring skills on multiplication.
4. Deaf children were found to be more motivated towards activity-based teaching and gradually gained confidence through this approach.

Educational Implications

1. The strategies used in this study to make children learn mathematics effectively shall be of great help to the teachers who handle these children.

2. Activity-based approach motivates children to learn better and hence leads to better achievement.
3. It provides immense opportunities for the children in solving problems.
4. This study may provide feed-back to teachers to develop alternative remedial strategy and use it, if a set of activities fail to help the learners for better learning. In other words, the teachers may take up action research to find solutions of the problems encountered by them in their class-rooms.

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