

A STUDY OF THE PERFORMANCE OF SECONDARY SCHOOL CHILDREN IN RELATION TO THEIR INTEREST AND ATTITUDE TOWARDS MATHEMATICS

Dr.J.Shakila¹ & Dr. A. Surya Kanaka Durga²

1 Principal, D.N.R College of Education, Bhimavaram, West Godavari DT, Andhra Pradesh.

2 Principal, SRSV College of Education, Vijayawada, NTR DT, Andhra Pradesh.

Paper Received On: 5 FEBRUARY 2023

Peer Reviewed On: 28 FEBRUARY 2023

Published On: 01 MARCH 2023

Abstract

The objective of the current research is to find out the performance in mathematics of secondary school children in relation to their interest and attitude towards mathematics. In this study, a sample of 815 secondary school students from the Krishna district in Andhra Pradesh was investigated using a descriptive survey research technique. For the purpose of this study, the researcher used the Formative-I grades for academic achievement in mathematics that the students in classes VIII and IX received as an indicator of their level of proficiency in the subject. In order to gather data for this inquiry, Dubey, L.N. (2004)'s Mathematics Interest Inventory and Sridevi.(2015)'s Attitude Towards Mathematics Scale were both developed and standardized. The objectives of the study were: 1. To Study the effect of the following variables on the achievement in mathematics, interest in mathematics and attitude towards mathematics among secondary school children with respect to certain variables like gender, locality of living and class of studying. Results showed that Gender, locality of living and class studying make a significant difference in secondary school children's achievement in mathematics. Gender, locality of living make a significant difference in the attitude and interest of secondary school children towards mathematics. Class studying make no significant difference in the attitude and interest of secondary school children towards mathematics.

Keywords: Achievement/ Performance, Interest, Attitude and Secondary School Children

Introduction:

In the 21st century, mathematics has emerged as a fundamental discipline that contributes significantly to progress and development in every sphere of life. It is often regarded as the foundation of all sciences because scientific discoveries, technological advancements, and research activities are largely dependent on mathematical principles. Mathematics represents one of the essential components of the three R's—reading, writing, and arithmetic—and plays a vital role in developing logical thinking and intellectual abilities among learners.

Mathematics provides a strong foundation for students to achieve various academic and life goals. The study of mathematics enhances mental ability, reasoning capacity, analytical thinking, and problem-solving skills. It also promotes discipline, accuracy, independent learning, perseverance, and systematic work habits among students. Through mathematical learning, students develop the ability to analyze situations, formulate solutions, and make rational decisions.

Interest in mathematics plays an important role in students' learning and achievement. Mathematical interest may not always be associated with verbal and numerical abilities required for pursuing advanced studies or careers in mathematics; however, developing interest among students is essential for nurturing intellectual qualities such as critical thinking, reasoning, creativity, analysis, synthesis, and innovation. A positive attitude towards mathematics influences students' willingness to learn and improves their achievement. Students who recognize the importance and relevance of mathematics are more motivated to engage in learning activities and enhance their mathematical performance (Ajisuksmo & Saputri, 2017).

Attitude towards mathematics reflects students' feelings, beliefs, interest, enjoyment, confidence, and involvement in learning the subject. A positive attitude encourages students to overcome difficulties and develop confidence in mathematical learning, whereas negative attitudes may create fear and reduce participation. The National Curriculum Framework (NCF, 2005) emphasized the importance of developing positive attitudes towards mathematics education and recommended activity-based teaching approaches to make mathematics more meaningful and enjoyable. Strategies such as mathematical games, puzzles, and real-life problem-solving activities can effectively promote students' interest and positive perceptions towards mathematics.

Students are the future strength of a nation, and developing a positive attitude towards mathematics among learners is essential for improving mathematical achievement and preparing them to contribute effectively to scientific, technological, and social development. Therefore, fostering mathematical interest and a positive attitude should be a major objective of mathematics education.

Review of related literature:

In the present study, the investigator reviewed previous research studies related to academic achievement, interest, and attitude towards mathematics. The review of literature revealed that several researchers have examined various factors influencing students' mathematics achievement and learning outcomes.

Benjamin and Murugaraju (2021) investigated the mathematics achievement of IX standard students. The findings revealed that students' mathematics achievement was not significantly influenced by gender and locality, indicating that these variables had a limited impact on their mathematical performance.

Maamin et al. (2021) examined the relationship between student engagement and mathematics achievement among secondary school students. The findings of multiple linear regression analysis revealed that different dimensions of student engagement contributed significantly to mathematics achievement. Among these, effective engagement showed the highest contribution, followed by behavioural engagement and cognitive engagement. The study emphasized the importance of active student participation in improving mathematics learning outcomes.

Sarmah and Das (2020) explored students' attitudes towards learning mathematics in traditional and digital classroom environments among secondary school students in Guwahati city. The findings revealed significant differences in students' attitudes towards mathematics learning across classroom environments. The study also indicated that students' attitudes towards mathematics were significantly associated with their academic achievement, particularly in digital learning environments.

Poudel (2020) investigated mathematics interest among ethnic groups in Nepal. The findings revealed that students generally showed a low level of interest in mathematics, highlighting the need for innovative teaching strategies to improve learners' motivation and interest towards the subject. The study suggested that teachers should adopt effective and engaging instructional approaches to develop students' interest in mathematics at different educational levels.

Lakshmi Karthika and Suresh Kumar (2018) studied mathematics interest among higher secondary students in Tirunelveli district. The findings indicated that students' interest in mathematics differed significantly based on gender and locality. The study highlighted the importance of considering demographic factors while understanding students' interest and achievement in mathematics.

Based on the above review of related studies, it was observed that mathematics achievement is influenced by various factors such as student engagement, attitude, interest, teaching methods, gender, and locality. However, limited studies have focused on the relationship between mathematics achievement, interest, and attitude among secondary school students in Vijayawada city, Andhra Pradesh. Therefore, the present study was undertaken to examine the achievement of secondary school students in mathematics in relation to their interest and attitude towards the subject.

Need and importance of the study:

Mathematics plays a significant role in developing mental discipline, logical reasoning, and systematic thinking among learners. It not only enhances analytical and problem-solving abilities but also provides a strong foundation for understanding various other disciplines, including science, social sciences, music, and arts. Mathematical knowledge enables individuals to approach situations logically, make informed decisions, and solve problems effectively in everyday life.

In the context of globalization, mathematics has become an essential tool for organizing and interpreting information. It promotes critical thinking, creativity, abstract reasoning, spatial understanding, problem-solving skills, and effective communication abilities. Academic achievement in general and mathematics achievement in particular are influenced not only by students' cognitive abilities but also by emotional, motivational, and attitudinal factors.

Therefore, students should be encouraged to recognize the importance, relevance, and practical applications of mathematics in their academic and personal lives. Developing mathematical competence, intrinsic interest, and a positive attitude towards learning mathematics is essential for improving achievement at the school level. The importance given to mathematics education across different cultures reflects its significance in both formal education and daily activities.

Hence, systematic research is necessary to understand the relationship among students' interest in mathematics, attitude towards mathematics, and achievement in mathematics. Such studies help educators develop effective teaching strategies and create learning environments that enhance students' motivation, confidence, and performance in mathematics.

Statement of the Problem:

The investigator proposed to take up this study, namely "*A Study of the performance of Secondary School children in relation to their Interest and Attitude towards Mathematics*".

Objectives of the study

The present study consists of below mentioned objectives:

1. To study the impact of the following variables on the achievement in mathematics of secondary school children.
 - Gender: Male / Female
 - Locality of living: Rural / Urban
 - Class studying: 8th class / 9th class
2. To study the impact of the following variables on the interest in mathematics of secondary school children
 - Gender: Male / Female
 - Locality of living : Rural / Urban
 - Class studying: 8th class / 9th class
3. To study the impact of the following variables on the attitude of secondary school children towards mathematics.
 - Gender: Male / Female
 - Locality of living : Rural / Urban
 - Class studying: 8th class / 9th class

Hypotheses of the Study

In order to achieve the forecasting objectives the following hypotheses were framed:

1. The following variables do not make a significant influence on the achievement in mathematics of secondary school children.
 - Gender: Male / Female
 - Locality of living : Rural / Urban
 - Class studying: 8th class / 9th class
2. The following variables do not make a significant influence on the interest in mathematics of secondary school children.
 - Gender: Male / Female
 - Locality of living : Rural / Urban
 - Class studying: 8th class / 9th class
3. The following variables do not make a significant influence on the attitude towards mathematics of secondary school children.

- Gender: Male / Female
- Locality of living : Rural / Urban
- Class studying: 8th class / 9th class

Method of research:

A survey method was followed in the present study. Survey research is a method of collecting and analyzing data obtained from a large number of respondents representing a specific population collected through highly structured and detailed questionnaires or interviews.

Population of the study:

The aim of this study was to evaluate secondary school students' performance in relation to their attitude toward an interest in mathematics. Consequently, secondary school students made up the study's population.

Sample of the study:

The sample consists of secondary school children studying in classes VIII and IX in Vijayawada city including rural and urban areas in the Krishna district of A.P.

Sampling Technique:

For the present study the investigator has taken up a stratified random sample of 30 secondary schools in and around Krishna district.

Research Tools Used:

Performance in mathematics:

In this research, the researcher took the achievement in mathematics marks obtained from the students of classes VIII and IX in their Formative-I for the academic year 2019-2020 as an indicator of their academic achievement in mathematics.

Mathematics interest inventory:

The Mathematics Interest Inventory was constructed and standardized by Dubey, L. N. (2004), and it was employed to collect data in this investigation. This inventory contains 40 items, including 20 positives and 20 negative items. The areas/dimensions-wise items among the distribution of these 40 items.

Attitude towards mathematics scale:

Attitude towards Mathematics Scale constructed and standardized by Sridevi. (2015) was used to collect data for the present research study. This scale consists of 50 items, of which 27 are positive

and 23 are negative. These statements fall into three categories i.e., cognitive, affective, and behavioral. The areas/dimensions-wise items among the distribution of these 50 items are not mentioned in the manual.

Data analysis & Interpretation

Objective 1: To study the impact of the following variables on the achievement mathematics secondary school children.

- Gender: Male / Female
- Locality of living : Rural / Urban
- Class studying: 8th class / 9th class

Table: 1 Variable wise distribution Mean, S.D. and C.R value for the achievement in mathematics of secondary school children.

S.. No	Variable	Type	N	Mean	S.D	C.R
1	Gender	Boys	407	48.85	15.38	2.22**
		Girls	408	46.50	15.02	
2	Locality of living	Rural	382	50.58	15.26	5.21***
		Urban	433	45.11	14.76	
3	Class studying	VIII	443	46.20	15.20	3.05***
		IX	372	49.43	15.10	

Significant at 0.05 level & *Significant at 0.01level

Interpretation

From the above table it can be inferred that Gender, Locality of living and Class studying makes a significant difference in secondary school children's achievement in mathematics. Hence the hypotheses was rejected.

Objective 2: To study the impact of the following variables on the interest in mathematics of secondary school children.

- Gender: Male / Female
- Locality of living : Rural / Urban
- Class studying: 8th class / 9th class

Table: 2 Variable wise distribution Mean, S.D. and C.R value for the interest in mathematics of secondary school children.

<i>S.. No</i>	<i>Variable</i>	<i>Type</i>	<i>N</i>	<i>Mean</i>	<i>S.D</i>	<i>C.R</i>
1	Gender	Boys	407	25.22	7.15	4.44***
		Girls	408	27.35	6.64	
2	Locality of living	Rural	382	25.54	7.30	2.86***
		Urban	433	26.94	6.61	
3	Class studying	VIII	443	26.65	7.10	1.63*
		IX	372	25.85	6.80	

*Not significant at 0.05 level

Significant at 0.05 level & *Significant at 0.01level

Interpretation

From the above table it can be inferred that Gender, Locality of living makes a significant difference in secondary school children's interest in mathematics. Hence the hypotheses was rejected. The class studying (8th class and 9th) by children of secondary schools makes no significant difference in their interest in mathematics. Hence the hypotheses was accepted.

Objective 3: To study the impact of the following variables on the attitude towards mathematics of secondary school children.

- Gender: Male / Female
- Locality of living : Rural / Urban
- Class studying: 8th class / 9th class

Table: 3 Variable wise distribution Mean, S.D. and C.R value for the attitude towards mathematics of secondary school children.

<i>S. No</i>	<i>Variable</i>	<i>Type</i>	<i>N</i>	<i>Mean</i>	<i>S.D</i>	<i>C.R</i>
1	Gender	Boys	407	173.71	28.10	3.18***
		Girls	408	179.62	25.07	
2	Locality of living	Rural	382	174.65	28.09	2.04**
		Urban	433	178.50	25.45	
3	Class studying	VIII	443	177.64	25.65	1.12*
		IX	372	175.52	27.92	

*Not significant at 0.05 level

Significant at 0.05 level & *Significant at 0.01level

Interpretation

From the above table it can be inferred that Gender, Locality of living makes a significant difference in secondary school children's interest in mathematics. Hence the hypotheses was rejected. The class studying (8th class and 9th) by children of secondary schools makes no significant difference in their interest in mathematics. Hence the hypotheses was accepted.

Major findings of the study:

The present study concluded that Gender, locality of living and class studying make a significant difference in secondary school children's achievement in mathematics. Boys have better achievement in mathematics than girl's children. The interesting finding is that secondary school children in living rural areas have better achievement in mathematics than children in living urban areas. Gender, locality of living make a significant difference in secondary school children's interest in mathematics. Class studying make no significant difference in the secondary school children's interest in mathematics. Therefore, it can be assumed that girls' children have more interest in mathematics compared to their counterparts. The another finding is that Gender, locality of living make a significant difference in the attitude of secondary school children towards mathematics. Class studying make no significant difference in the attitude of secondary school children towards mathematics.

Educational Implications

The findings of the study have several important implications for mathematics education. It is necessary to adopt individualized learning strategies and appropriate assessment methods to understand students' abilities accurately and to develop effective instructional programmes. Mathematics teaching should focus on creating genuine interest among students through age-appropriate, gender-sensitive, and activity-based learning approaches. In particular, play-way methods, mathematical games, puzzles, and practical activities can help students develop positive attitudes and enjoy the process of learning mathematics.

Teachers should emphasize the importance and practical applications of mathematics in daily life and motivate students to recognize the satisfaction and confidence gained through mathematical learning. While designing educational programmes, factors such as students' locality, class level, and individual differences should be given due consideration. This highlights the need for learner-

centered approaches that address the specific interests, abilities, and learning needs of each student rather than relying on uniform teaching strategies.

Therefore, traditional mass teaching methods should be supplemented with flexible and innovative approaches that provide opportunities for active participation, independent learning, collaborative activities, and meaningful mathematical experiences. Such approaches can enhance students' interest, improve their attitude towards mathematics, and contribute to better achievement.

Conclusion

Mathematics plays a significant role in the development of all disciplines and contributes directly or indirectly to scientific, technological, and social progress. It provides a systematic way of thinking and develops logical reasoning, analytical ability, accuracy, and problem-solving skills among learners. Students who study mathematics develop the ability to work systematically, think critically, and approach problems with confidence and precision.

Considering the importance of mathematics in education and everyday life, researchers and educators across the world continue to focus on improving the teaching and learning of mathematics. The present study helped the investigator understand the influence of students' interest and attitude towards mathematics on their achievement. The findings highlight the importance of individualizing instruction, improving assessment practices, and adopting age-appropriate and learner-friendly teaching methods.

The study emphasizes the need to develop gender-sensitive assessment tools, modernize teaching strategies, encourage play-way and activity-based learning, and provide greater opportunities for group activities and project-based learning. Giving adequate attention to individual differences and promoting learner-centered mathematics education can create a positive learning environment and improve students' achievement in mathematics. It is hoped that the present study will provide a foundation for further research and contribute to the improvement of mathematics education in the future.

References:

- Aiken, L. R. (2000). *Psychological Testing and Assessment (10th ed.)*. Boston, MA: Allyn and Bacon.
- Allport, G. W. (1935). *Attitudes*. In C. Murchison (Ed.), *Handbook of Social Psychology* (pp. 798–844). Worcester, MA: Clark University Press.

- Benjamin, E. W., & Murugaraju, P. (2021). *Achievement in Mathematics Among IX Standard Students in Trichy District*.
- Dubey, L. N. (2004). *Mathematics Interest Inventory. College of Educational Psychology and Guidance, Jabalpur: Agra Psychological Research Cell, Tiwari Kothi, Belanganj, Agra*.
- Garrett, H. E. (2006). *Statistics in Psychology and Education. Delhi: Surjeet Publications*.
- Good, C. V. (1959). *Dictionary of Education (5th ed.). Delhi: Prentice Hall of India*.
- Koul, Lokesh. (2007). *Methodology of Educational Research (3rd ed.). New Delhi: Vikas Publishing House Pvt. Ltd*.
- Lakshmi Karthika, S., & Suresh Kumar, T. (2018). *A study on Mathematics interest of higher secondary students in Tirunelveli district*. Indian Journal of Research, 7(7), 9–10.
- Maamin, M., Maat, S. M., & Iksan, Z. H. (2021). *The influence of student engagement on mathematical achievement among secondary school students*. Mathematics, 10(41), 1–14.
- Poudel, M. P. (2020). *Interest in Mathematics in the Ethnic Group of Nepal*. Global Scientific Journals, 8(8), 2336–2351.
- Sarmah, D., & Das, G. C. (2020). *An investigation of student's attitude towards learning Mathematics in a digital and traditional classroom: A study of secondary students in Guwahati city*. Turkish Journal of Computer and Mathematics Education, 11(3), 1016–1034.
- Sharma, R. A. (2006). *Advanced Statistics in Education and Psychology. Meerut, Uttar Pradesh: R. Lall Book Depot*.
- Shreedevi, T. (2015). *Effect of Mathematics Laboratory-Based Approach on Achievement, Attitude, and Anxiety of VII Standard Students in Mathematics. Unpublished Ph.D. Thesis, Department of Education, Regional Institute of Education, Mysore*.