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A STUDY OF THE RELATIONSHIP BETWEEN STUDENTS' ATTITUDE TOWARDS MATHEMATICS AND THEIR ACADEMIC ACHIEVEMENT IN MATHEMATICS

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ABSTRACT

Mathematics is an important subject in school education because it develops logical reasoning, analytical thinking, problem-solving skills, and the ability to make decisions systematically. However, students differ considerably in their attitudes towards mathematics and in their levels of academic achievement. Some students consider mathematics interesting, useful, and manageable, whereas others perceive it as difficult, abstract, or anxiety-provoking. These differences in attitude may influence students' classroom participation, motivation, persistence, study habits, and academic performance. Therefore, examining the relationship between students' attitudes towards mathematics and their academic achievement in mathematics is an important area of educational research.

The present study, entitled "A Study of the Relationship between Students' Attitude towards Mathematics and Their Academic Achievement in Mathematics," aims to examine the nature and extent of the relationship between students' mathematical attitudes and their achievement in the subject. It also seeks to understand the educational significance of students' interest, confidence, perceived usefulness of mathematics, and anxiety associated with learning mathematics. The study may further consider differences in attitudes across relevant student groups, depending on the objectives and design of the research.

The relationship between attitude and achievement may be influenced by several factors, including previous mathematical experiences, teaching methods, parental support, classroom environment, socioeconomic circumstances, and mathematics anxiety. Consequently, the relationship should be interpreted carefully, without assuming that a positive attitude necessarily causes higher achievement.

The study is expected to provide a useful framework for understanding the importance of students' attitudes in mathematics education. Its findings, when supported by empirical data, may help teachers, school administrators, parents, and curriculum planners develop strategies to improve students' confidence, interest, engagement, and learning outcomes in mathematics.

KEYWORDS: *Attitude towards Mathematics,Academic Achievement,Mathematics Anxiety,Mathematical Motivation,Secondary Education,Mathematics Learning.*

1.INTRODUCTION

Education plays a vital role in the intellectual, social, emotional, and professional development of individuals. Among the various subjects taught in schools, mathematics occupies a significant position because it develops logical reasoning, critical thinking, quantitative understanding, and systematic problem-solving abilities. Mathematics is also essential in everyday life, scientific research, technological advancement, commerce, engineering, economics, and numerous professional fields. Despite its importance, many students experience difficulties in learning mathematics, and their levels of interest, confidence, and achievement vary considerably.

Attitude towards mathematics is an important psychological and educational factor that may influence how students approach the subject. It refers to students' feelings, beliefs, interests, and evaluations concerning mathematics and the process of learning it. A positive attitude may include enjoyment of mathematical activities, confidence in solving problems, recognition of the usefulness of mathematics, and willingness to make efforts when difficulties arise. A negative attitude may involve fear, dislike, low confidence, avoidance of mathematical tasks, and the belief that mathematics is too difficult to understand. Academic achievement in mathematics refers to the level of knowledge, understanding, skills, and competencies demonstrated by students in the subject. It is commonly assessed through examination marks, achievement tests, classroom assessments, and other structured measures. Achievement depends on several interconnected factors, including prior knowledge, cognitive abilities, learning opportunities, teaching methods, motivation, attendance, family support, and the classroom environment.

The relationship between attitude towards mathematics and academic achievement has attracted considerable attention among educational researchers. Students who enjoy mathematics and believe they can succeed may be more willing to participate in classroom activities, practise mathematical problems, seek clarification, and persist when faced with challenging questions. Such behaviours may support learning and achievement. Conversely, students who experience mathematics anxiety or lack confidence may avoid practice, hesitate to ask questions, and develop gaps in their understanding. However, the relationship between attitude and achievement is not necessarily one-directional. Positive experiences and good examination results

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may strengthen students' confidence and interest in mathematics. Similarly, repeated difficulties or poor results may contribute to negative attitudes. Therefore, attitude and achievement may influence each other over time, while also being affected by other educational and personal factors.

The role of the mathematics teacher is particularly important in shaping students' learning experiences. Clear explanations, appropriate examples, practical activities, supportive feedback, and opportunities for collaborative learning can make mathematics more meaningful. Teachers can also help students understand that mathematical ability can improve through practice, effective strategies, and appropriate guidance. A classroom environment that treats mistakes as opportunities for learning may reduce fear and encourage participation.

Family attitudes, peer interactions, cultural expectations, and access to learning resources may also influence students' perceptions of mathematics. For example, repeated messages that mathematics is inherently difficult may discourage some learners, while encouragement and practical support may help them approach the subject with greater confidence. In the contemporary educational context, it is therefore important to examine how students' attitudes towards mathematics are associated with their academic achievement. Understanding this relationship may help educators identify learning difficulties, develop appropriate teaching strategies, and create supportive classroom environments.

The present study focuses on examining the relationship between students' attitudes towards mathematics and their academic achievement in mathematics. It seeks to establish a research-based understanding of this relationship and its implications for teaching, learning, and educational improvement. The study may also provide a foundation for further research into mathematics anxiety, motivation, self-confidence, and other factors associated with mathematical learning.

2.NEED AND SIGNIFICANCE OF THE STUDY

The study of students' attitudes towards mathematics and their academic achievement is important because mathematics learning involves not only intellectual ability but also motivation, confidence, interest, emotional responses, and learning experiences. Students with similar educational opportunities may demonstrate different levels of achievement, partly because they differ in how they perceive and approach the subject. Understanding this relationship may help educators develop more effective strategies for improving mathematics education.

2.1 Understanding Students' Attitudes towards Mathematics: Students may perceive mathematics as interesting and useful, or they may regard it as difficult and stressful. These perceptions can influence their willingness to engage with mathematical tasks. Studying students' attitudes helps identify whether they generally enjoy mathematics, feel confident in solving problems, recognise its practical relevance, or experience anxiety while learning it. This understanding can help teachers identify students who may need additional encouragement, learning support, or alternative instructional approaches.

2.2 Improving Academic Achievement: Academic achievement is an important indicator of students' learning progress. When students demonstrate a positive attitude towards mathematics, they may be more inclined to practise regularly, complete assignments, participate in classroom discussions, and persist in solving difficult problems. These behaviours may contribute to improved understanding and performance. However, positive attitudes alone cannot guarantee academic success. Students also require adequate mathematical knowledge, effective instruction, sufficient practice, and appropriate learning resources. Examining the relationship between attitude and achievement can help educators consider these factors together.

2.3 Identifying Mathematics Anxiety: Mathematics anxiety refers to feelings of tension, apprehension, or fear associated with mathematical activities. It may arise during classroom instruction, problem-solving exercises, homework, or examinations. Some students understand mathematical concepts but struggle to demonstrate their knowledge when anxiety becomes intense. Research into mathematical attitudes can help identify whether negative feelings and low confidence are associated with students' achievement. Teachers may then introduce supportive assessment practices, gradual problem-solving activities, and constructive feedback to help students manage their concerns.

2.4 Developing Confidence and Motivation: Confidence plays an important role in students' willingness to attempt challenging tasks. Students who believe that their mathematical abilities can improve may be more willing to practise and learn from mistakes. Studying attitudes can help teachers understand students' confidence levels and their motivation to learn mathematics. Teachers can encourage confidence by setting achievable goals, providing timely feedback, recognising improvement, and explaining difficult concepts through multiple methods. Such practices may support students' engagement and persistence.

2.5 Improving Teaching Methods: The effectiveness of mathematics teaching depends partly on how students respond to instructional methods. Some learners benefit from visual representations, practical activities, group discussions, mathematical games, or real-life examples. Others may require additional explanations and guided practice. Information about students' attitudes can help teachers reflect on whether their teaching methods encourage interest and understanding. The study may support the selection of teaching strategies that make mathematics more accessible and meaningful.

2.6 Understanding Individual Differences: Students differ in their previous learning experiences, language proficiency, mathematical preparation, socioeconomic circumstances, and access to educational support. These differences may influence both their attitudes and their academic performance. Examining the relationship between attitude and achievement may help

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educators recognise that poor performance should not automatically be interpreted as a lack of ability. It may indicate gaps in prior knowledge, anxiety, ineffective learning strategies, or insufficient opportunities to practise.

2.7 Supporting Curriculum Planning: Curriculum planners need to consider both the cognitive demands of mathematics and students' experiences of learning it. A curriculum that includes meaningful applications, gradual progression, problem-solving, collaborative tasks, and opportunities for independent thinking may help students develop a more constructive attitude towards the subject. Findings from attitude and achievement studies may inform curriculum development, classroom assessment, and the preparation of teaching-learning materials.

2.8 Helping Parents and Guardians: Parents and guardians influence children's educational experiences through encouragement, expectations, study routines, and attitudes towards school subjects. If adults repeatedly describe mathematics as extremely difficult or beyond a child's ability, students may adopt similar beliefs. Research findings can help parents understand the importance of supportive communication, regular practice, and constructive responses to mistakes. Parents can also encourage students to connect mathematics with everyday situations, such as budgeting, measuring, shopping, and interpreting information.

2.9 Promoting Educational Equity: Differences in mathematical achievement may reflect unequal access to qualified teachers, learning materials, technology, private tutoring, and supportive learning environments. Students from disadvantaged backgrounds may face additional barriers that affect both their attitudes and their performance. Studying these issues can encourage schools to identify students who require additional support. It can also help prevent negative stereotypes about gender, socioeconomic background, or perceived mathematical ability from influencing teaching expectations.

2.10 Providing a Basis for Further Research: The study can serve as a starting point for further investigations into mathematics anxiety, self-efficacy, teaching practices, gender-related differences, parental support, and the influence of digital learning resources. Researchers may also compare students across different classes, schools, educational boards, or geographical settings. Longitudinal and intervention-based studies could help establish how attitudes and achievement change over time.

In conclusion, the significance of the study lies in its potential to improve understanding of the psychological and educational factors associated with mathematics learning. When supported by reliable data, its findings may guide teachers, parents, administrators, and policymakers in creating more inclusive, motivating, and effective mathematics learning environments.

3. CONCEPT AND NATURE OF STUDENTS' ATTITUDE TOWARDS MATHEMATICS

Attitude towards mathematics is an important concept in educational psychology because it describes how students feel, think, and behave in relation to mathematics and its learning process. It includes students' interests, beliefs, confidence, emotional reactions, and perceptions of the value of mathematics. These attitudes may influence their classroom participation, willingness to practise, response to difficult problems, and expectations of success.

3.1 Meaning of Attitude towards Mathematics: An attitude towards mathematics can be understood as a relatively consistent tendency to evaluate mathematics positively or negatively. A student with a positive attitude may enjoy solving problems, feel interested in mathematical concepts, and believe that mathematics is useful in everyday life. A student with a negative attitude may feel uncomfortable during mathematics lessons, avoid mathematical tasks, or believe that the subject is too difficult. Attitudes are not necessarily permanent. They may change as a result of classroom experiences, examination performance, teacher feedback, parental expectations, peer interactions, and improvements in understanding.

3.2 Components of Mathematical Attitude

Students' attitudes towards mathematics can be examined through several related components.

1. Cognitive component: This refers to students' beliefs and perceptions about mathematics. For example, a student may believe that mathematics is useful for solving practical problems or that mathematical ability can improve with practice.
2. Affective component: This includes students' feelings and emotional responses towards mathematics, such as enjoyment, interest, fear, frustration, or confidence.
3. Behavioural component: This concerns students' tendencies to act in particular ways, such as participating in lessons, completing assignments, practising regularly, or avoiding difficult problems.

These components are interrelated, but they do not always correspond perfectly. A student may recognise the importance of mathematics while still feeling anxious about examinations.

3.3 Interest in Mathematics: Interest refers to the attention and engagement students show towards mathematical concepts and activities. Students who find lessons meaningful may be more willing to participate in discussions and attempt challenging exercises. Teachers can encourage interest by using practical examples, puzzles, games, patterns, and real-life applications.

3.4 Confidence and Self-Efficacy: Mathematics self-efficacy refers to students' beliefs about their ability to perform specific mathematical tasks successfully. Students with stronger self-efficacy may be more likely to attempt difficult problems and continue working after making mistakes.

Confidence should not be confused with actual achievement. A student may feel confident but have gaps in mathematical

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understanding, while another may possess strong skills but underestimate their ability.

3.5 Perceived Usefulness of Mathematics: Students may develop a more favourable attitude when they understand how mathematics is used in daily life and future careers. Examples include calculating expenses, interpreting statistics, measuring quantities, understanding interest rates, and analysing scientific information. Connecting mathematical concepts with practical situations can help students recognise the relevance of the subject.

3.6 Mathematics Anxiety: Mathematics anxiety involves apprehension or tension associated with mathematical tasks. It may affect concentration, working memory, confidence, and performance, particularly in stressful situations. Supportive instruction and low-pressure practice opportunities may help students approach mathematics more positively.

3.7 Academic Achievement in Mathematics: Academic achievement refers to the knowledge and skills students demonstrate in mathematics. It may be measured through examination scores, standardised achievement tests, classroom assessments, or carefully designed diagnostic tests.A reliable study should define achievement clearly and use a consistent measure for all participating students. Examination scores can provide useful information, but they may also be influenced by examination conditions, assessment difficulty, and differences in curriculum coverage.

3.8 Relationship between Attitude and Achievement: Attitude and achievement may be associated in several ways. A positive attitude may encourage effort and persistence, which can support learning. Successful learning experiences may also strengthen confidence and interest. Conversely, repeated academic difficulties may contribute to frustration and avoidance. Therefore, the relationship should be studied as a potentially reciprocal association influenced by multiple factors rather than as a simple cause-and-effect relationship.

4. MAJOR FACTORS AND DIMENSIONS ASSOCIATED WITH MATHEMATICAL ATTITUDE AND ACADEMIC ACHIEVEMENT

Students' attitudes towards mathematics and their academic achievement are shaped by a combination of psychological, instructional, family-related, social, and institutional factors. Understanding these factors is necessary for interpreting the relationship between attitude and achievement accurately.

4.1 Interest and Enjoyment: Interest is one of the important dimensions of mathematical attitude. Students who enjoy mathematical activities may be more willing to engage with new concepts, practise problem-solving, and participate in classroom discussions. Teachers can encourage interest through puzzles, mathematical games, practical demonstrations, group activities, and connections with everyday life. However, interest may differ across topics; a student who enjoys geometry may find algebra less engaging.

4.2 Motivation to Learn Mathematics: Motivation refers to the factors that initiate and sustain students' learning efforts. Intrinsic motivation arises when students find mathematics interesting or satisfying, while extrinsic motivation may involve marks, rewards, parental expectations, or future career opportunities. Both forms of motivation can influence learning behaviour. Nevertheless, long-term learning is more likely to be supported when students develop understanding, personal goals, and a sense of progress rather than depending exclusively on external rewards.

4.3 Self-Confidence and Self-Efficacy: Students' beliefs about their mathematical abilities can influence their choice of tasks, effort, and persistence. Learners who believe they can improve may be more willing to attempt challenging questions and learn from errors. Teachers can support self-efficacy by breaking complex problems into manageable steps, demonstrating different solution strategies, and providing specific feedback. Confidence should be developed alongside mathematical competence rather than through praise alone.

4.4 Mathematics Anxiety: Anxiety may arise from timed examinations, fear of making mistakes, negative past experiences, or pressure from teachers and family members. High anxiety can interfere with concentration and make it harder for students to demonstrate what they know. Supportive classroom relationships, opportunities for untimed practice, clear explanations, and constructive assessment can help reduce unnecessary pressure. Students experiencing persistent or severe anxiety may require additional individual support.

4.5 Teaching Methods and Teacher Behaviour: Teaching methods influence how students experience mathematics. Lessons that rely entirely on memorisation may be less engaging for students who need conceptual explanations or practical examples. Teachers can use demonstrations, visual representations, guided discovery, peer learning, mathematical discussion, and real-life problem-solving. Patient explanations and respectful treatment of mistakes may encourage students to ask questions and participate more actively.

4.6 Prior Knowledge and Learning Difficulties: Mathematics is cumulative: many advanced concepts depend on earlier knowledge. Difficulties with number operations, fractions, algebraic expressions, or basic arithmetic may create barriers to learning subsequent topics. Students who lack foundational knowledge may develop negative attitudes after repeated unsuccessful experiences. Diagnostic assessments, remedial instruction, and differentiated teaching can help identify and address these gaps.

4.7 Family Environment and Parental Support: Parents can influence students' mathematical experiences through encouragement, expectations, access to learning materials, and

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assistance with study routines. Supportive parents may help students practise regularly and view mistakes as part of learning. On the other hand, excessive pressure, negative comments about mathematics, or unrealistic expectations may increase anxiety. Schools can guide parents towards constructive ways of supporting mathematical learning.

4.8 Peer Influence and Classroom Climate: Classmates can affect students' confidence and participation. Collaborative problem-solving may provide opportunities to exchange ideas, explain concepts, and learn from others. However, ridicule, unhealthy competition, or comparisons of marks can discourage some learners. A positive classroom climate should encourage respectful discussion, diverse solution methods, and participation without fear of humiliation.

4.9 Socioeconomic and Educational Resources: Access to textbooks, digital resources, qualified teachers, additional instruction, and a suitable study environment may influence achievement. Students with limited access to such resources may experience difficulties that cannot be explained by their attitudes alone. Research should therefore consider relevant background variables when interpreting the relationship between attitude and achievement.

4.10 Gender and Social Expectations: Social beliefs about who is naturally good at mathematics can influence students' confidence and educational choices. Such beliefs should not be treated as evidence of inherent differences in mathematical ability. Researchers may examine whether attitudes and achievement differ across gender groups, but any differences should be interpreted in relation to educational opportunities, social expectations, previous experiences, and other relevant factors.

4.11 Assessment Practices: Frequent high-pressure testing may influence students' emotional responses to mathematics. Assessment that provides useful feedback and identifies specific learning gaps can instead support improvement. Teachers should combine appropriate written examinations with classroom activities, diagnostic exercises, and opportunities for students to correct mistakes.

4.12 Curriculum and Real-Life Applications: A curriculum that connects mathematical concepts with practical situations may help students understand the purpose of what they learn. Examples from finance, science, technology, sports, and everyday decision-making can demonstrate the usefulness of mathematical knowledge. In summary, students' mathematical attitudes and achievement should be understood within a broad educational context. Effective interventions are more likely to succeed when they address emotional, instructional, cognitive, and environmental factors together.

5. RELATIONSHIP BETWEEN STUDENTS' ATTITUDE TOWARDS MATHEMATICS AND ACADEMIC ACHIEVEMENT

The relationship between students' attitudes towards mathematics and their academic achievement is an important issue in educational research. Attitude may influence students' motivation, engagement, and persistence, while academic experiences may also shape their attitudes. Examining this relationship can help teachers understand the factors associated with successful mathematics learning.

5.1 Positive Attitude and Academic Achievement: Students with a positive attitude towards mathematics may be more willing to participate in classroom activities, complete assignments, practise regularly, and seek help when they encounter difficulties. These learning behaviours can support the development of mathematical understanding and may be associated with higher achievement. For example, a student who enjoys solving mathematical problems may spend additional time exploring different solution methods. Through repeated practice and feedback, the student may strengthen conceptual understanding and improve examination performance.

5.2 Negative Attitude and Academic Difficulties: Students who perceive mathematics as difficult or experience considerable anxiety may avoid mathematical tasks, participate less frequently, or give up when problems become challenging. Reduced engagement may limit opportunities for practice and feedback. However, a negative attitude does not necessarily mean that a student lacks mathematical ability. The student may have experienced ineffective teaching, gaps in prior knowledge, examination pressure, or repeated discouragement. These factors should be examined before drawing conclusions about the student's potential.

5.3 Reciprocal Relationship: The relationship between attitude and achievement may operate in both directions. Positive attitudes can encourage productive learning behaviours, and successful performance may strengthen confidence and interest. Conversely, repeated unsuccessful experiences may weaken confidence, while negative attitudes may discourage the practice required for improvement. This reciprocal relationship suggests that teachers should address both students' mathematical understanding and their emotional experiences of learning.

5.4 Role of Teachers and Learning Environment: Teachers can influence this relationship by providing clear explanations, appropriate challenges, constructive feedback, and opportunities for active participation. A classroom where students can ask questions and learn from mistakes may encourage a more positive attitude. Practical activities, collaborative problem-solving, mathematical games, and real-life examples can also help students connect mathematical concepts with meaningful experiences.

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5.5 Empirical Investigation of the Relationship: A descriptive-correlational study can examine whether students with more favourable attitudes tend to achieve higher mathematics scores. The researcher may administer a validated mathematics attitude scale and obtain students' mathematics marks from a clearly defined assessment. The Pearson product-moment correlation coefficient may be used when its assumptions are reasonably satisfied; Spearman's rank correlation may be appropriate for ordinal data or certain situations where Pearson correlation is unsuitable.

Thus, examining the relationship between mathematical attitude and academic achievement can provide useful evidence for improving mathematics teaching. The ultimate aim is to create learning environments in which students develop both mathematical competence and the confidence to engage with the subject.

6. CHALLENGES IN STUDYING STUDENTS' MATHEMATICAL ATTITUDES AND ACADEMIC ACHIEVEMENT

Research into students' attitudes towards mathematics and their academic achievement involves several methodological and practical challenges. Identifying these challenges is essential for ensuring that the findings are reliable, meaningful, and useful for educational practice.

6.1 Measuring Attitude Accurately: Attitude is a psychological construct that cannot be observed directly in the same way as an examination score. Researchers usually measure it through questionnaires, rating scales, or interviews.

Students may interpret questionnaire statements differently, and their responses may be influenced by mood, recent experiences, or a desire to provide socially acceptable answers. Therefore, the researcher should use an appropriate instrument with evidence of validity and reliability for the target population.

6.2 Defining Academic Achievement: Academic achievement can be measured using school examination marks, standardised tests, classroom assessments, or diagnostic tests. These measures may assess different skills and levels of difficulty. For example, students' scores from examinations conducted by different schools may not be directly comparable. Researchers should define the achievement measure clearly and, where possible, use a common assessment or comparable records.

6.3 Establishing the Direction of the Relationship: One major challenge is determining whether attitude influences achievement, achievement influences attitude, or both are influenced by other factors. A one-time correlational study can identify an association but cannot establish the direction of causation. Longitudinal studies, repeated assessments, and carefully designed intervention studies may provide stronger evidence about how the relationship develops over time.

6.4 Influence of External Variables: Students' mathematical attitudes and achievement may be affected by prior knowledge, attendance, teacher effectiveness, family support, access to tutoring, language proficiency, and socioeconomic circumstances. If these variables are not considered, researchers may overestimate or underestimate the relationship between attitude and achievement. Appropriate statistical controls and careful research design can help address this issue.

6.5 Sampling and Representation: A study conducted in one school or a small group of students may not represent students from other schools, regions, or educational backgrounds. Researchers should define the target population, select a suitable sample, explain the sampling procedure, and report the limitations of generalising the findings. Where possible, a sufficiently diverse sample should be used.

6.6 Cultural and Linguistic Differences: Attitude questionnaires may contain statements that are difficult for some students to understand because of language differences or unfamiliar terminology. Directly translating a scale may not preserve the intended meaning of every item. Researchers should use language appropriate to participants' age and educational background and, where necessary, pilot-test the instrument before the main study.

6.7 Social Desirability and Response Bias: Students may report that they enjoy mathematics because they believe teachers expect such an answer. Others may understate their confidence because they fear being judged by classmates. Confidential responses, clear instructions, and a non-judgmental administration process can help reduce these problems. Students should understand that their questionnaire responses will not affect their examination marks.

6.8 Time and Resource Limitations: Collecting data from schools may require permission, coordination with teachers, scheduling, and access to academic records. Limited time and resources may restrict the number of schools or students included. Planning the study carefully and using appropriate instruments can make data collection more manageable without compromising essential research standards.

6.9 Statistical Interpretation: Researchers must select statistical techniques appropriate to the data and study design. Incorrect interpretation of correlation coefficients, statistical significance, or group differences may lead to misleading conclusions. Results should include relevant descriptive statistics and, where appropriate, effect sizes and confidence intervals. Findings should be explained in educationally meaningful terms rather than relying only on whether a result is statistically significant.

6.10 Ethical Considerations: Research involving school students requires appropriate institutional permission, informed consent and assent as applicable, protection of personal information, and voluntary participation. Academic records

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should be accessed only with proper authorisation. Researchers should avoid labelling students as weak or incapable based on their attitudes or marks. Findings should be used to understand learning needs and improve educational support. In conclusion, careful measurement, suitable sampling, appropriate statistical analysis, ethical data collection, and transparent reporting are essential for producing credible findings about the relationship between students' attitudes towards mathematics and their academic achievement.

7. SUGGESTIONS FOR IMPROVING STUDENTS' ATTITUDES AND ACADEMIC ACHIEVEMENT IN MATHEMATICS

Improving students' attitudes towards mathematics requires coordinated efforts by teachers, parents, school administrators, and curriculum planners. The following suggestions may help create a supportive learning environment and improve students' engagement with mathematics.

1. Use activity-based teaching methods. Mathematics should be taught through practical activities, mathematical games, puzzles, demonstrations, models, and problem-solving exercises. These methods can help students connect abstract concepts with concrete experiences.
2. Connect mathematics with everyday life. Teachers should explain the practical applications of mathematics in shopping, budgeting, banking, construction, measurement, sports, and technology. Real-life examples can help students recognise the usefulness of mathematical knowledge.
3. Reduce unnecessary mathematics anxiety. Teachers should avoid humiliating students for incorrect answers or slow progress. They should encourage questions, provide opportunities for untimed practice, and treat mistakes as opportunities to understand mathematical concepts more deeply.
4. Strengthen foundational knowledge. Students who experience difficulties with basic arithmetic, fractions, decimals, or algebra may require additional support before progressing to more complex concepts. Diagnostic assessments and remedial teaching can help identify and address learning gaps.
5. Develop students' mathematical confidence. Teachers should set achievable learning goals, recognise individual improvement, and provide specific feedback. Students should be encouraged to understand that mathematical competence can develop through regular practice and effective learning strategies.
6. Encourage collaborative learning. Group activities and peer discussions can help students explain their reasoning, compare different solution methods, and learn from one another. Teachers should ensure that all students participate and that weaker learners are not excluded.
7. Adopt learner-centred teaching strategies. Teachers should consider differences in students' prior knowledge, learning pace, interests, and language proficiency. Visual representations, practical examples, guided practice, and differentiated tasks can help address these differences.
8. Improve assessment and feedback. Assessment should identify students' strengths and specific learning difficulties rather than merely assigning marks. Teachers should provide timely feedback, explain errors, and offer opportunities for correction and improvement.
9. Strengthen parental involvement. Parents should encourage regular study habits, provide a supportive learning environment, and avoid negative statements about mathematics. They can also help children practise mathematical skills through everyday activities.
10. Use educational technology appropriately. Interactive applications, digital visualisations, and online practice exercises can help students explore mathematical concepts. Technology should complement effective teaching rather than replace teacher guidance or foundational practice.
11. Provide professional development for teachers. Training programmes should focus on conceptual teaching, mathematics anxiety, formative assessment, inclusive education, and the effective use of digital resources.
12. Conduct regular research and evaluation. Schools should periodically examine students' attitudes, achievement patterns, and learning difficulties. Researchers may evaluate the effectiveness of teaching interventions by collecting data before and after their implementation.

The implementation of these suggestions should be adapted to the age, needs, educational context, and available resources of students. A balanced approach that combines conceptual understanding, emotional support, effective teaching, and regular practice can help students develop a more constructive attitude towards mathematics and improve their learning outcomes.

8. CONCLUSION

The present research paper, entitled "A Study of the Relationship between Students' Attitude towards Mathematics and Their Academic Achievement in Mathematics," examines the educational significance of students' attitudes and their possible association with academic performance. Mathematics is an essential subject that contributes to logical reasoning, analytical thinking, quantitative understanding, and problem-solving. However, students' experiences of learning mathematics differ according to their interests, confidence, motivation, previous learning experiences, and emotional responses.

The study therefore highlights the importance of examining students' mathematical attitudes alongside their academic performance rather than considering examination marks in isolation. Teachers should create supportive classroom environments in which students can ask questions, express difficulties, learn from mistakes, and develop their mathematical understanding without unnecessary fear or embarrassment.

Activity-based teaching, real-life examples, collaborative learning, constructive feedback, remedial support, and appropriate educational technology may help make mathematics more accessible and engaging. Parents and school administrators also have important roles in encouraging students and ensuring access to suitable learning opportunities.

It is important to note that the present paper provides a conceptual and literature-based discussion of the research problem. No original student data have been collected or statistically analysed for this paper. Consequently, no specific

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correlation coefficient, statistically significant relationship, or empirical conclusion about the participating students can be reported at this stage. Such conclusions would require a systematic investigation using appropriate research instruments and actual academic achievement data.

Future researchers may conduct descriptive-correlational studies involving students from different schools and educational backgrounds. Longitudinal research may also help clarify how attitudes and achievement influence one another over time.

In conclusion, understanding students' attitudes towards mathematics can contribute to the development of more effective and learner-centred mathematics education. By combining positive learning experiences with strong conceptual instruction and appropriate academic support, educational institutions can work towards improving students' confidence, engagement, and achievement in mathematics.

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