

## EFFECT OF DEMOGRAPHICAL VARIABLES ON INTEREST AND ATTITUDE TOWARDS MATHEMATICS AND ACADEMIC ACHIEVEMENT IN MATHEMATICS

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### ABSTRACT

*Students' Interest and attitude toward mathematics is a global issue that directly influences the students' achievement in mathematics. The study aimed to investigate the students' Interests, attitudes toward mathematics and the effects of demographic variables on their Interests and attitude and achievement in mathematics in the selected grade IX Students in palnadu Guntur district of Andhra Pradesh. Nowadays, many professions require mathematical analysis and anticipate mathematical ability to solve innovative difficulties. As a result, the current study is titled A Study of Secondary School Students' Interest Attitudes and Academic Achievement in Mathematics. The researcher randomly picked 800 secondary school students from Palnadu and Guntur districts in Andhra Pradesh. Dr Uma Tandon and Ashok Pal administered the Mathematics Interest Inventory. Dr Ali Imam and Dr Tahira Khatoon developed and standardized a mathematical attitude scale. The descriptive statistical analyses revealed that secondary school students' Interest in mathematics and attitudes toward mathematics have a strong relationship. Interest in mathematics and attitudes toward mathematics are positively associated. The second correlation is a significant positive relationship between Interest in mathematics and mathematical achievement. The third correlation is a favourable relationship between secondary school pupils' attitudes toward mathematics and their achievement in mathematics.*

**KEYWORDS:** *Interest, Attitudes, Mathematics, Achievement in Mathematics*

### INTRODUCTION

We live in a world of mathematics and technology; each of us must have a basic understanding of mathematics to be aware of scientific progress and use it in our daily lives. In India, 80% of students come from rural villages. Therefore they may be unaware of mathematical progress and Interest, among other things. However, due to the impact of their parents and their surroundings, students from metropolitan areas are more conscious of mathematical development and Interest. According to N.C.E.R.T. recommendations, mathematics disciplines should be taught at the school level, with special attention to curriculum development to encourage mathematical creativity, establish a rational outlook, and remove superstition in children. Even though all students are taught the same science courses, there are some discrepancies between boys and girls, urban and rural locations, students in government and private schools, residence and non-residence schools, siblings, parental income, and parental educational background. Such factors may impact the present study: A Study on Interest Attitude and academic Achievement in mathematics of Secondary School students.

**Title of the Study**

"A Study on Interest Attitude and academic Achievement in mathematics of Secondary School students"

**SCOPE OF THE STUDY**

The scope of the present study pertains to A Study on Interest, Attitude, and Academic Achievement in mathematics of Secondary School Students. The basis of data is the response to tools given by the 9Th standard pupils.

**OPERATIONAL DEFINITIONS OF THE KEY TERM**

An operational definition is a statement that describes how to measure a certain variable or how to define a certain term. It is intended to be practical and workable under the conditions of the study, although it may not be a scientifically valid definition. The operational definition is used extensively for abstract as well as physical concepts. A Study on Interest, Attitude and academic Achievement in mathematics of Secondary School students is discussed here.

**Interest in Learning Mathematics**

The state of wanting to know about mathematics. It is the liking of the students to learn mathematics content and participate in mathematics activities, which is indicated by example, solving, studying and getting involved in the mathematical activity as a leisure-time pursuit.

**Attitude towards Mathematics**

It is a generalized attitude toward the universe of mathematics content and is measured in terms of its emotional content opinion, beliefs, prejudices, tendencies and evaluations. Attitude tendencies, either positive or negative about a person or behaviour, can be learned through either our observations or acquired knowledge of mathematics. An attitude is a dispositional readiness to consistently respond to certain situations, persons, or objects, which has been learned and has become one's typical response mode.'

**Mathematical Achievement**

It refers to the progress achieved by 9th standard students during the particular teaching period in particular lessons in a mathematics subject. Knowledge attained or skills developed by pupils usually in the school subjects, measured by test scores or by marks assigned by teachers or by both. Achievement connotes the final accomplishment of something noteworthy, after much effort and often despite obstacles and discouragements. Though achievement covers learning in other areas of life in school and the variety of activities children and young people are involved in developing academic-oriented knowledge and skills, in the present study, it stands for those related to performance in mathematics.

**METHODOLOGY OF THE STUDY**

The descriptive survey approach was used to collect data from the available cases at this inquiry. When the study problem was determined, the research plan was created. A survey technique is a research method, tool, or approach that involves asking a set of questions to a predetermined group of people. It usually makes it easier to convey information between study participants and the person or organization conducting the research. Survey approaches can be qualitative or quantitative, depending on the study and the data you want to collect. For instance, Form Plus can be used to create and administer an online survey that collects statistical data from participants.

**VARIABLES OF THE STUDY**

As the name implies, a variable is anything that changes. Variable refers to measurable characteristics of objects, events, things, and beings. In other words, variables are characters or candidates that the experimenter or investigator can modify, control, or watch. Variables are a prerequisite for doing worthwhile comparative research. The following variables are taken into account in this study.

**Table 1: Classification of the Variables**

S. NO.	Dependent Variables	Independent Variables
1	Academic Achievement	A. Interest in mathematics B. Attitude in mathematics <b>Demographical variables</b> <b>1. Gender</b> ( Boys / Girls) <b>2. Residential area</b> (Rural / Urban) <b>3. Type of management</b> (Government / private) <b>4. Type of school</b> (Residential /non Residential schools) <b>5. Medium of instruction</b> (Telugu / English) <b>6. Parental income</b> (below 1 lakh/above 1 lakh) <b>7. Type of family</b> ( joint family/nuclear family) <b>8. Siblings.</b> (Sibling YES / Sibling NO). <b>9. Parental education background</b> (Below 10/above 10, degree, PG or above)

**OBJECTIVES OF THE STUDY**

The objectives of the present study entitled are: "A Study of Interest in mathematics, Attitude towards mathematics, and Achievement in mathematics of Secondary School pupils in Guntur district of Andhra Pradesh".

- To find out the level of interest in mathematics of secondary school pupils and classify them.
- To find out the level of interest in mathematics with respect to the following components.
  - Objectives of Mathematics study.
  - Importance of Mathematics as a subject.
  - Individual liking for the subject.
- To find out the influence of the following variables on the interest in mathematics of secondary school pupils.
  - Gender
  - Residential Area
  - Type of Management
  - Type of School
  - Medium of Instruction
  - Parental Annual Income
  - Type of Family
  - Siblings

- Parental Education Qualifications
- To find out the level of attitude in mathematics of secondary school pupils, and classify them
- To find out the level of attitude in mathematics with respect to the following components
  - Usefulness of mathematics
  - Confidence in learning mathematics
  - Enjoyment of mathematics
- To find out the influence of the following variables on the attitude in mathematics of secondary school pupils.
  - Gender
  - Residential area
  - Type of management
  - Type of school
  - Medium of instruction
  - Parental annual income
  - Type of Family
  - Siblings
  - Parental education qualification
- To find out the level of achievement in mathematical of the secondary school pupils and classify them.
- To find out the influence of the following variables on the achievement in mathematics of secondary school pupils.
  - Gender
  - Residential area.
  - Type of management
  - Type of school
  - Medium of instruction
  - Parental annual income
  - Type of Family
  - Siblings
  - Parental education qualifications

- To find out the relation between interest in mathematics and attitudes in mathematics
- To find out the relation between interest in mathematics and achievement in mathematics
- To find out the relation between attitudes in mathematics and achievement in mathematics

## **HYPOTHESES OF THE STUDY**

The hypothesis is a guess, a supposition or a tentative inference as to the existence of some fact, condition or relationship relative to some phenomenon which serves to explain such facts as already are known to exist in a given area of research and to guide the search for the new truth.

A hypothesis may be defined as a proposition or a set of propositions set forth as an explanation for the occurrence of some specified group of phenomena, either asserted merely as a provisional conjecture to guide some investigation or accepted as highly probable in the light of facts.

### **The Following Hypotheses were Formulated for the Present Study**

- **Hypothesis 1:** The secondary school students possess a high Interest in Mathematics.
- **Hypothesis 1A:** There would be no significant difference between boys' and girls of secondary school students' interest in mathematics.
- **Hypothesis 1B:** There would be no significant difference between rural and urban secondary school students' interest in mathematics.
- **Hypothesis 1C:** There would be no significant between Government and private secondary school students in their interest in mathematics.
- **Hypothesis 1D:** There would be no significant difference between residential and non-residential secondary school students' interest in mathematics.
- **Hypothesis 1E:** There would be no significant difference between Telugu and English mediums in the secondary school students' interest in mathematics.
- **Hypothesis 1F:** There would be no significant difference between parents with annual income below Rs.100.000 and above Rs.100 000 in the secondary school students' interest in mathematics.
- **Hypothesis 1G:** There would be no significant difference between joint family and nuclear family of the secondary school students in their interest in mathematics.
- **Hypothesis 1H:** There would be no significant difference between siblings 'YES' and sibling 'NO' in the secondary school students' interest in mathematics.
- **Hypothesis 1I:** There would be no significant difference between below 10th, above 10th, degree, P.G. and above, of parental educational qualification of the secondary school students in their interest in mathematics.
- **Hypothesis 2:** The secondary school students possess a high attitude toward mathematics.

- **Hypothesis 2A:** There would be no significant difference between boys' and girls' secondary school students' attitudes toward mathematics.
- **Hypothesis 2B:** There would be no significant difference between rural and urban secondary school students' attitudes toward mathematics.
- **Hypothesis 2C:** There would be no significant between Government and private secondary school students in their attitude toward mathematics.
- **Hypothesis 2D:** There would be no significant difference between residential and non-residential secondary school students' attitudes toward mathematics.
- **Hypothesis 2E:** There would be no significant difference between Telugu and English medium of the secondary school students in their attitude toward mathematics.
- **Hypothesis 2F:** There would be no significant difference between parents with annual income below Rs.100.000 and above Rs.100 000 of the secondary school students in their attitude toward mathematics.
- **Hypothesis 2G:** There would be no significant difference between joint family and nuclear family of the secondary school students in their attitude toward mathematics.
- **Hypothesis 2H:** There would be no significant difference between siblings 'YES' and sibling 'NO' in the secondary school students' attitudes toward mathematics.
- **Hypothesis 2I:** There would be no significant difference between below 10th, above 10th to a degree, P.G. and above, of parental educational qualification of the secondary school students in their attitude in mathematics.
- **Hypothesis 3:** The secondary school students possess high achievement in mathematics.
- **Hypothesis 3A:** There would be no significant difference between boys' and girls' secondary school students in their achievement in mathematics.
- **Hypothesis 3B:** There would be no significant difference between rural and urban secondary school students in their achievement in mathematics.
- **Hypothesis 3C:** There would be no significant between Government and private secondary school students in their achievement in mathematics.
- **Hypothesis 3D:** There would be no significant difference between residential and non-residential secondary school students in their achievement in mathematics.
- **Hypothesis 3E:** There would be no significant difference between Telugu and English medium of the secondary school students in their achievement in mathematics.
- **Hypothesis 3F:** There would be no significant difference between parents with annual income below Rs.100.000 and above Rs.100 000 of the secondary school students in their achievement in mathematics.
- **Hypothesis 3G:** There would be no significant difference between joint family and nuclear family of the secondary school students in their achievement in mathematics.

- **Hypothesis 3H:** There would be no significant difference between siblings 'YES' and sibling 'NO' of the secondary school students in their achievement in mathematics.
- **Hypothesis 3I:** There would be no significant difference between below 10th, above 10th to a degree, P.G. and above, of parental educational qualification of the secondary school students in their Academic Achievement in mathematics.
- **Hypothesis 4** There would be no significant relationship between Interest in mathematics and attitudes toward mathematics of secondary school students.
- **Hypothesis 5** There would be no significant relationship between Interest in mathematics and achievement in mathematics of secondary school students.
- **Hypothesis 6** There would be no significant relationship between achievement in mathematics and attitudes in mathematics of secondary school students.

## **TYPE OF HYPOTHESIS**

The null hypothesis is selected for the present study

### **Geographical Area of the Study**

Out of the 26 districts in Andhra Pradesh, palnadu district and Guntur District is conveniently selected for this study.

### **Population for the Study**

The population for the study consisted of secondary school students studying in the 9th class in high schools in the Guntur district. As per the information received by the Andhra Pradesh government from the 9 class populations, 59.655 students are studying in the year 2021–2022.

### **Sampling Techniques**

A stratified random sample of 800 secondary school students in the Palnadu District the Guntur District was selected for this study.

### **Sample Distribution**

A sample is a subset of a population that has been chosen for observation and investigation. We can make inferences about the features of the population by looking at the quality of the sample. The investigator randomly chose 800 secondary school students from rural and urban schools in the Guntur district for the current study. The researcher utilized a stratified random sampling method. The process of picking a sample from a population is known as sampling. For this purpose, the population is divided into several segments called "sample units."

### **Hypothesis 1A**

There would be no significant difference between boys and girls of secondary school students in their interest in mathematics.

**Table 1: Mean, S.D and t-values of Boys and Girls in their Interest in Mathematics**

Gender	N	Mean	% of mean	S.D.	S. Ed	't'
Boys	397	66.43	55.35	7.77	0.555	3.50
Girls	403	68.368	56.96	7.91		

\*\* Significant at 0.05 Level

### Finding

From the above table (1), it is found that the "t" value is 3.50, which is significant at the 0.05 level. Hence, the hypothesis is that "There is no significant difference in the interest in mathematics of boys and girls in secondary schools." It can be rejected for the variable "gender" at the 0.05 level of significance. The result shows that gender has an impact on their interest in mathematics. Boys and girls have different levels of interest in mathematics. Girls have better performance in mathematics when compared with boys.

### Hypothesis 1B

There would be no significant difference between rural and urban of the secondary school students in their interest in mathematics.

**Table 2: Mean S.D and t-Values of Rural and Urban Secondary Students in their Interest in Mathematics**

Gender	N	Mean	% of mean	S.D.	S. Ed	't'
Rural	397	67.15	55.95	8.31	0.56	2.64*
Urban	403	68.64	57.20	7.55		

\* \* Significant at 0.01 Level.

### Finding

From the above table (2), it is found that the "t" value is 2.64, which is significant at 0.05 levels. Hence, the hypotheses are, "There is no significant difference in the interest in mathematics of rural and urban secondary school students." It can be rejected for the variable "locality" at the 0.05 level of significance. The result shows that the locality impacts their interest in mathematics. Rural students and urban students are at different levels in their interest in mathematics. Urban students have better performance interest in mathematics when compared with rural students.

### Hypothesis 1C

There would be no significant between Government and private of the secondary school students in their interest in mathematics.

**Table 3: Mean S.D and t-Values of Government and Private of Secondary School Students in their Interest in Mathematics**

Variable	N	Mean	% of mean	S.D.	S. Ed	't'
Government	397	67.56	56.30	8.55	0.56	2.37*
Private	403	68.89	57.40	7.30		

\*\* Significant at 0.05 Level



**Finding**

From the above table (3), it is found that the "t" value is 2.37, which is significant at 0.05 levels. Hence, the hypothesis is that there is no significant difference in the interest in the mathematics of government and private secondary school students. It can be rejected for the variable "type of management" at the 0.05 level of significance. The result shows that the type of management impacts the interest in the mathematics of secondary school students.

**Hypothesis 1D**

There would be no significant difference between residential and non-residential of the secondary school students in their interest in mathematics.

**Table 4: Mean S.D and t-values of Residential and Non Residential Secondary School Students in their Interest in Mathematics**

Type of School	N	Mean	% of mean	S.D.	S. Ed	't'
Residential	262	67.85	56.54	7.41	0.59	1.76
Non Residential	538	68.89	57.40	8.14		

Not Significant at 0.05 Level

**Finding**

From the above table (4), it is found that the "t" value is 1.76, which is not significant at the 0.05 level. Hence, the hypothesis is that "There would be no significant difference between residential and non-residential of the secondary school students in their interest in mathematics." It can be rejected for the variable "type of school" at a 0.05 level of significance. The result shows that the type of school did not impact the interest in the mathematics of secondary school students. Both-residential and non-residential school students have the same performance in their interest in mathematics.

**Hypothesis 1E**

There would be no significant difference between Telugu and English medium of the secondary school students in their interest in mathematics.

**Table 5: Mean S.D and t-Values of Telugu Medium and English Medium Secondary School Students in their Interest in Mathematics**

Medium of Instruction	N	Mean	% of mean	S.D.	S. Ed	't'
Telugu	223	68.05	56.70	8.30	0.62	1.45
English	577	67.66	56.38	7.85		

Not Significant at 0.05 Level

**Finding**

From the above table (5), it is found that the "t" value is 0.618, which is not significant at the 0.05 level. Hence, the hypothesis is that "There would be no significant difference between Telugu and English medium of the secondary school students in their interest in mathematics." It can be accepted for the variable "medium of instruction" at a 0.05 level of significance. The result shows that the medium of instruction had no impact on the interest in the mathematics of secondary school students. Telugu and English-medium students show the same level of interest in mathematics.

### Hypothesis 1F

There would be no significant difference between parents with annual income below Rs.100,000 and above Rs.100,000 of the secondary school students in their attitude in mathematics.

**Table 6: Mean S.D and t-Values of Parents with an Annual Income below Rs.100,000 and above Rs.100,000, Secondary School Students in their Interest in Mathematics**

Variable	Sample	Mean	SD	% of mean	S. Ed	't' value
Above Rs.100,000	250	68.350	8.947	56.95	0.617	2.0
Below Rs.100,000	550	67.13	7.513	55.94		

\* Significant at 0.05 Level

### Findings

From the above table (6), it is found that the "t" value is 2.0, which is significant at the 0.05 level. Hence, the hypothesis is that "There would be no significant difference between parents with annual income below Rs.100,000 and above Rs.100,000 of the secondary school students in their attitude in mathematics". It can be rejected for the variable parental annual income. Above one lakh annual income students have better performance than below one lakh annual income students.

### Hypothesis 1G

There would be no significant difference between joint family and nuclear family of the secondary school students in their interest in mathematics.

**Table 7: Mean S.D and t-Values of Joint Family and Nuclear Family of Secondary School Students in their Interest in Mathematics**

Type of Family	N	Mean	% of mean	S.D.	S. Ed	't'
Joint Family	250	66.439	60.39	7.938	0.608	3.0
Nuclear Family	550	68.308	62.09	7.987		

\*Significant at 0.05 Level

### Finding

From the above table (7), it is found that the t value is 3.0, which is significant. Hence, the hypothesis is that "There would be no significant difference between joint family and nuclear family of the secondary school students in their interest in mathematics." And it is rejected for the variable "type of family" at a 0.05 level of significance.

### Hypothesis 1H

There would be no significant difference between siblings 'YES' and sibling 'NO' of the secondary school students in their interest in mathematics.

**Table 8: Mean S.D and t-Values of Siblings of 'yes' or no of Secondary School Students in their Interest in Mathematics**

Type of School	N	Mean	S.D	% of mean	S. Ed	't'
YES	593	68.359	7.806	56.95	0.635	3.79
NO	207	66.14	8.07	55.34		

\*\* Significant at 0.05 Level

**Finding**

From the above table (8), it is found that the "t" value is 3.79, which is significant at the 0.05 level. Hence, the hypothesis is that there would be no significant difference between siblings 'YES' and sibling 'NO' of the secondary school students in their interest in mathematics." It can be rejected for the variable "number of siblings" has a 0.05 level of significance. Secondary school students from siblings 'yes' possessed a higher interest in mathematics than secondary school students than siblings' no. The interest in mathematics was dispersed widely in secondary schools students from siblings 'yes' or siblings no.

**Hypothesis 1I**

There would be no significant difference between below 10<sup>th</sup>, above 10<sup>th</sup>, degree, PG and above, of parental educational qualification of the secondary school students in their interest in mathematics.

**Table 9: Mean S.D and t-Values of Parental Educational Background of Secondary School Students in their Interest in Mathematics: (ANOVA)**

Parental Educational back Ground	No	Mean	S.D.	df	SSM	SSW	'F' Value
Below 10 <sup>th</sup>	100	68.25	7.81	796	54.744	30.025	0.548
Above 10 <sup>th</sup>	275	67.44	7.22				
degree	250	68.19	7.34				
PG/Above	175	67.98	7.52				

Not Significant at 0.05

**Findings**

From the above table (9), it is found that the "f" value is 0.548, which is not significant at the 0.05 level. Hence, the hypothesis is that There would be no significant difference between below 10<sup>th</sup>, above 10<sup>th</sup>, degree, PG and above, of parental educational qualification of the secondary school students in their interest in mathematics. It can be accepted for the variable parental educational background.

**SECTION- B (Attitude towards Mathematics)**

**Objective Wise Analysis in Attitude towards Mathematics**

**Hypothesis 2**

The secondary school students are possessing high attitude towards in mathematics.

**Table 10: Level of Attitude towards Mathematics Possessed by the Whole Sample**

Sample	Sample Size	Mean	% of Mean	Standard Deviation
Whole	800	65.429	59.47	9.483

**Finding**

As per table (10) and the manual on the attitude in mathematics, all the secondary school students fall under the average level of Interest. The Interest in mathematics was dispersed widely among secondary school students. The interest in the mathematics of the whole sample was normal. Hence, the hypothesis is that "The secondary school students possess a high attitude towards mathematics." It can be rejected as the secondary school students possess an average level of attitude toward mathematics.

### Variable Wise Analysis in Attitude towards Mathematics

#### Hypothesis 2A:

There would be no significant difference between boys and girls of secondary school students in their attitude in mathematics.

**Table 11: Mean S.D and t-values of Boys and Girls of Secondary School Students in their Attitude towards Mathematics**

Variable	Sample	Mean	SD	% of mean	S. Ed	't' value
Boys	397	62.15	9.05	56.50	0.648	3.03*
Girls	403	64.09	9.26	58.26		

\* Significant at 0.05 Level

#### Finding

From the above table (11), it is found that the "t" value is 3.03, which is significant at 0.05 levels. Hence, the hypotheses are, "There would be no significant difference between boys and girls of secondary school students in their attitude in mathematics." It is rejected for the variable gender at the 0.05 level of significance. The girl students hold a higher attitude towards mathematics than boys. The attitude toward mathematics was dispersed widely among the secondary school boys and girls.

#### Hypothesis 2B

There would be no significant difference between rural and urban of the secondary school students in their attitude in mathematics.

**Table 12: Mean S.D and t-Values of Rural and Urban of Secondary School Students in their Attitude towards Mathematics**

Variable	Sample	Mean	SD	% of mean	S. Ed	't' value
Rural	397	63.30	9.51	57.54	0.664	2.65
Urban	403	65.05	9.26	59.13		

\* Significant at 0.05 Level

#### Finding

From the above table (12), it is found that the "t" value is 3.03, which is significant at 0.05 levels. Hence, the hypothesis is, "There would be no significant difference between rural and urban of the secondary school students in their attitude in mathematics." It is rejected for the variable "Residential area" Significant at the 0.05 level. The rural and urban secondary school students had an average level of attitude towards mathematics with a significant difference between them. The urban secondary school students possessed a higher attitude towards mathematics than their counterparts.

#### Hypothesis 2C

There would be no significant between Government and private of the secondary school students in their attitude in mathematics.

**Table 13: Mean S.D and t-Values of Government and Private of Secondary School Students in their Attitude towards Mathematics**

Variable	Sample	Mean	SD	% of mean	S. Ed	't' value
Government	397	62.13	9.90	56.48	0.65	3.92
Private	403	64.68	8.46	58.80		

\* Significant at 0.05 Level

### Finding

From the above table (13), it is found that the "t" value is 3.92, which is significant at 0.05 levels. Hence, the hypothesis is, "There would be no significant between Government and private of the secondary school students in their attitude in mathematics." It can be rejected for the variable type of management significant at the 0.05 level. Both government and private secondary school students possessed an average attitude towards mathematics with a significant difference between them. Private secondary school students hold a higher attitude towards mathematics than their counterparts. The attitude towards mathematics dispersed widely in government and private secondary school students.

### Hypothesis 2D

There would be no significant difference between residential and non-residential of the secondary school students in their attitude in mathematics.

**Table 14: Mean S.D and t-Values of Residential and Non- Residential of Secondary School Students in their Attitude towards Mathematics**

Variable	Sample	Mean	SD	% of mean	S. Ed	't' value
Residential	262	62.465	8.868	56.78	0.713	2.30
Non Residential	538	64.101	9.732	58.27		

\* Significant at 0.05 Level

### Finding

From the above table (14), it is found that the "t" value is 2.30, which is significant at 0.05 levels. Hence, the hypothesis is, "There would be no significant difference between residential and non-residential of the secondary school students in their attitude in mathematics." It can be rejected for the variable type of school significant at the 0.05 level. Both residential and non-residential secondary school students possessed an average attitude towards mathematics, with a significant difference. The non-residential secondary school students possessed a higher attitude towards mathematics than residential secondary school students.

### Hypothesis 2E

There would be no significant difference between Telugu and English medium of the secondary school students in their attitude in mathematics.

**Table 15: Mean S.D and t-Values of English Medium and Telugu Medium of Secondary School Students in their Attitude towards Mathematics**

Variable	Sample	Mean	SD	% of mean	S.Ed	't' value
Telugu	223	64.021	10.00	58.20	0.748	1.01
English	577	63.227	9.276	57.51		

Not Significant at 0.05 Level

### Finding

From the above table (15), it is found that the "t" value is 1.01, which is not significant at 0.05 levels. Hence, the hypothesis is, "There would be no significant difference between Telugu and English medium of the secondary school students in their attitude in mathematics." It can be accepted for the variable medium of instruction not significant at the 0.05 level. Both Telugu medium and English medium secondary school students possessed an average attitude towards mathematics with no significant difference between them.

### Hypothesis 2F

There would be no significant difference between parents with annual income below Rs.100,000 and above Rs.100,000 of the secondary school students in their attitude in mathematics.

**Table 16: Mean S.D and t-Values of Parents with an Annual Income below Rs.100,000 and above Rs.100,000 of Secondary School Students in their Attitude towards Mathematics**

Variable	Sample	Mean	SD	% of mean	S. Ed	't' value
Above Rs.100,000	250	64.241	11.24	58.40	0.733	2.36
Below Rs.100,000	550	62.511	8.60	56.82		

\* Significant at 0.05 Level

### Finding

From the above table (16), it is found that the "t" value is 1.01, which is not significant at 0.05 levels. Hence, the hypothesis is, "There would be no significant difference between parents with annual income below Rs.100,000 and above Rs.100,000 of the secondary school students in their attitude in mathematics.." It can be rejected for the variable parental annual income. As per the mean values, secondary school students of parents with an annual income above Rs.100,000 and below Rs. One hundred thousand families held an average attitude towards mathematics with a significant difference between them. The secondary school students of parents with an annual income above Rs.100,000 had a higher attitude towards mathematics than their counterparts.

### Hypothesis 2G

There would be no significant difference between joint family and nuclear family of the secondary school students in their attitude in mathematics.

**Table 17: Mean S.D and t-Values of between Joint Family and Nuclear Family of Secondary School Students in their Attitude towards Mathematics**

Variable	Sample	Mean	SD	% of mean	S. Ed	't' value
Joint family	250	61.543	9.521	55.94	0.718	3.61
Nuclear family	550	64.114	9.172	58.28		

\* Significant at 0.05 Level

### Finding

From the above table (17), it is found that the "t" value is 3.61, which is significant at 0.05 levels. Hence, the hypothesis is "There would be no significant difference between joint family and nuclear family of the secondary school students in their attitude in mathematics". It is rejected for the variable type of family. Both joint family and nuclear family of secondary school students possessed an average attitude towards mathematics with a significant difference between them. The nuclear family of secondary school students possessed a higher attitude towards mathematics than students belonging to a joint

family. The attitude towards mathematics was dispersed widely among secondary school students' joint families and nuclear families.

**Hypothesis 2H**

There would be no significant difference between siblings 'YES' and sibling 'NO' of the secondary school students in their attitude in mathematics.

**Table 18: Mean S.D and t-Values of between Sibling 'yes' or Siblings no of Secondary School Students in their Attitude towards Mathematics**

Variable	Sample	Mean	SD	% of mean	S. Ed	't' value
Sibling 'yes'	593	64.201	9.35	58.36	0.755	3.58
Sibling No	207	61.514	9.33	55.91		

\* Significant at 0.05 Level

**Finding**

From the above table (18), it is found that the "t" value is 3.58, which is significant at 0.05 levels. Hence, the hypothesis is "There would be no significant difference between siblings 'YES' and sibling 'NO' of the secondary school students in their attitude in mathematics." it is rejected for the variable number of siblings. As per the mean values, the secondary school students from a sibling, No, and sibling 'yes' possessed an average attitude towards mathematics with a significant difference between them.

**Hypothesis 2I**

There would be no significant difference between below 10<sup>th</sup>, above 10<sup>th</sup> to degree, PG and above, of parental educational qualification of the secondary school students in their attitude in mathematics.

**Table 19: Mean S.D and t-Values of between Parental Educational Backgrounds of Secondary School Students in their Attitude towards Mathematics: (ANOVA)**

Parental Educational back Ground	No	Mean	S.D.	df	SSM	SSW	'F' Value
Below 10 <sup>th</sup>	100	64.61	9.27	796	85.909	9.706	8.851
Above 10 <sup>th</sup>	275	65.04	9.08				
Degree	250	64.71	9.44				
PG/above	175	64.32	9.30				

Significant at 0.05 Level

**Findings**

From the above table (19), it is found that the "f" value is 8.851 which is significant at the 0.05 level. Hence, the hypothesis is that: There would be no significant difference between below 10<sup>th</sup>, above 10<sup>th</sup> to a degree, PG and above, of parental educational qualification of the secondary school students in their attitude in mathematics. It can be rejected for the variable parental educational background significant at 0.05 level. Parents with above 10<sup>th</sup> education qualification are highly performance than other qualification of parents in their attitude toward mathematics.

**SECTION- C**

In this section, the researcher presented the analysis of the collected data from the sample through two questionnaires. The data was analyzed and presented in the form of tables with their interpretation in the process of drawing out findings and discussions for the objectives 7 and 8.

### Hypothesis 3

The secondary school students are possessing high achievement in mathematics.

**Table 20: Showing mean, % of mean, S.D of the Academic Achievement in Mathematics of Secondary School Students**

Sample	Total Sample	Mean	S.D
Whole	800	58.70	10.593

### Finding

As per table 20 and the manual the achievement in mathematics, all secondary school students fall under the average level of achievement in mathematics. Hence the hypothesis is that "the secondary school students possess high achievement in mathematics". It can be rejected. All the secondary school students possessed an average level of achievement in mathematics.

### Variable Wise Analysis in Academic Achievement

#### Hypothesis 3A

There would be no significant difference between boys and girls of secondary school students in their achievement in mathematics.

**Table 21: Mean S.D and t- Values of Boys and Girls in their Academic Achievement in Mathematics**

Gender	N	Mean	S.D.	S. Ed	't'
Boys	397	55.430	10.582	0.730	2.60
Girls	403	57.368	10.051		

\*\* Significant at 0.05 Level

### Finding

From the above table (21), it is found that the "t" value is 2.60, which is significant at 0.05 levels. Hence, the hypothesis is "There would be no significant difference between boys and girls of secondary school students in their achievement in mathematics".

It can be rejected for the variable is gender. Both boys and girls in secondary schools possessed high achievement in mathematics with a significant difference between them. Secondary school boys possessed less achievement in mathematics than secondary school girls. Mathematics achievement was dispersed widely among boys and girls.

#### Hypothesis 3B

There would be no significant difference between rural and urban of the secondary school students in their achievement in mathematics.

**Table 22: Table 4.25: Mean S.D and t-values of Rural and Urban in their Academic Achievement in Mathematics**

Locality	N	Mean	S.D.	S. Ed	't'
Rural	397	51.120	11.333	0.727	8.44
Urban	403	57.225	9.123		

\*\* Significant at 0.05 Level



**Finding**

From the above table (22), it is found that the "t" value is 8.44, which is significant at 0.05 levels. Hence, the hypothesis is "There would be no significant difference between boys and girls of secondary school students in their achievement in mathematics". It can be rejected for the variable is a residential area. As per table 4.45, both rural and urban secondary school students possessed average achievement in mathematics with a significant difference between them. The urban secondary school students possessed significantly high achievement than rural secondary school students.

**Hypothesis 3C**

There would be no significant between Government and private of the secondary school students in their achievement in mathematics.

**Table 23: Mean S.D and t-Values of Government and Private School Students in their Academic Achievement in Mathematics**

Variable	Sample	Mean	SD	S. Ed	't' value
Government	397	53.52	11.36	0.716	6.05
Private	403	57.82	8.69		

\*\*Significant at 0.05 Level

**Finding**

From the above table (23), it is found that the "t" value is 6.05, which is significant at 0.05 levels. Hence, the hypothesis is that there would be no significant between Government and private secondary school students in their achievement in mathematics. It can be rejected for the variable "type of management" at the 0.05 level of significance. The private secondary school students possessed high achievement in mathematics than government secondary school students.

**Hypothesis 3D**

There would be no significant difference between residential and non-residential of the secondary school students in their achievement in mathematics.

**Table 24: Mean S.D and t-Values of Residential and Non-Residential School Students in their Academic Achievement in Mathematics**

Variable	Sample	Mean	SD	S. Ed	't' value
Residential	262	52.401	10.31	0.796	4.92
Non Residential	538	56.292	10.68		

\* Significant at 0.05 Level

**Finding**

From the above table (24), it is found that the "t" value is 4.92, which is significant at the 0.05 level. Hence, the hypothesis is that "there would be no significant difference between residential and non-residential of the secondary school students in their achievement in mathematics". It can be rejected for the variable "type of residency" at the 0.05 level of significance.

**Hypothesis 3E**

There would be no significant difference between Telugu and English medium of the secondary school students in their achievement in mathematics.

**Table 25: Mean S.D and t-Values of Telugu Medium and English Medium Secondary School Students in their Academic Achievement in Mathematics**

Variable	Sample	Mean	SD	S. Ed	't' value
Telugu	223	50.050	12.07	0.830	5.55
English	577	57.661	9.86		

\*\* Significant at 0.05 Level

### Finding

From the above table (25), it is found that the "t" value is 5.55, which is significant at the 0.05 level. Hence, the hypothesis is that "There would be no significant difference between Telugu and English medium of the secondary school students in their achievement in mathematics". It can be rejected for the variable "medium of instruction" at a 0.05 level of significance. The finding reveals that both Telugu and English medium secondary school students possessed average achievement in mathematics with a significant difference between them. The English medium secondary school students possessed significantly high achievement in mathematics than Telugu medium secondary school students.

### Hypothesis 3F

There would be no significant difference between parents with annual income below Rs.100,000 and above Rs.100,000 of the secondary school students in their achievement in mathematics.

**Table 26: Mean S.D and t-Values of Parents with an Annual Income below Rs.100,000 and above Rs.100,000 Secondary School Students in their Academic Achievement in Mathematics**

Variable	Sample	Mean	SD	S. Ed	't' value
Above Rs.100,000	250	53.69	13.50	0.82	4.13
Below Rs.100,000	550	57.08	9.08		

\* Significant at 0.05 Level

### Finding

From the above table (26), it is found that the "t" value is 4.13, which is significant at the 0.05 level. Hence, the hypothesis is, "There would be no significant difference between parents with annual income below Rs.100,000 and above Rs.100,000 of the secondary school students in their achievement in mathematics." It can be rejected for the variable parental annual income. The finding reveals that achievement in mathematics of both secondary school students of parents with an annual income below Rs.100,000 and above Rs.100,000 income possessed average achievement in mathematics with a significant difference between them. Parents with an annual income below Rs.100,000 students have better performance in achievement in mathematics than those above Rs.100,000 students.

### Hypothesis 3G

There would be no significant difference between joint family and nuclear family of the secondary school students in their achievement in mathematics.

**Table 27: Mean S.D and t-Values of Joint Family and Nuclear Family Secondary School Students in their Academic Achievement in Mathematics**

Variable	Sample	Mean	SD	S. Ed	't' value
Joint family	250	52.10	11.18	0.789	6.44
Nuclear family	550	57.13	8.17		

\* Significant at 0.05 Level

**Finding**

From the above table (27), it is found that the "t" value is 6.44, which is significant at 0.05 levels. Hence, the hypothesis is "There would be no significant difference between joint family and nuclear family of the secondary school students in their achievement in mathematics". It is rejected for the variable type of family. Both joint family and nuclear family of secondary school students possessed an average level of achievement in mathematics with a significant difference between them. The nuclear family of secondary school students possessed higher achievement in mathematics than students belonging to a joint family.

**Hypothesis 3H**

There would be no significant difference between siblings 'YES' and sibling 'NO' of the secondary school students in their achievement in mathematics.

**Table 28: Mean S.D and t-values of Sibling "no" and Sibling 'yes' family Secondary School Students in their Academic Achievement in Mathematics**

Sibling	Sample	Mean	SD	S. Ed	't' value
YES	593	57.30	9.66	0.82	4.03
NO	207	53.99	11.71		

\* Significant at 0.05 Level

**Finding**

From the above table (28), it is found that the "t" value is 4.03, which is significant at the 0.05 level. Hence, the hypothesis is that "There would be no significant difference between siblings 'YES' and sibling 'NO' of the secondary school students in their achievement in mathematics." As per the mean values, the secondary school students belonging to sibling "no" and sibling 'yes' possessed average achievement in mathematics with a significant difference between them. The sibling 'yes' secondary school students possessed higher achievement in mathematics than their counterparts.

**Hypothesis 3I**

There would be no significant difference between below 10<sup>th</sup>, above 10<sup>th</sup> to degree, PG and above, of parental educational qualification of the secondary school students in their Academic Achievement in mathematics.

**Table 29: Mean S.D and t-Values of Parental Educational Background of Secondary School Students in their Academic Achievement in Mathematics. (ANOVA)**

Parental Educational back Ground	No	Mean	S.D.	df	SSM	SSW	'F' Value
Below 10 <sup>th</sup>	100	58.1	10.14	796	105.45	17.46	6.036
Above 10 <sup>th</sup>	275	58.34	10.22				
Degree	250	58.21	10.31				
PG/above	175	57.66	10.36				

**Findings**

From the above table (29), it is found that the "f" value is 6.036 which is significant at the 0.05 level. Hence, the hypothesis is that: There would be no significant difference between below 10<sup>th</sup>, above 10<sup>th</sup> to degree, PG and above, of parental educational qualification of the secondary school students in their Academic Achievement in mathematics. It can be rejected for the variable parental educational background significant at 0.05 level. Parents with above 10<sup>th</sup> education qualification are highly performance in Academic Achievement in mathematics.

## CONCLUSION

According to N.C.E.R.T. recommendations, mathematics disciplines should be taught at the school level, with special attention to curriculum development to encourage mathematical creativity, establish a rational outlook, and remove superstition in children. Even though all students are taught the same science courses, A positive attitude involves problem-solving abilities, abstract and logical thinking, curiosity, accuracy, the habit of inquiry, and perfectionism, which aid academic development. In this paper, the Researcher gives the overall findings of interest attitude and mathematical achievement of secondary school students, including findings, Conclusions, suggestions to parents and teachers, and limitations. He describes the problems, and further research is suggested.

## BIBLIOGRAPHY

1. Kaplan, K. (2010). *Female climate and income as determinants of educational achievement. Behavioural Scientist, 5(1), 55-57.*
2. Kaur, J., & Kaur, S. (2011). *Effect of concept attainment model of teaching on mathematical achievement of secondary school students. Journal of Education Research and Extension, 48(3), 37-46.*
3. Kaur, S.(2014). *Study of achievement in mathematics and academic stress in relation to the attitude towards mathematics. Research Journal of Social Sciences,22 (1),15- 30.*
4. Khatoon, T., & Mahmood, S. (2011). *Mathematics anxiety among secondary school students in India and its relationship to achievement in mathematics. European Journal of Social Sciences, Vol. 16(1), pp. 75-86.*
5. Kleanthous, Irene and Williams, Julian. "Perceived Parental Influence on Students' Mathematical Achievement, Inclination to Mathematics and Dispositions to Study further Mathematics." *Proceedings of the British Congress for Mathematics Education (April 2010) 129-136.*
6. Kouassi, Susan Frazier. "A Psychological Study of Mathematics Attitudes and Achievement among Female Ivorian Students", *University of Michigan, (November 1999) 268.*
7. Kundu, A., & Ghose, A.(2016). *The relationship between attitude towards and achievement in mathematics among higher secondary students. International Journal of Multidisciplinary Research and Development, 3 (6), 69-74.*
8. Mahanta, S., & Islam M. (2012). *Attitude of secondary students towards mathematics and its relationship to achievement in mathematics. International Journal of Computer Technology & Applications, 3 (2), 713-715.*
9. Mahanta, Sabita and Islam, Mofidul. "Attitude of Secondary Students towards Mathematics and its Relationship to Achievement in Mathematics." *International Journal of Computer Technolom & Applications, (2012), Vo1.3(2) : 713-715.*
10. Mangeswari bibliography
11. Mata, M. L., Monteiro, V., & Peixoto, F. (2012). *Attitudes towards mathematics: Effects of individual, motivational, and social support factors. Hindawi Publishing Corporation Child Development Research. Portugal, 1149-041.*
12. *Mathematical anxiety. Retrieved from Wikipedia, December22, 2011.*

13. *Mathematics*. Retrieved from Wikipedia. December 22, 2011. *Mathematics optional in class x? high court weighs in.* (2017, June 20). *The Telegraph*, pp.Math fear to math joy! Make many enjoy. Retrieved from <http://www.wordpress.com,December22, 2011>.
14. Mensah, J. K., Okyere, M., & Kuranchie, A. (2013). *Student attitude towards mathematics*
15. Mensah, J.k., Okyere, M.& Kuranchie, A.(2013). *Student attitude towards Mathematics and performance: Does the teacher attitude matter? Journal of Education and Practice*,4(3), 132-139.
16. Michael, E.M., & Seaman, W.I. (2007). *The effects of different undergraduate mathematics courses on the content knowledge and attitude towards mathematics of preservice elementary teachers issues in the undergraduate mathematics preparation of school teachers, Vol.1.*
17. Michelli, M.P. (2013). *The relationship between attitudes and achievement in mathematics among fifth grade students, Honors Theses.*
18. Mji, A., & Makgato, M. (2006). *Factors associated with high school learners, poor performance: A spotlight on mathematics and physical science. South African Journal of Education, Vol(2), 253-266.*
19. Mohd, N., & Mahmood, T.F.P.T. (2011). *The effects of attitude towards problem solving in mathematics achievement. Australian Journal of Basic and Applied Sciences, 5(12), pp.1857-1862.*
20. Mubeen, S., Saeed, S.& Arif, M.H.(2013). *Attitude towards mathematics and academic achievement in mathematics among secondary level boys and girls. Journal Of Humanities And Social Science (JHSS)*,6(4), 38-41.
21. Muhammad, Zita. "Effects of Cooperative Learning Intervention on Mathematics Achievement Outcomes and Attitudes of Non-Science College Majors." Ph.D. Thesis Abstract, Southern University, 2010.
22. Nirmla, P., Raj, S.A. Sander, M., & Kumaran, D. (2006). *Optimization of academic achievement in mathematics - A linear programming approach. Educational Tracks, 6(3), 32-37.*
23. O'kwu; Ijenkeli, Emmanuel and Igber, Anyagh, Paul. "Effect of Career-Related Instruction on Students' Mathematics Achievement in Senior Secondary Schools in Benue State, Nigeria." *Educational Research (August 2010), Vo1.1(7) : 206-209.*
24. Pachpande, Narendra Girdhar. "Study of Effect of Advanced Organizer Model on Achievement of Students in Mathematics Teaching at School Level", *Indian Streams Research Journal (July 2012), Vol. II(VI).*
25. Panchalingappa, N. (2004). *Self-confidence, anxiety, study habits and mathematics achievement of underachievers at secondary school level. Experiment in Education, Vol.32(12), pp. 16-21.*

