

# Attitude Towards Mathematics - A Comparative Study Of School Going Rural And Urban Adolescents Of District Shamli

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## Abstract

Mathematics is a very powerful and important tool for global understanding and communication that organizes our lives and prevents chaos. Math encourages logical reasoning, critical thinking, creative thinking, abstract or spatial thinking, problem-solving ability, and even effective communication skills. Mathematics is having very important place in the school curriculum. The aim of this study was to study the correlation between attitude towards mathematics and location of the school going adolescents of district Shamli. The sample of the research consisted of 400 class 10th students of different rural and urban schools of district Shamli (Uttar Pradesh). As a result of the research, it was determined that attitude towards mathematics was dependent on the location of the adolescent students i.e. rural or urban. The urban adolescents were found to have better attitude towards mathematics than rural adolescents

**Keywords:** Mathematical Attitude, Adolescent, Rural, Urban.

### Introduction

Mathematics is a very powerful and important tool for global understanding and communication that organizes our lives and prevents chaos. It helps us understand the world and provides an effective way of building mental discipline. It encourages logical reasoning, critical thinking, creative thinking, abstract or spatial thinking, problem-solving ability, and even effective communication skills. The origin of the word "mathematics" in Greek, which means tendencies to learn, and there are many branches of mathematics in science, that are related to the numbers, including the geometric forms, algebra, and others.

Mathematics plays a vital role in all aspects of life, whether in everyday matters such as time tracking, driving, cooking, or jobs such as accounting, finance, banking, engineering, and software. Mathematics has no generally accepted definition. There is not even consensus on whether mathematics is an art or a science. Some just say, "Mathematics is what mathematicians do." Aristotle defined mathematics as "the science of quantity" and this definition prevailed until the 18th century. However, Aristotle also noted a focus on quantity alone may not distinguish mathematics from sciences like physics; in his view, abstraction and studying quantity as a property "separable in thought" from real instances set mathematics apart. Haskell Curry defined mathematics simply as "the science of formal systems". The German mathematician Carl Friedrich Gauss referred to mathematics as "the Queen of the Sciences". More recently, Marcus du Sautoy has called mathematics "the Queen of Science- the main driving force behind scientific discovery". The philosopher Karl Popper observed that "most mathematical theories are, like those of physics and biology, hypothetico-deductive".

As a general guideline, the NPE (1986) has two very significant directives and every teacher of mathematics should know their implications in the teaching of mathematics. The NPE states that to promote equality, it will be necessary to provide for equal opportunity to all not only in access but also in the conditions for success. The Kothari Commission Report (1964-66) rightly points out that the study of mathematics plays a prominent part in modern education. It says that one of the outstanding characteristics of

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scientific culture is qualification. Mathematics therefore assumes a prominent position in modern education.

### **Review of Literature**

Following studies relevant to the present investigation have been reviewed.

Howley, C.B. and Gunn, E. (2003) found that mathematics is arguably the most teachable of subjects, determining the comparative status of rural students. Achievement in this subject seems a good test of the presumption. The research showed that available evidence falsifies the presumption.

Sarwar, M. et al (2010) found that attitude and achievement go side by side with each other. If the attitude to study is positive, the achievement is greater, which means that the better the attitude, the better the marks and learning. If the attitude to study is negative, the marks and learning are low; so, the development of a positive attitude to study is essential. The rural students have better attitudes about studying than the urban students. The reasons for the positive attitude to study among rural students are yet to be explored. The achievements of rural and urban students are vital indicators of their attitudes. An interesting curriculum can be very effective in order to activate a positive attitude to study. Moreover, the friendly behaviour of teacher to students can go a long way in connection with the development of a positive attitude.

Davadas S.D., Lay F.Y. (2017) found that with the exclusion of some indicators from the scales, the measurement models showed acceptable reliability and validity. The structural model has moderate predictive relevance but the inter-relationships of the constructs in the structural model were significant. Teacher affective support and classroom instruction predict attitude towards mathematics more than parental influences.

Bora A. and Ahmed S. (2018) tries to investigate the level of secondary school students' attitude towards geometry learning. It is found that attitude level is not satisfactory. Attitude level is highly affected by gender of the students and management type of the schools.

Chaudhary, Q.A. et al (2019) determined that majority of the students have a tendency of negative attitude towards mathematics. Though there are many students who have positive attitude towards mathematics, but they are less in number. It is also evident that male and female students have the same attitude towards learning mathematics. Results depicted that most students think that learning mathematics is a waste of time, it scares them to think that they will be taking advanced high school mathematics, memorization of formulas is the best way to do well in mathematics while male and female did not have different opinion about liking mathematics, most of the students think that they are good at many things, but not good at mathematics. It is also found that when students are taking mathematics tests, they usually feel very nervous and uneasy.

Davadas, S.D. and Lay, Y.F. (2020) concludes that socio economic status and gender were not significantly related to attitude towards mathematics. The comparison of urban and rural students indicated that CI and TAS were strongly related to ATM. Thus, this reinforces the need for learning in the classroom to be fun, interesting and supported affectively by the teacher. PA was also a significant motivator to improve students' ATM. PPI was significantly related to ATM as well. These findings presented the importance of all these constructs: PPI, TAS, CI and PA to ensure positive attitude towards mathematics among the students. Future studies need to investigate more on other factors relating to parental influence by exploring the impact of parents' attitude towards mathematics, and their mathematical efficacy. This might lead to greater insights which can assist in the employment of greater collaboration and partnership with the school, and the implementation of more effective educational strategies in school and at home.

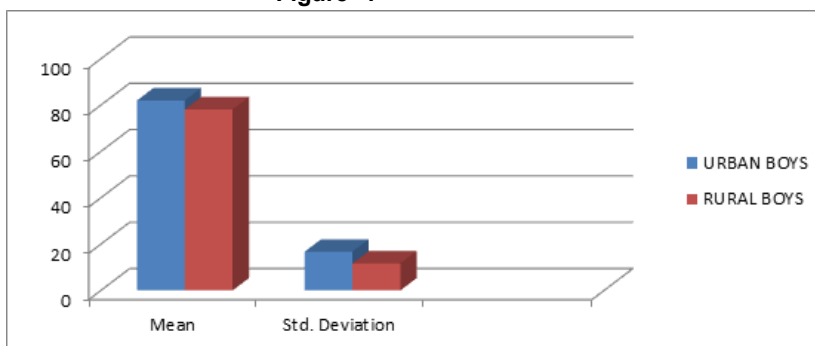
<b>Objective of the Study</b>	Following were the objectives of the study. <ol style="list-style-type: none"> <li>1. To study the attitude of school going rural adolescents towards mathematics.</li> <li>2. To study the attitude of school going urban adolescents towards mathematics.</li> <li>3. To study the significant difference of school going rural and urban adolescents in relation to their attitude towards mathematics.</li> </ol>
<b>Hypothesis</b>	A major null hypothesis was made for testing difference between attitude of rural and urban adolescents towards mathematics. Following Null Hypothesis was tested in the study- H <sub>0</sub> - There is no significant difference between school going rural and urban adolescents in relation to their attitude towards mathematics.
<b>Delimitation</b>	Following were the delimitations of the study <ol style="list-style-type: none"> <li>1. The study was delimited to rural and urban areas of only one district i.e. Shamli (U.P.).</li> <li>2. The study were delimited to 400 school going adolescents.</li> <li>3. The students were selected from various rural schools and urban schools of Shamli district of Uttar Pradesh.</li> <li>4. The study was restricted to only one variable i.e. attitude towards mathematics.</li> </ol>
<b>Methodology</b>	After preparing the conceptual background, the objective, the hypothesis and the delimitations of the study were decided. Broadly, normative survey method was followed. The data pertaining to the attitude towards mathematics of the school going adolescents was determined by using mathematics attitude scale test. Statistical methods like mean, standard deviation and 't-test' were applied to analyze the scores and to find out requisite solutions pertaining to the various objectives delineated for the problem. Finally the data was interpreted and conclusions were drawn.
<b>Population</b>	The school going adolescents of class 10 from different schools of district Shamli of Uttar Pradesh was taken as the population of the study.
<b>Sample of The Study</b>	The sample of the present study was comprised of 400 students in all. Out of these, 200 belonged to the rural area. The rural sample was consisted of 100 girls and 100 boys. Similarly the urban sample was consisted of 100 girls and 100 boys.
<b>Scoring of The Questionnaire</b>	Scientific Attitude Scale can be scored by hand. A positive item weighed of 5 for strongly agree (SA), 4 for agree (A), 3 for undecided (UD), 2 for disagree (D) and 1 for strongly disagree (SD). Similarly a negative item weighed 1 for strongly agree (SA), 2 for agree (A), 3 for undecided (UD), 4 for disagree (D) and 5 for strongly disagree (SD).
<b>Analysis And Interpretation of Data</b>	To investigate the significance of difference between the means, if any, of the mathematical attitude of rural and urban school going adolescents, the variables were assessed in terms of their scores in the Mathematics Attitude Scale Test and the t-test was employed. The analysis of data is presented below..
<b>Significance of the Difference Between the Mean scores of MAS Among Urban and Rural Adolescent Boys</b>	The table showing the Significance of the difference between the mean scores of MAS among urban adolescent boys and rural adolescent boys is given below. Table 1 and figure 1 revealed that the mean scores of Mathematics Attitude Scale test among urban adolescent boys and rural adolescent boys were 81.9680 and 78.1430 and their standard deviation values were 16.70615 and 11.64630 respectively

**Table 1: Table showing the difference of mean scores of Mathematics Attitude Scale Test and their standard deviation among urban and rural adolescent boys**

Groups	N	M	Std. Deviation	Mean Difference $M_1-M_2$	SEd	t-value
Urban Boys	100	81.9680	16.70615	3.8250	1.19774	3.194
Rural Boys	100	78.1430	11.64630			

The calculated value of t-value for the above set of data was 3.194 while the table value for the same data at 0.05 level of significance was 1.980 and at 0.01 level of significance was 2.630. This shows that the t-value was significant at 0.05 level of significance as well as at 0.01 level of significance. It revealed that significant difference exists between mean scores of Mathematics Attitude Scale test among urban and rural adolescent boys. Hence the null hypothesis that "There is no significant difference between school going rural and urban adolescents in relation to their attitude towards mathematics" stands rejected.

**Figure- 1**



**Significance of the difference between the mean scores of MAS among urban and rural adolescent girls**

The table showing the Significance of the difference between the mean scores of MAS among urban adolescent girls and rural adolescent girls is given below. Table 2 and figure 2 revealed that the mean scores of Mathematics Attitude Scale test among urban adolescent girls and rural adolescent girls were 77.6900 and 76.0700 and their standard deviation values were 14.91166 and 14.20361 respectively.

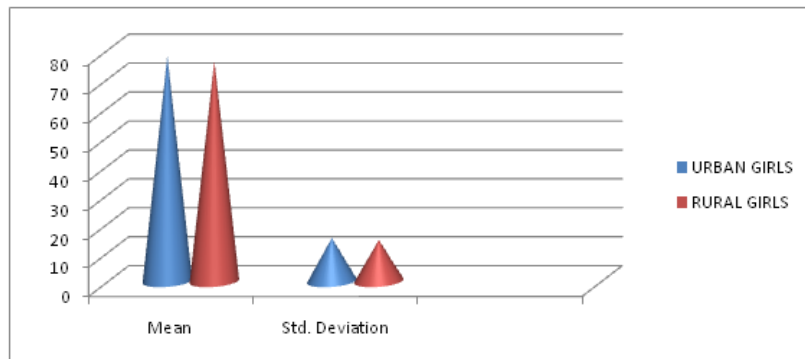
**Table 2: Table Showing The Difference of Mean Scores of Mathematics Attitude Scale Test and Their Standard Deviation Among Urban and Rural Adolescent Girls**

Groups	N	M	Std. Deviation	Mean Difference $M_1-M_2$	SEd	t-value
Urban Girls	100	77.6900	14.91166	1.6200	0.44549	3.636
Rural Girls	100	76.0700	14.20361			

The calculated value of t-value for the above set of data was 3.636 while the table value for the same data at 0.05 level of significance was 1.980 and at 0.01 level of significance was 2.630. This showed that the t-value was significant at 0.05 level of significance as well as at 0.01 level of significance. It revealed that a significant difference exists between mean scores of the Mathematics Attitude Scale test among urban adolescent girls and rural adolescent girls. Hence the null hypothesis that "There is no significant

difference between school going rural and urban adolescents in relation to their attitude towards mathematics” stands rejected. This showed that urban adolescent girls were having better attitude towards mathematics than rural adolescent girls.

**Figure 2:** Graph showing the difference of mean scores of Mathematics Attitude Scale Test and their standard deviation among urban and rural adolescent girls



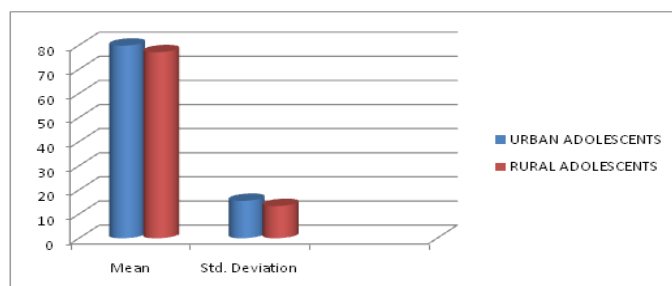
**Significance of the Difference Between the mean Scores of MAS Among Urban and Rural Adolescent Students**

The table showing the Significance of the difference between the mean scores of MAS among urban adolescent students and rural adolescent students is given below. Table 3 and figure 3 revealed that the mean scores of Mathematics Attitude Scale test among urban adolescent students and rural adolescent students were 79.829 and 77.1065 and their standard deviation values were 15.50419 and 13.34622 respectively.

**Table 3: Table Showing The Difference of Mean Scores of Mathematics Attitude Scale Test and Their Standard Deviation Among Urban and Rural Adolescent Students**

Groups	N	M	Std. Deviation	Mean Difference $M_1-M_2$	SEd	t-value
URBAN STUDENT S	200	79.829	15.50419	2.7225	0.55713	4.887
RURAL STUDENT S	200	77.1065	13.34622			

**Figure 3:** Graph showing the difference of mean scores of Mathematics Attitude Scale Test and their standard deviation among urban and rural adolescent students



The calculated value of t-value for the above set of data was 4.887 while the table value for the same data at 0.05 level of significance was 1.97 and at 0.01 level of significance was 2.60. This showed that the t-value was

significant at 0.05 level of significance as well as at 0.01 level of significance. It revealed that significant difference exists between mean scores of Mathematics Attitude Scale test among urban adolescent students and rural adolescent students. Hence the null hypothesis that "There is no significant difference between school going rural and urban adolescents in relation to their attitude towards mathematics" stands rejected. This showed that urban adolescent students are having better attitude towards mathematics than rural adolescent students. It was concluded that attitude of students towards mathematics in general and rural one in particular should be enhanced for betterment of individual and society.

### **Major Findings of The Study**

After applying the statistical methods on collected data, the major findings of the study were as follows.

1. The rural adolescent boys were found to have less mathematical attitude in comparison to their urban participants. Urban adolescent boys were found to have more positive attitude towards mathematics than their rural participants.
2. The rural adolescent girls were found to have less mathematical attitude in comparison to their urban participants. Urban adolescent girls were found to have more positive attitude towards mathematics than their rural participants.
3. The mean scores of urban adolescent student (boys and girls both) were higher than their rural participants. The urban students were found to have a positive mathematical attitude than rural participants.

### **Causes of Differences of The Attitude Towards Mathematics of School Going Rural and Urban Adolescents**

**Following can be the possible causes of difference between the mathematical attitude of school going rural and urban adolescents.**

1. Most of the students say that they are not encouraged by their parents to study mathematics. Rural parents are not able to help their wards because they are busy earning to fulfill the family needs and even find it difficult sometimes.
2. There is a lack of availability of resources like math lab facilities and equipment in labs so the interest in mathematics is not properly developed.
3. They feel that mathematics is the most difficult subject in comparison to other subjects.
4. The parents of rural students are mostly uneducated. The family background, social norms and social environment are also the major factors for the difference in attitude towards mathematics.

### **Conclusion**

The study in hand was conducted to find out the difference in mathematical attitude of school going rural and urban adolescents. The present study shows that a significant difference exists between the mean scores of mathematical attitude among rural and urban adolescent boys. A significant difference also exists between the mean scores of mathematical attitude among rural and urban adolescent girls. In an overall view, a significant difference exists between the mean scores of mathematical attitude among rural and urban adolescent students. The results of the study also showed that the better mathematical attitude will lead to the better development of educational standards among adolescents.

Thus it can be concluded that attitude towards mathematics and location are closely related. Rural students are less inclined towards mathematics than urban area students.

### **Suggestions For Further Research**

The present investigation like others was limited in both scope and objectives. The analysis of the data of the study has pointed out several gaps which can be filled in many more studies. Some of the suggestions for the further research in the area are given below.

1. The same study can be conducted on large sample or population.
2. Several other variables such as motivation, socio-economic status etc. can be analyzed for more meaningful interpretation of the data.

3. A comparative study of the high achievers and the low achievers can be made in different areas of the country.
4. Studies of teachers' behaviour and teaching techniques with regard to lack of mathematical attitude of the students can be conducted in different places of the country.
5. A comparative study of perception of rural and urban parents of adolescents in relation to their mathematical attitude can be made.
6. The study may be undertaken for the students studying in higher classes.
7. A study may be taken up to find out relationship between mathematical attitude and attitude towards other school subjects.
8. Same study may be taken up to find out the attitude towards other school subjects like social studies, languages, science etc.
9. This research was conducted after the opening of schools in Uttar Pradesh i.e. after 16 August 2021 in Covid-19 Period. Hence the effect of Covid-19 can also be studied in this regard.

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