



## MATHEMATICS ACHIEVEMENT AND PARENTAL ENCOURAGEMENT OF SECONDARY LEVEL STUDENTS

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### Abstract

The present study was conducted to know Mathematics achievement and parental encouragement among secondary level students. A sample of 600 Class IX students (312 boys and 288 girls) from state government secondary schools in the Katihar district of Bihar, were selected through the cluster sampling technique. Data were collected using the parental encouragement scale by Sharma and a self-constructed Mathematics Achievement Test. Data were analysed using mean, SD, t-test, and product-moment correlation. The findings of the study revealed that majority of the secondary level students possess average level of mathematics achievement while majority of the secondary level students reported low level of parental encouragement. There is a significant difference in mathematics achievement and parental encouragement among male and female secondary level students. Male students possess higher mathematics achievement than female students while Male students received higher parental encouragement than female students. A significant positive correlation was found between mathematics achievement and parental encouragement.

**Keywords:** Mathematics achievement, Parental encouragement, Secondary Level students

### INTRODUCTION

Secondary education works as a vital bridge between upper primary education and higher education. It is the important phase of education when students enter the adolescent period of their lives, which is often the most energetic, active, and emotional phase of any child's life. During this age, proper guidance for students becomes extremely crucial. Education is a lifelong process, which means that a person continues to learn throughout their whole life, and that learning never ends. To ensure students' overall development, we must channel their high energy and natural activeness in positive and constructive directions. Students should be constantly motivated to do their best in the skills and subjects they are proficient at. Today secondary education is not just about passing the exams or rote learning or memorising the contents of the text books. It is about making the students think in a critical and logical manner

and solve the problems of daily life in a smart way. Subjects like mathematics are more advanced, and students may perceive them as abstract at this level.

Mathematics is important theoretically, but it is also used in real life situations such as handling money, measuring, and making simple decisions. James (2006) explained that learning mathematics helps students develop logical thinking and reasoning, solve problems, and apply these skills in everyday life and in other areas of study. Because of this, power performance in mathematics can negative affect other achievement of student. Mathematical puzzles and games are helpful to develop interest towards mathematics learning of students. Regular communication between parents and teachers can further help identify learning difficulties and provide appropriate support. Therefore, active parental involvement, combined with effective teaching practices, can significantly improve interest, confidence in mathematics among secondary level students.

Parental encouragement at the secondary level can create a positive attitude towards learning and enhance academic achievement. When parents show interest in a child's studies, the child feels that learning matters. A student whose parents ask about school, praise their efforts, and discuss future plans is more likely to view studying as worthwhile rather than future plans. Encouragement also builds confidence. Encouragement from parents can help children respond constructively to mistakes, encouraging them to be persistent and it will help to develop a positive attitude toward learning. Providing suitable environment to the child is one of the important steps in the parental encouragement. Parents should motivate their child to regular practice of mathematics.

Balakrishnan (2025) compared parental encouragement in respect to gender and found significant difference of parental encouragement of male and female students. The results also revealed that male students reported more parental encouragement than female students. Fayaz (2023) examined the average mean value of parental encouragement between boys and girls adolescents. The study's findings revealed a significant difference in the mean value of parental encouragement between boys and girls and boys. Boys have more parental encouragement than girls. Garg (2015) studied how parental encouragement affects the emotional well-being of students in higher secondary schools. The study's findings indicate that boys have slightly higher parental encouragement than girls, although there is no significant difference in the mean parental encouragement. Yadav and Singh (2018) studied mathematics achievement among secondary school student and found a significant difference between Mathematics Achievements of High and Low Anxiety Students. Kaur (2016) conducted study to compare the mathematics achievement of class 9<sup>th</sup> students under 5 different dimensions of attitude towards learning and found significant difference in mathematics achievement under all the 5 dimensions of attitude towards learning. Reddy and Kavitha (2025) examined the achievement in mathematics of secondary school students with reference to gender. The study's findings show a significant difference in mathematics achievement between boys and girls. Girls secondary school students have higher academic achievement than boys students.

## **OBJECTIVES OF THE STUDY**

For the present study, the following objectives were framed:

1. To assess the level of mathematics achievement among secondary level students.
2. To assess the level of parental encouragement among secondary level students.

3. To compare the mathematics achievement between male and female secondary level students.
4. To compare the parental encouragement between male and female secondary level students.
5. To find out the correlation between parental encouragement and mathematics achievement among secondary level students.

### **HYPOTHESES OF THE STUDY**

The following hypotheses were formulated from the objectives of the present study:

1.  $H_0$  : There is no significant difference in the mathematics achievement between male and female secondary level students.
2.  $H_0$  : There is no significant difference in the parental encouragement between male and female secondary level student.
3.  $H_0$  : There is no significant correlation between parental encouragement and mathematics achievement among secondary level students.

### **METHOD**

The study was conducted using the descriptive survey method.

### **SAMPLE AND SAMPLING TECHNIQUE**

A sample of 600 Class IX students (312 boys and 288 girls) from the state government secondary schools in the Katihar district of Bihar selected through the cluster sampling technique.

### **TOOLS USED**

To measure the Parental encouragement of secondary level students, Parental encouragement scale by Sharma was used. A self-constructed Mathematics Achievement Test was used to measure the mathematics achievement of students.

### **STATISTICAL TECHNIQUES USED**

Percentage, mean and SD were used to describe the obtained scores. The t-test was used to compare scores of boys and girls and Pearson's product-moment correlation was used to find the relationship between parental encouragement and mathematics achievement.

### **DATA ANALYSIS AND INTERPRETATION**

**Objective 1:** To assess the level of mathematics achievement among secondary level students

**TABLE -1 Level of Mathematics Achievement Ability among secondary level students**

| <b>Level</b> | <b>Frequency</b> | <b>%</b> |
|--------------|------------------|----------|
| High         | 117              | 19.5     |
| Average      | 374              | 62.3     |
| Low          | 109              | 18.2     |

Table -1 shows the result of the level of mathematics achievement among secondary level students. Finding of the study revealed that 18.2% of secondary level students achieve low level of mathematics achievement, 62.3% moderate level of mathematics achievement and 19.5% high level of mathematics achievement.

Hence, we can conclude that majority of secondary level students have moderate level of mathematics achievement.

**Objective 2:** To assess the level of parental encouragement among secondary level students

**TABLE -2 Levels of Parental Encouragement Among Secondary School Students**

| Level   | Frequency | %     |
|---------|-----------|-------|
| High    | 26        | 4.33  |
| Average | 214       | 35.67 |
| Low     | 360       | 60    |

Table -2 shows the level of Parental encouragement among secondary level students. The data reveals that 60% of the secondary level students demonstrated low level of parental encouragement, 35.67% average level of parental encouragement and 4.33% are high level of parental encouragement.

Hence, we can conclude that majority of secondary level students have low level of parental encouragement.

**Objective 3:** To compare the mathematics achievement between male and female secondary level students.

**H<sub>0</sub> :** There is no significant difference in the mathematics achievement between male and female secondary level students .

**TABLE- 3 Comparison of Mathematics Achievement between Male and Female Secondary Level Students**

| Group  | N   | Mean  | SD   | df  | Calculated t-value | Tabulated t-value | Level of significance     |
|--------|-----|-------|------|-----|--------------------|-------------------|---------------------------|
| Male   | 312 | 26.15 | 8.74 | 598 | 4.13               | 1.96              | Significant at 0.05 level |
| Female | 288 | 23.32 | 8.06 |     |                    |                   |                           |

Table-3 shows the findings of the mathematics achievement of secondary level students related to the comparison of mathematics achievement among male and female secondary level students. From the table, it is clear that obtain t-value mathematics achievement between two groups male and female secondary level students is  $4.13 >$  tabulated t-value, which is significant at 0.05 level. Hence, hypothesis “*There is no significant difference in the mathematics achievement between male and female secondary level students*” is rejected. Therefore, we can say that there is a significant difference in the mathematics achievement among Male and Female Students.

**Objective 4:** To compare the parental encouragement between male and female secondary level students.

**H<sub>0</sub>:** There is no significant difference in the parental encouragement between male and female secondary level students.

**TABLE- 4 Comparison of Parental Encouragement Between Male And Female Secondary Level Students**

| Group  | N   | Mean  | SD   | df  | Calculated t-value | Tabulated t-value | Level of significance     |
|--------|-----|-------|------|-----|--------------------|-------------------|---------------------------|
| Male   | 312 | 60.65 | 6.25 | 598 | 4.57*              | 1.96              | Significant at 0.05 level |
| Female | 288 | 58.40 | 5.81 |     |                    |                   |                           |

Table-4 shows the comparison of Parental encouragement and mathematics achievement of male and female secondary level students. From the table obtain t-value

between the Parental encouragement of male and female students is  $3.28 >$  tabulated t-value which is significant at 0.05 level. Hence, hypothesis “*There is no significant difference in the parental encouragement between male and female secondary level students*” is rejected. Therefore, we can conclude that there is a significant difference in the parental encouragement among Male and Female Students.

**Objective 5:** To find out correlation between parental encouragement and mathematics achievement among students

**Hypothesis  $H_0$  :** There is no significant correlation between parental encouragement and mathematics achievement among students

**TABLE -5 Correlation between Parental Encouragement and Mathematics Achievement**

|                         | Parental encouragement | Mathematics Achievement |
|-------------------------|------------------------|-------------------------|
| Parental Encouragement  | 1                      | 0.447*                  |
| Mathematics Achievement | 0.4478                 | 1                       |

**Significant at 0.05 level\***

Table-5 Shows correlation between Parental encouragement and mathematics achievement from the table. Result of the study shows that correlation between Parental encouragement and mathematics achievement is 0.447 which is significant at 0.05 level. Hence, hypothesis “*There is no significant correlation between parental encouragement and mathematics achievement among secondary level students*” is rejected. Therefore, it can be concluded that there is a significant correlation between Parental encouragement and mathematics achievement.

## FINDINGS OF THE STUDY

The following findings were inferred from the statistical analysis:

1. Majority of the secondary level students demonstrated average level of mathematics achievement.
2. Majority of the secondary level students showed low level of parental encouragement.
3. There is a significant difference in mathematics achievement between secondary level male and female students. Male students possess higher mathematics achievement than female students.
4. There is a significant difference in the Parental encouragement among secondary level male and female students . Male students possess higher Parental encouragement than female students.
5. There is a significant positive correlation between mathematics achievement and parental encouragement among secondary level students. Those with strong parental encouragement tends to performed better in mathematics, while those with lower parental encouragement achieved lower scores in mathematics.

**Educational Implications:** The findings of the study revealed that a majority of the students received a low level of parental encouragement and that boys reported a higher level of parental encouragement than girls. These findings highlight the important role of parents in creating a supportive home environment that promotes students’ academic achievement in mathematics as well as in other subjects. The following educational implications may be considered in light of the findings of the present study.

The findings of the present study indicate that most secondary level students received a low level of parental encouragement, and that boys reported higher parental encouragement than girls. The extent to which a child is encouraged to achieve in mathematics, as well as in other subjects, depends largely on the attitude and efforts of the parents. Parents are therefore advised to take an active interest in the child's daily learning by asking what was taught in mathematics and which topics were found difficult. Parents who are unable to solve mathematical problems themselves can still ask the child to explain a solution, since attentive listening signals that the child's work is valued. A weekly look through the mathematics notebook, without focusing only on errors, conveys the same message. When a child performs poorly in a test, parents should help the child to understand that mistakes are a natural part of learning mathematics. Praise is most effective when it is specific, for example, "you chose the right method, and only the last step was incorrect." Comparing the child with siblings or neighbouring children tends to discourage the child and should be avoided.

Parents should also provide equal opportunities to sons and daughters. They can hold the same expectations for both, allow both the same protected time for study, and share household responsibilities so that girls are not left with insufficient time for homework. Discussing careers that require mathematics, such as engineering, medicine, and teaching, with daughters can help them see that their studies have value beyond school. Furthermore, a fixed study hour, a quiet and suitable study place, and the necessary notebooks and reference books are within the means of most families. Where space is limited, parents can at least protect the study hour from household chores and noise.

Regular contact with the school is equally important. Parents can meet the mathematics teacher at least once a term to find out which topics the child finds difficult and how they can help at home. Attending parent-teacher meetings, even in the role of a listener, shows the child that the home and the school are working together. Before the stream after the Class X, parents should discuss with the child what each stream leads to and why mathematics matters in it. Expectations should be high enough to challenge the child yet realistic enough to be achieved. A child who knows that parents believe in a goal is more likely to work toward it.

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