REASONING ABILITY AND IT'S IMPACT THERE OF AMONG THE SECONDARY BOY STUDENTS: AN EXPLORATION IN MATHEMATICAL ACHIEVEMENTS.

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ABSTRACT: Mathematics always plays vital role in academic achievements. Mathematics uphold a central stage while the other subject of science has a close relation with the same, which correlates with numbers, arrangement, quantity, logic of shape along with action research. The present study has emphasized on the effect of reasoning ability on achievements of mathematics of boy students of secondary level. 400 samples have been taken from four high school of class ix and class x of age 14 years to 17 years. These samples were collected from the schools ofblockHabra II of North 24 Parganas District and block Haringhata of Nadia district. For collecting data, stratified random sampling method has been used. Mean, Standard deviation and Pearson coefficient of correlation were followed for calculating data. The result shows that reasoning ability has positive impact on achievement in mathematic of boy students of secondary level of education.

Key words: Reasoning, Mathematics, Reasoning ability, Achievement.

1.INTRODUCTION:

Mathematics is an integral part of cultural heritage of civilized people. It helps students for importance of abstract thinking and reasoning ability. It also develops student numeracy and problem solving skills. We apply mathematics in every field of life and in the work place. It is a compulsory subject of secondary stage of school curriculum. Science and technology cannot progress without mathematics.

Reasoning ability is the most essential part to develop of students in mathematics. The reasoning consists of finding patterns, making predictions, mathematical arguments, evaluating conjecture etc. There are different types of reasoning ability. These are deductive , inductive , abductive, logical, cause and effect, critical thinking, decomposition reasoning.

.2. REVIEW OF THE LITERATURE:

Johnson and Lawson(1998) studied the efforts of reasoning ability prior knowledge on biology achievement on expository and inquiry class. The studywasrevealed that reasoning ability effects an academic achievement in various school subjects.

Ruseffendi(2006) revealed that mathematical reasoning and cognitive abilities are very related.   Cognitive activities help anyone to solve different types of problem.

Wahyudin(2008)studied on the topic of complementary to improve the competencies of pedagogical teachers and professional prospective teachers. It was revealed that mathematics makes a major role for the process of mathematical problem solving.

Gupta(2012) studied of reasoning ability among high school students of Jammu district in relation to sex and academic achievement. It was revealed that there is no significance gender difference in reasoning ability.

Rafique, Syahputraand Surya(2015) studied the influence of reasoning ability to the students. It was revealed that reasoning ability is made major role to develop mathematical ability. It improves the logical thinking, mastering, concept correctly and drawing conclusion.

Alshamali and Dahar (2016) described in his thesis on the topic of the research which was based on the relationship of the scientific reasoning and problem solving ability of upper primary stage of science teacher. The study was revealed that there was a lot of relationship with scientific reasoning and problem solving to develop the professional development of upper primary teacher

Cain and Ralph(2016) studied the relationship of verbal reasoning and numerical ability about the achievement of first year algebra. The study was revealed that there is a positive correlation of its ability about the achievement of first year algebra.

3.OBJECTIVE:

i) To study the impact of Reasoning ability skills of boy students of secondary stage of education.
ii) To study the achievement of mathematics of boy students of secondary stage of education.
iii) To find out the impact of reasoning ability skills on mathematical achievement of secondary stage of education.

4. HYPOTHESES OF STUDY:

i) Whether there is any significant difference of relationship between reasoning ability and achievement in mathematics of boy students of secondary level of education is followed.
ii) Whether there is any significance impact of Reasoning ability of achievement through mathematics of boy students of secondary level of education is followed.

5. SAMPLE OF THE STUDY:

The sample consisted of 400 boy students from class ix and x of secondary schools of North 24 Parganas and Nadia districts in West Bengal.

6. TOOLS OF THE STUDY:

For collection of data, two tools were used
i)The 'Reasoning ability test' prepared and standardized by Maharaj Ahmed Bhat &PunitaGovil (2015).
ii) The 'Mathematics Achievement text' prepared and standardized by L. N. Dubey(2009).

7. DATA COLLECTION:

For collection of data, researcher had to go four different schools of North 24 Parganas and Nadia district.

8. RESULTS AND ANALYSIS.

### A) FOR BOY STUDENTS OF NORTH 24 PARGANAS
a) FREQUENCY ACHIEVEMENT OF BOY STUDENTS OF THE STUDIED SCHOOL
TABLE 1

Parameter	Categories of achievement							
	A		B		C		D	
	Total	**%**	Total	%	Total	%	Total	%
Reasoning ability	21	10.5	48	24	61	30.5	70	35
Mathematical achievement	21	10.5	61	30.5	60	30	68	34

A MEANS 80%-100% MARKS, B MEANS 60% -79%, C MEANS 40% -59%, D MEANS BELOW 40%

200 boy students have been selected of class ix and class x of different schools in North 24 Parganas district. Two sets of questions paper of Reasoning ability test, Mathematics achievement test have been given to these students of class ix and x in different school. From the table, A indicates 80% - 100% marks, B indicates 60% -79% marks, C indicates 40% - 59% marks, D indicates below 40% marks. Here total no of parameters is2. 200 students have answered the two sets of questions of Reasoning ability tests and Mathematics achievement test. For reasoning ability test, 21 students have scored A category marks, 48 students have scored B category marks, 61 students haveC category marks and 70 students have scored D category marks. For Mathematics achievement test, 21 students have scored A category marks, 51 students have scored B category marks, 30 students have scored C category marks, and 68 students have scored D category marks.

Figure.1. Frequency achievement of studied students
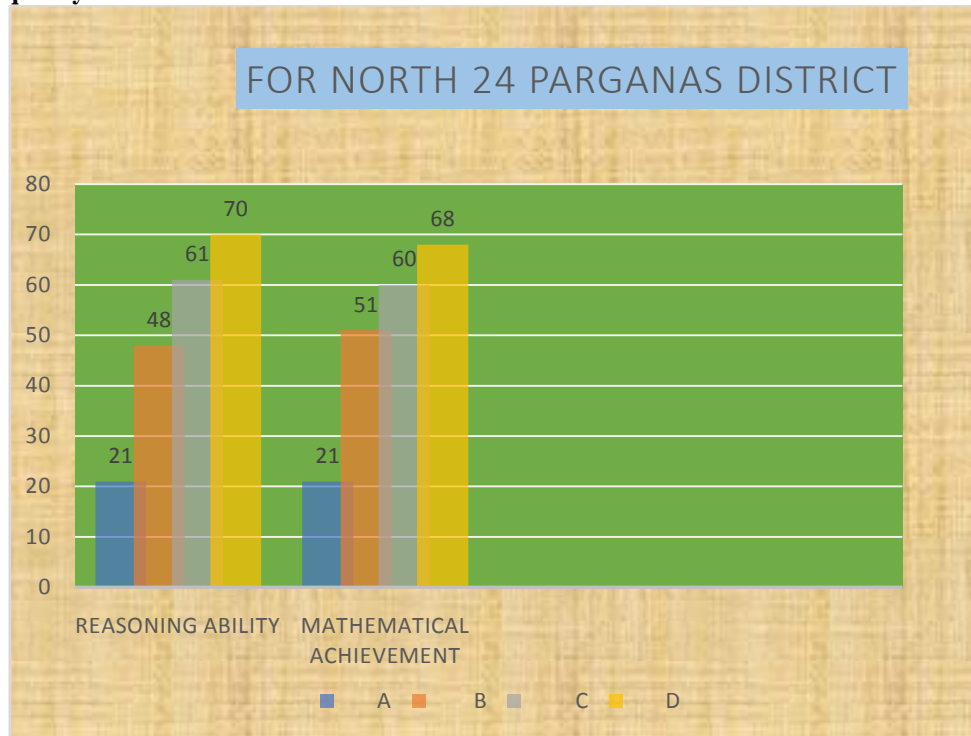
b)CO-RRELATION COEFFICIENT OF REASONING ABILIY AND MATHEMATICS ACHIEVEMENT
TABLE 2

Categories	Reasoning Ability(X)	Mathematical Achievement (Y)	X^2	Y^2	XY
A	21	21	441	411	441
B	48	51	2304	2601	2448
C	61	60	3721	3600	3660
D	70	68	4900	4624	4760
$\sum$	$\sum X=200$	$\sum Y=200$	$\sum X^2=11366$	$\sum Y^2=11236$	$\sum XY=11309$

We know $r_{XY} = (N.\sum XY - \sum X.\sum Y) / \sqrt{(N.\sum X^2 -(\sum X)^2)}.\sqrt{(N\sum Y^2 -(\sum Y)^2)}$

here N=4, $\sum X=200$, $\sum Y=200$, $\sum X^2$ =11366, $\sum Y^2$ =11236, $\sum XY=11850$

Putting these values we get, $r_{XY} = 0.991$

The value of correlation is very high. Therefore, the correlation between two variables is very strong and positive. A student who has high mathematics achievement, has also high reasoning ability and vice versa.

B) FOR NADIA DISTRICT

a) FREQUENCY ACHIEVEMENT OF MALE STUDENTS STUDIED SCHOOL
TABLE 3

Parameter	Categories achievement							
	A		B		C		D	
	Total	**%**	Total	%	Total	%	Total	%
Reasoning ability	19	9.5	47	23.5	47	23.5	87	43.5
Mathematics achievement	21	10.5	48	24	52	26	79	39.5

A MEANS 80%-100% MARKS, B MEANS 60% -79% MARKS, C MEANS 40% -59% MARKS, D MEANS BELOW 40% MARKS.

200 boy students have been selected of class ix and class x of different schools coeducational and boy school in Nadia district. Two sets of questions paper of Reasoning ability test and Mathematics achievement test have been given to these students of class ix and x in different school. From the table, A indicates 80% - 100% marks, B indicates 60% - 79% marks, C indicates 40% - 59% marks, D indicates below 40% marks. Here total no of parameters is 2. 200 students have answered the two sets of questions of Reasoning ability tests and Mathematics achievement test. For reasoning achievement test, 19 students have scored A category marks, 47 students have scored B category marks, 47 students have C category marks and 87 students has scored D category marks. For Mathematics achievement test, 21 students have scored A category marks, 48 students have scored B category marks, 52 students have scored category marks, and 79 students have scored D category marks.

Figure.2. Frequency achievement of studied students
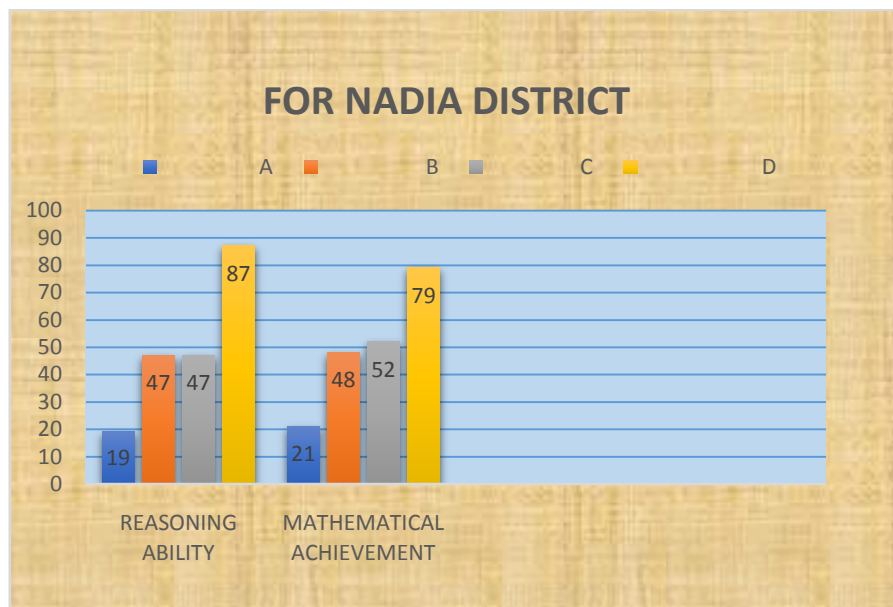
b) THE CORRELATION COEFFICIENT OF REASONING ABLITY AND MATHEMATICAL ABILIY

TABLE 4

Categories	Reasoning Ability(X)	Mathematical Achievement (Y)	X^2	Y^2	XY
A	19	21	361	441	399
B	47	48	2209	2304	2256
C	47	52	2209	2704	2444
D	87	79	7569	6241	6873
$\sum$	$\sum X=200$	$\sum Y=200$	$\sum X^2=12348$	$\sum Y^2=11690$	$\sum XY=11761$

We know

$$r_{XY} = (N\sum XY - \sum X.\sum Y) / \sqrt{(N\sum X^2 -(\sum X)^2)}.\sqrt{(N\sum Y^2 -(\sum Y)^2)}$$

here N=4, $\sum X=200$, $\sum Y=200$, $\sum X^2=12348$, $\sum Y^2=11690$, $\sum XY=11761$

Putting these values we get

$r_{XY} = 0.884$

The correlation coefficient is high. Both are highly correlated. The boy student who has high reasoning ability has good Mathematical ability and vice versa.

9. DISCUSSION

As a result to this research of above two correlation coefficient from North 24 Parganas district and Nadia district,the correlation coefficient between reasoning ability and mathematicalachievement is very high. Theboy student who are very strong in reasoning ability skills, are also strong in mathematical ability. For development of subject of

mathematics, every student should develop of reasoning ability skills. Good performance of mathematics is very necessary for development of other subject of science and also for technology.

Finding by the analysis of correlation coefficient, it shows that

> i)There is no significance difference of reasoning ability and achievement of mathematics of boy students of secondary level of education.
>
> ii) There is a high impact of reasoning ability on achievement in mathematics of boy students of secondary level of education.

10.CONCLUSION

The result of data analysis, it is found thatthereasoning ability and achievement in mathematics are very correlated.If the reasoning abilityofa student is poor then the mathematical ability of the student is also poor.

Hence the research discovers that the reasoning ability has a positive impact to achievement in mathematics of the boy students of secondary levelof education.

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