A study on academic achievement of elementary grade learners of Arunachal Pradesh in mathematics: causes of poor academic achievement

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ABSTRACT

This study focused to find out the academic achievement of the elementary learners in Mathematics subjects. It is attempt to find out the causes of poor performance in mathematic subject. For this purpose, normative survey method of research has employed. The sample consists of 2097 government schools from eight districts of Arunachal Pradesh. The study indicates that hardly 10% learners are found above 60% marks in mathematics. It is interpreted that the 7th grade learners of Arunachal Pradesh are extremely poor in mathematics. Therefore, the teacher’s training in states need to work out the new strategies for the qualitative improvement of mathematics teachers. When the academic performance goes down, it is not only the students and teachers are at fault, but, the teachers’ Training Institutes are also equally responsible and these institutes need to understand their responsibilities on the state of Arunachal Pradesh. This study thus assumes significance as it will help the teacher to have a bird’s eye view on the existing poor performance of the subject.

INTRODUCTION

There is always a linkage between elementary education and higher education. If the foundation stage of mathematic subject in elementary level is not strong enough then it would directly results poor performance in secondary and senior secondary level. It is in general, observed that the most of the students who enrolled in higher education level are poorly performing in science and mathematics subjects despite their rigorous private tuitions. Today, any citizen of the modern world needs to know sufficient quantum of everyday science during their school education. The teachers should aim at awakening in the pupils a lively curiosity about the natural phenomena arousing in developing their capacity for the practical application of the knowledge at appreciating the tremendous impact of modern science on the aspect of their life. Therefore, the teaching and learning of science and mathematics subjects need to go in such a way that it becomes enjoyable for every learners in any of the institution, on the other hand, creating a fear in learning would cause deprive children of an important faculty for life. There are large number of studies pertaining to teaching and learning of mathematics subject such as Basu, C.K (1977) carried out a research on development of science and mathematics concepts in children at primary grades in India and the study found that on the whole urban children were faster in the acquisition of the science and mathematics concepts selected for the study.

Basher (1994) investigated that aided schools have shown positive effect on the achievement of learners in mathematics. Deshpande, P.G. (2004) worked on the Evaluation of Mathematics text book for class IV students and came out with the result that text book of mathematics need some substantial improvements to facilitate the 4th standard students in mathematics.

K.C. Kapoor, Dr. T. Lhungdim (2006) conducted a research on “Quality improvement at elementary school stage in Lower Dibang Valley and Lohit districts of Arunachal Pradesh’ and found that the mean of achievement scores in Science V and VIII grade learners in Lower Dibang Valley and Lohit district of Arunachal Pradesh are less than average scores (50% of marks i.e. 50 out of 100 marks). The Range of Deviation of Marks i.e. Difference in Lowest and Highest Scores is also maximum in science than other subject i.e. Mathematics and English at 5th and 8th Grade Learners in Lower Dibang Valley and Lohit District of Arunachal Pradesh.Prof. K.C. Kapoor and Sinha, B.P (2010) conduct Term End Achievement of 5th grade learners in mathematics and science of Academic Session 2009-10 in Arunachal Pradesh and the results found that the academic achievement of 5th grade learners of Arunachal Pradesh was found poor in science like the mathematics subject for the academic session 2009-10.

By looking into all these research studies pertaining to the teaching and learning of mathematics subjects, it is understood that the teaching and learning of mathematics subject need to be geared up by way of conducted researches and providing the required inputs in schools and particularly at the elementary level which is considered a foundation stage of learners in the field of academics. NCK (2006-09) has recommended some additional measures to raise the quality of science and mathematics at different levels. Further, it is important to note a visions statement of the National Focus Group on Teaching of Mathematics and Science (2006) and their vision of excellent mathematical education and science education is based on two premises that all students can learn mathematics and science.

The review of related literature shows that the researchers have conducted the studies at elementary school stage by taking the teaching and learning of science and mathematics by selecting the classes 5th and 8th. The investigator of the present study got motivated to study intensively the academic achievement of 7th grade learners in mathematics in view of certain selected variables and causes of poor performances. Therefore, the investigator took the following study in hand.
OBJECTIVES

1. To study the difference between the academic achievement mean scores of 7th grade male and female learners of Arunachal Pradesh in Mathematics (2013-14).
2. To study the difference between the academic achievements mean scores of 7th grade tribal and non-tribal learners of Arunachal Pradesh in Mathematics (2013-14).
3. To study the difference between the academic achievements mean scores of 7th grade urban and rural learners of Arunachal Pradesh in Mathematics (2013-14).
4. To identify the causes of poor performance in mathematics at elementary school stage in Arunachal Pradesh.

HYPOTHESIS

1. There is no significant difference between the academic achievement mean scores of 7th grade male and female learners of Arunachal Pradesh in Mathematics.
2. There is no significant difference between the academic achievement mean scores of 7th grade tribal and nontribal learners of Arunachal Pradesh in Mathematics.
3. There is no significant difference between the academic achievement mean scores of 7th grade urban and rural learners of Arunachal Pradesh in Mathematics.

METHODOLOGY

The present study was carried out by adopting descriptive survey method of educational research.

Sample:

For the present study the investigator used random sampling procedure. The sample of the study comprised of 2097 elementary 7th grade learner (Male 1087, female 1010) from eight districts of Arunachal Pradesh by adopting the random sampling technique.

Tools:

For the present piece of research work in order to forge the research findings the investigator used the following tools.

1. Questionnaire developed by Prof. K.C. Kapoor and Dr. T. Lhungdim (2014). Summative Criterion Test on Mathematics for Class VII.
2. Questionnaire developed by Prof. K.C. Kapoor and Dr. T. Lhungdim (2014). To identify the causes of Poor performance in mathematics at elementary school stage in Arunachal Pradesh.

Delimitation:

There are 17 districts in the state of Arunachal Pradesh out of these districts the investigator selected eight districts viz. East Siang, West Siang, Lower Subansiri, Upper Subansiri, Tawang, West Kameng, Papum Pare and Lower Dibang Valley Districts.

Statistical Techniques used:

After collection of the requisite data from the respective respondents the investigator adopted the statistical techniques like Mean scores, SDs, SED and t-test for analysis and interpretation of data.

ANALYSIS AND INTERPRETATION

Table -1. Showing Computed Academic Achievement Mean Scores, SDs, SED, and t-value of 7th Grades male and female learners of Arunachal Pradesh in Mathematics (2013-14).

<table>
<thead>
<tr>
<th>Group of learners</th>
<th>N</th>
<th>Mean Score</th>
<th>SD</th>
<th>SED</th>
<th>t-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Male</td>
<td>1087</td>
<td>33.84</td>
<td>19.02</td>
<td>1.81</td>
<td>1.34</td>
</tr>
<tr>
<td>Female</td>
<td>1010</td>
<td>33.41</td>
<td>17.93</td>
<td>1.71</td>
<td></td>
</tr>
</tbody>
</table>

Interpretation:

An examination into the table no.1 reveals that the computed t-value came out to be 1.34 which is lesser than the computed t-value (1.96) at .05 level of confidence for 2095 df, hence, the computed t-value (1.34) is not considered significant and the formulated hypothesis: “There is no significant difference between the academic achievement mean scores of 7th grade male and female learners of Arunachal Pradesh in mathematics” got retained. From this, it is interpreted that the 7th grade male and female learners do not differ much in their academic achievement mean scores of Mathematics. Both the groups are equally poor in mathematics.

Table-2 Summary of Computed Academic Achievement Mean Scores SDs, SED and t-value of 7th Grade Tribal and Non-Tribal Learners of Arunachal Pradesh in Mathematics (2013-14)

<table>
<thead>
<tr>
<th>Group of learners</th>
<th>N</th>
<th>Mean Score</th>
<th>SD</th>
<th>SED</th>
<th>t-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tribal</td>
<td>1580</td>
<td>35.23</td>
<td>18.435</td>
<td>0.95</td>
<td>2.345</td>
</tr>
<tr>
<td>Non-Tribal</td>
<td>517</td>
<td>33.01</td>
<td>18.77</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Interpretation:

For analysis of the table-2. shows that the computed t-value came out to be 2.34 which is slightly greater than the criterion t-value (1.96) at .05 level of confidence, hence, the computed t-value (2.34) has been considered significant and the formulated hypothesis: “There is no significant difference between the academic achievement mean scores of 7th grade tribal and non-tribal learners of Arunachal Pradesh in Mathematics” got rejected. From this, it is interpreted that the 7th grade tribal and non-tribal learners differ significantly in their academic achievement scores of mathematics. Further it has been observed that the 7th grade tribal learners performed slightly better than the 7th grade non-tribal learners in mathematics.

Table-3 Summary of Computed Academic Achievement Mean Scores SDs, SED, and t-value of 7th grade Urban and Rural Learners of Arunachal Pradesh in Mathematics (2013-14)

<table>
<thead>
<tr>
<th>Group of learners</th>
<th>N</th>
<th>Mean Score</th>
<th>SD</th>
<th>SED</th>
<th>t-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Urban</td>
<td>822</td>
<td>32.23</td>
<td>19.28</td>
<td>0.84</td>
<td>4.82</td>
</tr>
<tr>
<td>Rural</td>
<td>1275</td>
<td>36.27</td>
<td>17.87</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Interpretation:

The Table-3, reveals that the computed t-value came out to be 4.82 which is greater than the criterion t-value (2.58) at .01 level of confidence for 2095 df; hence, the computed t-value (4.82) has been considered significant and the formulated hypothesis: “There is no significant difference between the academic achievement mean scores of 7th grade urban and rural learners of Arunachal Pradesh in Mathematics” got rejected. From this, it is interpreted that the 7th grade Urban and Rural learners differ in their academic achievement of mathematics. Further it has been observed that the rural learners happen to perform a little better in mathematics than the 7th grade urban learners.

1. For analysis of Objective 3 the investigator found some of the Causes of Poor Performance in mathematics at Elementary School Stage:

2. The teaching-learning process of mathematics at elementary school stage is suffering due to unqualified and untrained teachers of mathematics in Arunachal Pradesh.

3. Academic Achievement of 7th Grade learners is also affected due to the shortage of teachers in the state.

4. It has been observed that the learners are extremely poor in basics of mathematics. The learners have been observed very weak in fundamental operations and other basic concepts computations.

5. Mathematics is a subject of practice, and the learners are not habitual of doing practice.

6. The text-books of mathematics for 7th grade classes have been examined and found absolute in thematic and activity based in nature. There is excessive use of language and illustrations as a result the basic concept in lost in the process.

7. Activities have been given but the teacher is unable to demonstrate those activities in the classroom due to the poor environment of the classroom and non-availability of the required materials.

8. Mathematics teachers are over burdened due to shortage of mathematics teachers and unable to take up all the suggested activities.

9. Text book is based on constructivist approach of teaching and learning for which the teachers need to be trained.

10. Teachers need to be trained on new approaches of mode transaction and new changes envisaged in NCFSE 2005.

11. Medium of Instruction in English language and the learners are so poor in English that they are unable read the text book and understand the concept. The statement of the question is not being understood.

12. Teachers and learners are not very clear about the general and specific objectives of the units. These objectives have also been given in the beginning of each unit.

RESULT AND DISCUSSION

Therefore, while looking at the academic achievement and the causes of poor performance of the learners in mathematics subject, henceforth it is observed that the quality of teachers is a major concern and its associated with the quality of teacher’s training programmes run across the state. The teacher’s training instates need to work out the new strategies for the qualitative improvement of science and mathematics teachers. When the academic performance goes down, it is not only the students and teachers are at fault, but, the Teachers’ Training Institutes are also equally responsible and these institutes need to understand their responsibilities on the state of Arunachal Pradesh.

REFERENCES