

# Influence of Intelligence and Attitude in Academic Achievement of students in Mathematics at Elementary School Stage in Arunachal Pradesh-A Critical Study



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## Abstract

The aim of present study was to find out the influences of intelligence of learners and attitude of teachers and learners on performance in mathematics at elementary school stage in Arunachal Pradesh. The study was conducted over a sample of 1910 students of Class - VII of five districts (Tawang, Papumpare, Lower Subansiri, East Siang and Lower Dibang Valley) of the state and 50 teachers teaching at elementary schools. Academic Achievement test for 7<sup>th</sup> grade learners, Attitude scale for teachers and students towards teaching- learning process of mathematics and Group intelligence test for learners were used to collect the data for this purpose. It was found that the performance of 7<sup>th</sup> grade learners in mathematics was extremely poor; attitude of teachers was favourable towards teaching – learning process of mathematics. The attitude of girls was found more positive towards learning of mathematics than their boys counterparts. Intelligence has greater impact on the performance of learners in mathematics. Also high level intelligence has positive relationship with the performance of learners in mathematics.

**Keywords:** Performance of Learners, Intelligence, Attitude of Teachers and Learners, Elementary School Stage.

## Introduction

Mathematics is the mother of all sciences and has greater impact on our daily life. Hard labour is the key for better performance in mathematics by making regular practices along with understanding of the concepts. There are many factors like attitude of students, home environment, family size, poverty, professionalism of teachers, attitude of teachers, school resources, intelligence level of learners etc. that influence the academic performance of learners at different levels. The attitude of learners as well as the teachers plays a very significant role in the performance in mathematics at elementary school stage. Besides that intelligence has larger impact on it. Present study has been carried out taking a few factors like attitude of teachers & learners and intelligence of learners to know its impact on the performance of learners in mathematics at elementary school stage in Arunachal Pradesh.

## Review of Literature

Rajut, A.S. (1984), Some, P. (1984) Mehtotra (1986), Mishra (1986), Kapoor (1987), Ray (1992), Chaturvedi (1992), Srivastava (1993), Thampumurthy (1994), Wangsu (1995), panda (1996), Trivedi (2012), Habibollah, N et al (2009), Das (2012), carried out the studies on performance of learners in mathematics and their relationship with attitude and intelligence at different levels of students and all of them agreed upon that the attitude of teachers and students and intelligence of students has more influence on their academic performance in mathematics.. In Arunachal Pradesh a few studies like Kapoor and Sinha (2010), Kapoor and Lhungdim (2014) etc have been carried out so far related to the performance of learners in mathematics taking sex, caste and settlement variables. Thus, the researcher has tried to find out the relationship between the performance of learners of five districts (Tawang, Papumpare, Lower Subansiri, East Siang and Lower Dibang Valley) in mathematics with the attitude of teachers, attitude of learners and their intelligence.

**Objectives of the Study**

1. To assess the status of academic performance of 7<sup>th</sup> grade learners in Mathematics in five districts of Arunachal Pradesh (2017-18).
2. To study the influence of intelligence on academic performance in mathematics of 7<sup>th</sup> grade learners of Arunachal Pradesh.
3. To study the attitude of teachers and students at elementary school stage towards teaching and learning of mathematics in Arunachal Pradesh.

**Hypotheses**

1. There is no significant difference between the performance in mathematics mean scores of 7<sup>th</sup> grade learners of high intelligence and low intelligence of five districts of Arunachal Pradesh
2. There is no significant difference between the attitude mean scores of male and female mathematics teachers towards teaching -learning process in mathematics at elementary school stage in five districts of Arunachal Pradesh.
3. There is no significant difference between the attitude mean scores of boys and girl 7<sup>th</sup> grade learners in learning of mathematics at elementary school stage in five districts of Arunachal Pradesh.

**Methodology**

1. In the present research 'Descriptive cum Normative Survey' method has been used.
2. Population of study was 7<sup>th</sup> grade learners from five districts of Arunachal Pradesh. During the session 2017-18. There were 4206 (boys-1860

and girls -2346) students studying in class-VII (Source: UDISE-2017-18).

3. The sample of the study was 1910 ( boys-878 and girls- 1032) approximately 45% of students studying in class-VII of five districts viz Papumpare, Lower Subansiri, Tawang, , East Siang, and Lower Dibang Valley districts of Arunachal Pradesh. 50 teachers teaching at upper primary level from these districts were taken as sample. The sample was selected by stratified random sampling method in which 66 schools from five districts were selected.
4. Attitude scale (Likert Type) for teachers and students were developed and standardized by the investigator. Standardized Group Intelligence Test developed by Dr.( Mrs.) Pramila Ahuja was procured from National Psychological Corporation, Agra and were administered on selected samples for collection of data. Inferential statistical techniques like mean, standard deviation and t-test were used for analysis of data.

**Major Findings of the study**

After the evaluation of administered papers, the scores were organized and tabulated for objective wise analysis and interpretation of data.

**Objective: 1: To assess the status of academic performance of 7<sup>th</sup> grade learners in mathematics of Arunachal Pradesh (2017-18)**

For achieving this objective, following table has been used:

**Table No – 1: Showing the performance mean score in mathematics and standard deviation of Govt Schools of five districts of Arunachal Pradesh**

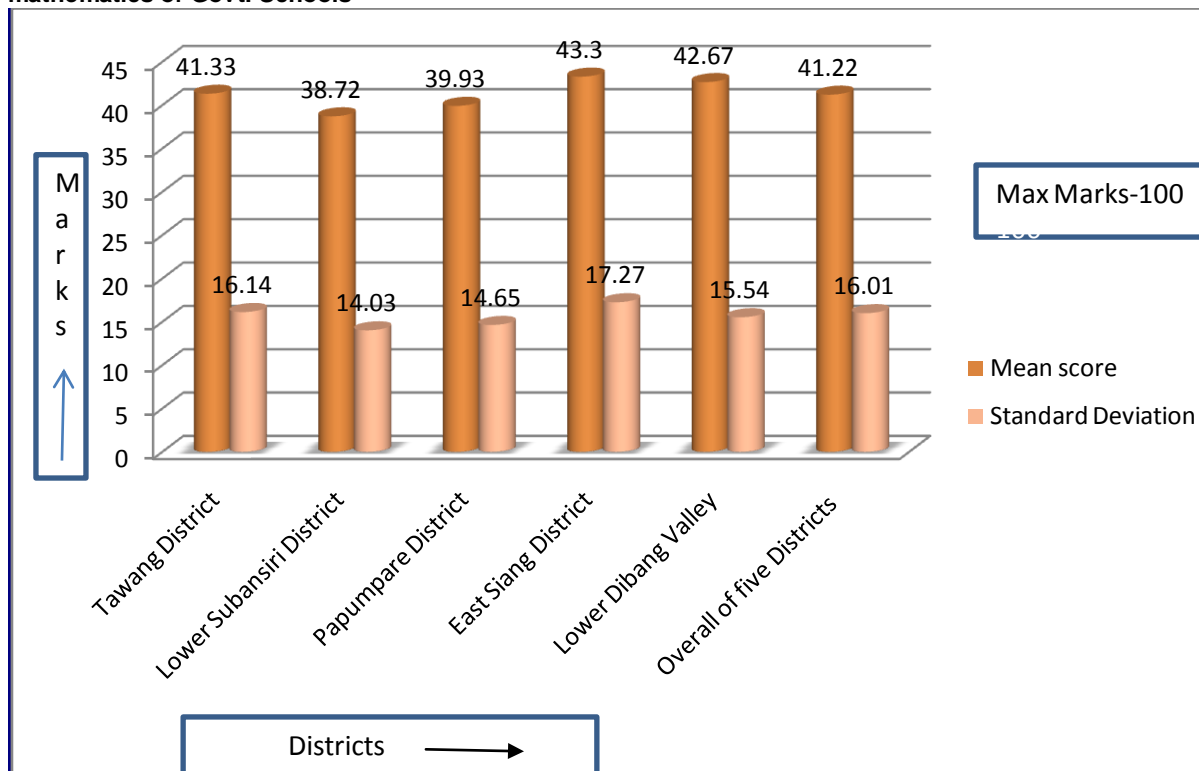
SI No	Name of districts	Mean score	Standard Deviation	Coefficient of Variation $(\frac{\sigma}{x} \times 100)$
1	Tawang District	41.33	16.14	39.05154
2	Lower Subansiri District	38.72	14.03	36.2345
3	Papumpare District	39.93	14.65	36.68921
4	East Siang District	43.30	17.27	39.88453
5	Lower Dibang Valley	42.67	15.54	36.41903
6	Overall of five Districts	41.22	16.01	38.84037

**Interpretation**

From table No-1, it is obvious that mean score of performance of learners in mathematics in all five districts are below average marks (50) of Achievement test. It signifies that learners of all the districts are extremely poor. The performance in mathematics of 2 districts is below the average and remaining three districts is found to be slightly above the mean score of all the districts or at par with it.. But

most important fact the standard deviation of all the districts are very high and a matter of serious concern. Coefficient of variation is also high which shows low consistency in the result. The above information is represented by Bar diagram for better perception of performance in mathematics at Elementary school stage in five districts of Arunachal Pradesh

Figure -1 Double Bar graph showing the mean scores and standard deviation of performance of learners in mathematics of Govt. Schools



**Objective – 2**

To study the influence of intelligence on academic performance of 7<sup>th</sup> grade learners in mathematics of Arunachal Pradesh (2017-18).

**Hypothesis-1**

There is no significant difference between the performance mean scores of 7<sup>th</sup> grade learners in mathematics of high intelligence and low intelligence level.

Table No– 2: Showing the comparison between the Performance of 7<sup>th</sup> grade learners in mathematics of five districts by intelligence level (2017-18)

Group of Teachers	No of learners	Mean score	Standard Deviation	t- value	Remarks
Low Intelligence	661	37.36	12.85	9.81	Significant
High Intelligence	595	45.41	15.87		

Source : Field Work ( 2017-18)

**Interpretation**

Above table no-2 shows that the computed t-value is found to be 9.81 which is greater than the criterion t-value (2.58) at 0.01 level of confidence for 1254 df. Therefore the computed t-value ( 3.93) has been found significant and the formulated hypothesis: *There is no significant difference between the performance mean scores of 7<sup>th</sup> grade learners in mathematics of high intelligence level and low intelligence level* got rejected. It is interpreted that the performances of 7<sup>th</sup> grade learners of high intelligence and low intelligence differ significantly in their performance in mathematics. Also It is found that the mean score (45.41) of 7<sup>th</sup> grade learners of high intelligence is greater than the mean score (37.36) of learners of low intelligence. Thus the performance of learners of high intelligence is better than performance of learners having low intelligence in

learning of mathematics at elementary school stage of five districts of Arunachal Pradesh.

**Objective 3**

To study the attitude of teachers and students of elementary school stage towards teaching and learning of mathematics in Arunachal Pradesh.

**Objectives: 3.01**

To investigate the difference between attitude mean scores of male and female mathematics teachers towards teaching and learning of mathematics at elementary school stage in five districts of Arunachal Pradesh (2017-18)

**Hypothesis -2**

There is no significant difference between the attitude mean scores of male and female mathematics teachers towards teaching- learning process of mathematics at elementary school stage in five districts .

**Table No- 3: Summary of Mean Scores, SD and t-value of attitude mean scores of male and female mathematics teachers working at elementary school stage in five districts.**

Group of Teachers	No of teachers	Mean score	Standard Deviation	t- value	Remarks
Male	34	55.5	7.2	0.86	Not significant
Female	16	57.38	7.26		

Source : Field Work ( 2017-18).

**Interpretation**

It is obvious from table no-3 that the computed t-value is 0.86 which is less than the criterion t-value (2.01) at .05 level of confidence for 48 df. As the computed t-value (0.86) is not significant at 0.05 level of confidence for 48 df, therefore, the formulated hypothesis: *There is no significant difference between the attitude mean scores of male and female mathematics teachers towards teaching and learning mathematics at elementary school stage in five districts of Arunachal Pradesh* is retained. It refers that the male and female mathematics teachers have the equal attitude towards teaching and learning of mathematics at elementary school stage in the selected sample of districts of Arunachal Pradesh. But, the attitude mean scores of male teachers (55.5) and female teachers (57.38) have been found higher

than the mean score (40) of the attitude scale. It means both male and female teachers have high attitude towards teaching- learning of mathematics at elementary school stage.

**Objective – 3.02**

To investigate the difference between attitude mean scores of boys and girls 7<sup>th</sup> grade learners towards learning of mathematics at elementary school stage in five districts of Arunachal Pradesh (2017-18).

**Hypothesis -3**

There is no significant difference between the attitude mean scores of boys and girls 7<sup>th</sup> grade learners towards learning of mathematics at elementary school stage in five districts.

**Table No-4 : Showing the mean scores, standard deviation and t-value of attitude scores of boys and girls 7<sup>th</sup> grade learners of elementary school stage in five districts**

Group of learners	No of learners	Mean score	Standard deviation	t- value	Remarks
Boys	890	39.34	8.58	3.34	Significant
Girls	1020	40.69	9.07		

Source: Field Work (2017-18)

**Interpretation**

From above table no -4, it is found that the computed t-value is 3.34 which is greater than the criterion t-value (1.96 ) at 0.05 level of confidence for 1908 df. As the computed t-value (3.34 ) is significant at 0.05 level of confidence for 1908 df, therefore, the formulated hypothesis: *There is no significant difference between the attitude mean scores of boys and girls 7<sup>th</sup> grade learners towards learning of mathematics at elementary school stage in five districts of Arunachal Pradesh* is rejected and it refers that the attitude of boys and girl 7<sup>th</sup> grade learners differ significantly towards learning of mathematics at elementary school stage in the selected sample of districts . It is found that the attitude mean score (40.69) of girls 7<sup>th</sup> grade learners is slightly greater than mean score (39.34) of boys 7<sup>th</sup> grade learners, it implies that girls 7<sup>th</sup> grade learners have slightly more positive attitude towards learning of mathematics than that of their boy counterparts at elementary school stage in Arunachal Pradesh.

**Discussion of the result**

After analysis of the data, it was found that performance of 7<sup>th</sup> grade learners in mathematics during the session 2017-18 was found to be extremely poor. Also the performance of learners of high intelligence was significantly better than performance of learners having low intelligence which is also supported by the studies conducted by Dixit( 1984) and Rajput (1994) .The male and female mathematics teachers have the equal attitude towards teaching -

learning process of mathematics at elementary school stage in five districts of Arunachal Pradesh. They need more support for improvement in performance in mathematics like TLM and academic environment in the school, support from authority etc. The attitude of boys and girls are slightly different towards learning of mathematics and the girl 7<sup>th</sup> grade learners showed slightly more positive attitude towards learning of mathematics than that of their boy counterparts at elementary school stage in Arunachal Pradesh

**Conclusion**

On the basis of above findings, it can be said that the performance of 7<sup>th</sup> grade learners in mathematics of high intelligence is better than the learner having low intelligence. It is because of better understanding of concepts and contents. High intelligence provides better thinking and reasoning ability among learners. Further the attitude of male and female mathematics teachers have positive attitude towards teaching of mathematics at elementary school stage in Arunachal Pradesh and above average than the mean score of attitude scale which signifies that teachers possess favourable attitudes in the subject. It is also found the 7<sup>th</sup> grade girls have higher positive attitude towards learning of mathematics than that of their boy counterparts at elementary school stage in Arunachal Pradesh still the performance in mathematics are poor of both categories of learners. It can be concluded that there are some other factors which has larger impact on

performance in mathematics at elementary school stage and it should be traced out, so that it should be addressed early before it is too late.

#### **Educational implications**

1. The performance of the 7<sup>th</sup> grade learners in Govt Schools of five districts Arunachal Pradesh is alarming. So the Educational planners, the Administration and the practitioners are to put more efforts for improvement.
2. Teachers use to adopt traditional methods of teaching and remain active in classroom but learners are passive. So teachers are to be trained to adopt the new approaches of teaching mathematics like – Constructivistic Approach and Learners Centered Approach as per the need of curriculum for improvement.

#### **Suggestions**

1. Teachers should be suggested to give ample opportunities to the learners to interact with teachers and make more practice in mathematics.
2. If possible, practice works should be done in class room itself so that learners can get clarified their doubts immediately.
3. Adequate number of teaching – learning materials should be provided for elementary school learners to learn through concrete materials at elementary school stage.
4. State specific curriculum should be developed in mathematics taking basic consideration of NCF 2005 to make mathematics more enjoyable for learners.

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