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"Nai Talim Experiential Learning in Mathematics for Primary School Children: A Study of Action Research"

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ABSTRACT REPORT OF AN ACTION RESEARCH

Most of the primary school children have expressed their difficulty in learning the four fundamental operations like additions, subtractions, multiplications and divisions in Mathematics. The teachers' involvement is observed to be more in the teaching learning process while teaching Mathematics in the classroom. It is thought that the students can understand the fundamental operations in Mathematics better when they are actively involved in the teaching learning process. Participatory Learning and Action (PLA) has been proved a better technique to make the students understand the fundamental operations.

Out of the four fundamental operations, the students of Class-IV have identified the multiplications and divisions difficult as compare to additions and subtractions. Hence, the researcher thought of teaching multiplications and divisions using Nai Talim experienced learning involving the students in various activities.

The researcher has contacted the teacher teaching Mathematics to the children of Class-IV studying in M.P. Model Primary School; Allinagaram Village in Etcherla Mandal of Srikakulam District and interacted with the teacher. Hence, the researcher started teaching the two basic operations viz., Multiplication and Division to the Class IV children using Nai Talim Experiential Learning.

Some activities have been taken up in the class room for teaching multiplications and divisions by the researcher. On the basis of analysis and interpretation of results, the findings are arrived at and conclusions are drawn. From this study it is understood that Nai Talim Experiential Learning has been proved a better method of developing problem solving skills among the primary school children in multiplications and divisions while teaching mathematics.

KEY WORDS: Fundamental Operations, Abacus, Group Activities, Participatory Learning and Action, Nai Talim, Experiential Learning.

FULL REPORT OF AN ACTION RESEARCH

INTRODUCTION:

Mathematics has been described as the queen and servant of Science. And Mathematics is a subject which many adults have found difficult in their childhood because Mathematics is an abstract subject.

Most commonly, Mathematics is called a science of logical reasoning. It always settle in the mind a habit of reasoning. The reasoning in Mathematics is of particular kind and possesses a number of characteristics such as simplicity, accuracy, certainty of results, originality, similarity to the reasoning of life and verification.

Today the society has undergone tremendous changes. At present, knowing mathematics means being able to use mathematics in purposeful ways and thinking rather than rote learning of rules and procedures. The emphasis of school mathematics has changed from careful rehearsal of standard procedures to a focus on mathematical thinking, development of skills and communication to prepare them for the world of tomorrow.

By the time of admitting school, children starts to develop their fundamental mathematics skills. Mathematics makes it possible for children to solve simple number based problems. Through the use of mathematics, students can add up store purchases, determine necessary quantities of objects and estimate lengths. While the discipline of mathematics does become quite complex, there are some fundamental mathematics skills that every children can and should learn during their mathematics education.

After developing a complex understanding of addition and subtraction, primary school children move on to learn multiplications and divisions. Depending on the student's mathematics achievement level, may starts learn fundamental operations as early as first place. As with addition, students' learn of these fundamental operations starts with single digit problems. As they develop their multiplication and division skills, the problems become increasingly complex, involving larger numbers.

Primary level school mathematics has undergone a number of changes to concretise the abstract ideas in the minds of the children is a difficult task. For the effectiveness of teaching mathematics at primary level, teaching should be child centred with proper motivation like use the technique of Nai Talim Experiential Learning. Also teaching Mathematics at primary level will be more effective if the teacher teaches through games, puzzles, songs, Abacus, Mathematics Kit Items, and etc. by the method of experiential learning.

PROBLEM DESCRIPTION OF THE STUDY:

Most of the primary school children have expressed their difficulty in learning the four fundamental operations like additions, subtractions, multiplications and divisions in Mathematics. The teachers' involvement is observed to be more in the teaching learning process while teaching Mathematics in the classroom.

It is thought that the students can understand the fundamental operations in Mathematics better when they are actively involved in the teaching learning process. Participatory Learning and Action (PLA) has been proved a better technique to make the students understand the fundamental operations.

It is thought relevant to involve the students in taking up different activities for themselves in order to make them understand simple concepts relating to additions, subtractions, multiplications and divisions. Out of the four fundamental operations, the students of Class-IV have identified the multiplications and divisions difficult as compare to additions and subtractions.

Hence, the researcher thought of teaching multiplications and divisions using Nai Talim experienced learning involving the students in various activities.

REVIEW OF LITERATURE OF THE STUDY:

Narsinga Rao E., (1985) studied "An experiment on the effectiveness of the activity based instruction over traditional method of teaching in the project primary schools of Andhra Pradesh". He reported that activity based method is superior over the traditional method. The research adopted the experimental method. He has selected the topic "Number Place Value" in Mathematics.

Sharma (1992) studied "An investigation into the effectiveness of activity based approach in the teaching of primary school subjects". The result of the study have been proved very effective. The average level of the effective use of this activity based approach in the teaching of primary school subjects is very high.

OBJECTIVES OF THE RESEARCH STUDY:

1. To provide the students an opportunity to participate in the teaching learning process.
2. To involve the students actively in learning the fundamental operations in Mathematics.
3. To develop in the students an awareness with regard to the basic operations, viz., multiplications and divisions in Mathematics in solving the problems for themselves.
4. To elicit information from the students basing on their experiences to develop the steps in solving different problems on the above two fundamental operations
5. To make the students share their views in groups in order to develop in them problem solving skills.

HYPOTHESIS OF THE RESEARCH STUDY:

Nai Talim Experiential Learning would provide better understanding of multiplications and divisions in Mathematics among Class-IV children studying in Primary Schools.

STRATEGIES PLANNED TO ADDRESS THE PROBLEM:

Action Steps / Action Cycles

The students are exposed to Participatory Learning and Action (PLA). The students participate actively in the teaching learning process. They also exchanged their views in solving different problems relating to multiplications and divisions in learning Mathematics.

PRE- TEST CONDUCTED BY THE RESEARCHER
TO PRIMARY SCHOOL CHILDREN

Activities of the Experimental Learning Action Research:

Activities suggested to develop four fundamental mathematical operations like addition, subtraction, multiplication and division techniques / skills among Class-IV children.

- Counting of numbers providing a good number of objects to the children. Example books, pens, coins, tamarind leads buttons, pennies, soup cans, trees, cars and etc.,
- Counting apples is a great math lesson, but counting apples, oranges and watermelons together expands child thought learning experience process.
- Puzzles to solve simple problems on addition and multiplication
- An ABACUS and Flash cards can be used to teach kids addition, subtraction, multiplication and division.
- Play way techniques providing experiences to children.
- Dividing children into various groups equally in the required numbers.
- Shifting of children from one group to another group in order to make them experience the technique of subtraction.
- The students are engaged in the activity of using ABACUS for the fundamental operations – multiplications and divisions

- The students asked to count the number of benches in the class room and the number of students in each bench. Their students are asked to count the total number of students in the class room.
- Now the students experience and understand that total number of students in the class is equal to the sum of students siting on different benches. Thus, understand that multiplication is nothing but an extension of addition.
- Similarly, the above said process will be implement for teaching divisions also.

IMPLEMENTATION OF ACTION RESEARCH STEPS:

- Arranging children to sit in different roles.
- Re-arranging them into different groups.
- Shifting of children one group to another group
- Matching numbers to the objects show in a pictures.
- Taking the students to different classes involving them to count the children in each group.
- look at all of the physical objects you can count, add, subtract and multiply
- Use chalk to scribble numbers on the driveway and quiz school children with mathematics questions they have to answer by running to the correct number.
- Begin basic counting skills with blocks. Mathematics can become an activity they enjoy rather than an educational drill.
- Children develop the problem-solving skills by the experiential learning approach. Where using an abacus, group of numbers each coloured bead represents to accurately use it.
- Multiplication of two numbers is equivalent to the addition of a number to itself as many times as the value of the other one number is.
  Think of it like this: you have 5 groups of pens and each group has 3 pens. One of the ways you can find out how many pens you have is this one:

- 3 pens + 3 pens + 3 pens + 3 pens + 3 pens = 15 pens in total

- You can see that it is way too much work, so you can use multiplication to solve this problem:

- 5 group of pens x 3 pens in every group = 15 pens in total

- Division is the fourth basic math operation. Basically, you can say that dividing means splitting objects into equal parts or groups. For example, you have 12 pens that need to be shared equally between 4 students. So, how many pens will each person get? Each person will get 3 pens (12 pens / 4 people = 3 pens per person).


ACTIVITIES DONE BY THE CHILDREN TOWARDS FUNDAMENTAL OPERATIONS

PROCESS OF IMPLEMENTATION OF THE STUDY:

The researcher has contacted the teacher teaching Mathematics to the children of Class-IV studying in M.P. Model Primary School, Allinagaram Village in Etcherla Mandal of Srikakulam District and interacted with the teacher.

The teacher expressed views on the backwardness of certain students of Class-IV in learning mathematics. Except 4 or 5 students, rest of the students are identified as slow learners in respect of the two basic operations viz., multiplications and divisions.

The teacher also express opinion that the students are unable to know certain facts like (i) multiplication is nothing but an extension of addition, and (ii) division is nothing but an extension of subtraction. Further it is observed that the students are not upto the mark in Mathematics Tables.

Under these circumstances, the researcher advised the teacher to follow the method of experiential learning in developing these skills with the active involvement of students in the process of learning.

Hence, the researcher started teaching the two basic operations viz., Multiplication and Division to the Class-IV children using Nai Talim Experiential Learning. The following activities have been taken up in the class room for teaching multiplications and divisions.

The students will be asked to count the number of objects (tamarind seeds, leaves, flowers and etc.,) in each bunch and then make them add. Finally, they will be asked to count the no. of bunches and no. of objects in each bunch. Now, they identify that multiplication is an extension of addition. The above process will be continued for teaching divisions also.

POST- TEST CONDUCTED BY THE RESEARCHER TO PRIMARY SCHOOL CHILDREN

EVALUATING THE RESULTS OF ACTION RESEARCH:

Population: Primary School Students

Sample : Class-IV students of M.P. Model Primary School, Allinagaram Village of Etcherla Mandal located in a rural area in Srikakulam Dt.

Sample Size ***:*** 22 members

Duration for the Completion of Action Research Project ***:*** *20 days*

Time Frame:

Sl. No.	Activity	Period of the Days
1	Interaction with the School Head Master and School Teachers	1
2	Interaction with the Class Teacher Teaching Mathematics	2
3	Interaction with the students	3
4	Conduct of Pre-Test	1
5	Teaching by the Researcher using Nai Talim Experiential Learning Method	6
6	Conduct of Post-Test	1
7	Discussion about Nai Talim Technique along with Teachers and Students	2
8	Statistical computations for Pre-test and Post-test	2
9	Drawing Conclusions and arriving at Findings	2
	TOTAL	**20**

Method ***:***

The researcher used the *E*xperimental Method.

Sampling Technique :

The researcher used the Purpose Sampling

Tool :

The researcher prepared tool using pre-test and post-test design and accordingly the researcher has prepared the question papers and administrated them to Class-IV children for the purpose of present study.

Data Collection :

The researcher collected data from children of Class-IV and analysed the data using simple statistics. The quantification was made by the researcher and the data were analysed for purposes of interpretation.

Statistical Techniques:

The researcher will deploy statistical techniques viz., Mean, Standard Deviation and t-Test for analytical purposes.

FINDINGS OF THE ACTION RESEARCH:

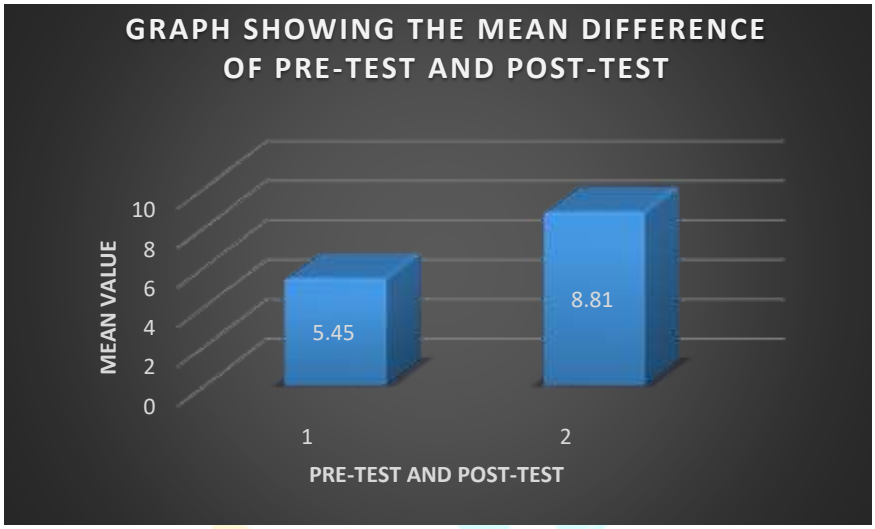
TABLE SHOWING THE DIFFERENCE BETWEEN TWO MEAN GROUPS OF PRE-TEST AND POST-TEST TOWARDS CHILDREN ACHIEVEMENT

	N	Mean (M)	Standard Deviation (S.D.)	t- Test
Pre-test	22	5.45	1.23	3.74
Post-test	22	8.81	0.77	

@ Significant at 0.05 and 0.01

Since the mean score value for post-test (8.81) is higher than that of the pre-test (5.45). Hence, it is revealed that the performance of students is better in post-test as compare pre-test. It is conclude that their improvement in their performance due to the implementation of Nai Talim Experienced Learning.

As above Table Values, t-Test value (3.74) is higher than to actual t-Table value (2.62 & 2.69) at both levels of significance 0.05 and 0.01. So, hypothesis is rejected at both levels and also alternative hypothesis (Nai Talim Experiential Learning) is accepted at both levels. There is a significance between pre-test and post-test groups at both levels. Hence, the Nai Talim Experiential Learning is more effective in the achievement test of Class-IV Children in Mathematics.



CONCLUSION OF THE ACTION RESEARCH :

On the basis of analysis and interpretation of results, the findings are arrived at and conclusions are drawn. From this study it is understood that Nai Talim Experiential Learning has been proved a better method of developing problem solving skills among the primary school children in multiplications and divisions while teaching mathematics.

REMARKS OF THE TEACHERS AND STUDENTS:

Teachers expressed their view point that the method of experiential learning is highly useful to the students of primary schools where learning by doing is experienced by students. Students also felt very happy and expressed that they have learnt the concepts of multiplication and division very easily with help of the new method (i.e., Nai Talim Experienced Learning)

SUGGESTION OF THE STUDY:

The present study has revealed that fundamental operations can best be developed among primary school children following the activities of Nai Talim Experiential Learning in the Mathematics.

ARRANGEMENT FOR DISSEMINATION OF THE FINDINGS:

The results / findings of the action research will be communicate to the teachers and the administrators of primary schools with a request for inclusion of Nai Talim Experiential Learning in the school curriculum at Primary level in developing mathematical fundamental operations among the children.

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