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# Attitude towards Mathematics and Science in Relation to STEM Career Aspirations among Senior Secondary School Students

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## ABSTRACT

The present study aimed to examine the attitudes of senior secondary school students towards Mathematics and Science and investigate their relationship with STEM career aspirations in District Baramulla, Jammu and Kashmir. The study also sought to determine whether gender differences exist in students' attitudes and career aspirations. The study adopted a descriptive survey design. A sample of 120 senior secondary school students (Classes XI and XII) was selected from four Government Higher Secondary Schools in District Baramulla using simple random sampling. Data were collected through a structured questionnaire comprising items on attitudes towards Mathematics, attitudes towards Science, and STEM career aspirations. The collected data were analysed using Statistical Package for the Social Sciences (SPSS, Version 26). Descriptive statistics (mean and standard deviation) were used to assess students' attitudes and career aspirations, while Pearson's Product Moment Correlation was employed to examine the relationship between attitudes and STEM career aspirations. Independent samples *t*-tests were conducted to determine gender differences. Statistical significance was tested at the 0.05 level. The findings revealed that students possessed moderately positive attitudes towards Mathematics ($M = 3.74$, $SD = 0.61$) and Science ($M = 3.89$, $SD = 0.58$), along with moderately high STEM career aspirations ($M = 3.68$, $SD = 0.72$). A significant positive relationship was found between attitudes towards Mathematics and STEM career aspirations ($r = 0.592$, $p < 0.001$), as well as between attitudes towards Science and STEM career aspirations ($r = 0.664$, $p < 0.001$). The study found no statistically significant gender differences in attitudes towards Mathematics and Science or in STEM career aspirations. The study concludes that positive attitudes towards Mathematics and Science play a significant role in fostering students' aspirations for STEM careers. Strengthening learner-centred pedagogy, laboratory experiences, teacher support, and career guidance programmes can enhance students' interest in STEM disciplines. The findings provide preliminary empirical evidence from District Baramulla and offer useful implications for educators, school administrators, curriculum planners, and policymakers in promoting STEM education and informed career decision-making.

**Keywords:** Attitude, Mathematics, Science, Career Aspirations, STEM Education, Senior Secondary Students, Baramulla, Jammu and Kashmir.

## INTRODUCTION

Education is widely acknowledged as a fundamental instrument for individual empowerment, social transformation, and national development. In the twenty-first century, rapid advancements in science, technology, engineering, and innovation have transformed labour markets and increased the demand for a workforce equipped with scientific knowledge, analytical reasoning, and problem-solving abilities. Mathematics and Science, therefore, occupy a central position within school education because they not only develop logical thinking and scientific literacy but also prepare learners for participation in knowledge-based economies **(OECD, 2019).** Consequently, students' attitudes towards these subjects have emerged as an important area of educational research, as these attitudes substantially influence learning behaviour, academic achievement, and career decision-making.

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Attitude is generally understood as a learned predisposition to respond favourably or unfavorably towards a particular object, person, idea, or activity **(Ajzen, 1991).** Within educational settings, students' attitudes towards Mathematics and Science encompass their beliefs, emotions, interests, values, confidence, and willingness to engage with these subjects. Positive attitudes often manifest through curiosity, enjoyment, confidence, persistence, and active participation in classroom learning, whereas negative attitudes are reflected in anxiety, fear, avoidance, and low motivation **(Bandura, 1997).** Research has consistently demonstrated that students possessing favourable attitudes towards Mathematics and Science tend to achieve higher academic performance and are more likely to select advanced courses and careers related to STEM disciplines **(Eccles & Wigfield, 2020).** The importance of students' attitudes extends beyond classroom achievement because these attitudes influence educational aspirations and occupational choices. Career aspirations refer to individuals' ambitions, expectations, and long-term goals regarding their future professions. They develop gradually through interactions among personal interests, perceived abilities, family influences, peer groups, school experiences, and broader socio-economic conditions **(Lent, Brown, & Hackett, 1994).** Adolescence, particularly the senior secondary stage, represents a critical period during which students begin making decisions regarding higher education and future careers. Therefore, understanding the factors that shape career aspirations during this stage is essential for promoting informed educational and occupational choices.

Mathematics and Science education has gained renewed significance in India following the implementation of the National Education Policy (NEP) 2020, which advocates experiential learning, multidisciplinary education, critical thinking, scientific temper, and enhanced career guidance. The policy emphasizes the development of twenty-first-century competencies while encouraging students to explore diverse educational pathways based on their interests and aptitudes **(Government of India, 2020).** Furthermore, the policy promotes integration between academic learning and vocational education, thereby broadening career opportunities for learners. Achieving these objectives requires students to develop positive attitudes towards Mathematics and Science because attitudes strongly influence their willingness to pursue higher education and careers in STEM-related fields.

From a theoretical perspective, the relationship between attitudes and career aspirations can be understood through several complementary frameworks. Expectancy-Value Theory proposes that students' educational choices are determined by their expectations of success and the value they assign to learning tasks **(Eccles & Wigfield, 2020).** Students who believe they can succeed in Mathematics and Science and perceive these subjects as valuable are more likely to pursue advanced study and STEM careers. Similarly, Social Cognitive Career Theory emphasizes the central role of self-efficacy beliefs, outcome expectations, and contextual supports in shaping educational and occupational decisions **(Lent et al., 1994).** The Theory of Planned Behavior further explains that attitudes, subjective norms, and perceived behavioural control jointly predict behavioural intentions, including career choices **(Ajzen, 1991).** Collectively, these theories suggest that positive attitudes towards Mathematics and Science are likely to enhance students' aspirations for careers requiring scientific knowledge and quantitative reasoning.

**Attitude towards Mathematics and Science**

Attitude is a multidimensional psychological construct comprising cognitive, affective, and behavioural components that collectively influence an individual's response towards a particular object, activity, or phenomenon. In educational psychology, attitude refers to students' beliefs, emotions, interests, values, and behavioural tendencies towards academic subjects, which significantly affect their learning experiences and educational outcomes **(Ajzen, 1991).** Within the context of Mathematics and Science education, attitude encompasses students' perceptions regarding the usefulness of these subjects, their confidence in mastering concepts, enjoyment of learning activities, willingness to engage in problem-solving, and persistence when confronted with academic challenges. These dimensions together determine the extent to which students actively participate in learning and subsequently influence their academic achievement and career aspirations. Research over the past four decades has consistently demonstrated that positive attitudes towards Mathematics and Science are associated with higher academic achievement, greater self-confidence, enhanced motivation, and increased participation in STEM-related educational pathways **(Ma & Kishor, 1997).** Conversely, students who develop negative attitudes often exhibit avoidance behaviours, reduced classroom participation, lower academic

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performance, and reluctance to pursue careers requiring mathematical or scientific competence **(OECD, 2019).** Thus, attitudes function not merely as emotional responses but as significant determinants of educational engagement and long-term career development.

**Nature and Dimensions of Attitude**

Educational researchers generally conceptualize attitude towards Mathematics and Science as comprising three interrelated dimensions: cognitive, affective, and behavioural. The cognitive dimension refers to students' beliefs and perceptions about the importance, difficulty, and usefulness of Mathematics and Science. Students who perceive these subjects as meaningful and relevant to everyday life are more likely to invest greater effort in learning them. The affective dimension represents emotional responses such as enjoyment, anxiety, curiosity, or fear experienced during learning activities. Positive emotions facilitate deeper engagement and intrinsic motivation, whereas anxiety often impedes conceptual understanding and academic performance. The behavioural dimension reflects students' willingness to participate in classroom discussions, complete assignments, undertake laboratory activities, and pursue advanced learning opportunities. These dimensions operate simultaneously rather than independently. For instance, students who believe that Mathematics is valuable (cognitive), enjoy solving mathematical problems (affective), and willingly participate in classroom activities (behavioural) generally develop stronger academic competence than students possessing negative perceptions across these dimensions. Such interactions highlight the complexity of attitude formation and emphasize the importance of addressing cognitive beliefs, emotional experiences, and learning behaviours together.

**Development of Attitudes Towards Mathematics and Science**

Students' attitudes towards Mathematics and Science develop gradually through continuous interactions with their family, school, peers, teachers, and broader social environment. Early learning experiences often establish the foundation upon which later attitudes are built. Positive classroom experiences characterized by supportive teachers, engaging instructional methods, and opportunities for active participation encourage favourable attitudes. Conversely, repeated experiences of failure, excessive examination pressure, teacher-centered instruction, and negative classroom climates contribute to Mathematics anxiety and declining interest in Science. Bandura's (1997) theory of self-efficacy provides an important explanation for attitude development. According to Bandura, students who repeatedly experience academic success develop stronger beliefs in their capabilities, which enhance confidence, persistence, and intrinsic motivation. These beliefs subsequently strengthen positive attitudes towards learning. In contrast, repeated academic failures reduce self-efficacy, increase anxiety, and weaken students' willingness to engage with challenging academic tasks. Similarly, Eccles and Wigfield's Expectancy-Value Theory proposes that students' attitudes depend upon two major psychological judgments: their expectation of success and the value they attach to the **task (Eccles & Wigfield, 2020)**. Students are more likely to develop favourable attitudes when they believe they can succeed in Mathematics and Science and perceive these subjects as useful, enjoyable, and important for their future. Conversely, if students anticipate failure or fail to recognise the relevance of these disciplines, their motivation declines, resulting in less favourable attitudes and reduced academic engagement.

**Factors Influencing Attitudes Towards Mathematics and Science**

The literature identifies numerous personal, familial, institutional, and societal factors influencing students' attitudes towards Mathematics and Science. Among personal factors, academic self-efficacy, intrinsic motivation, prior achievement, interest, and learning styles play significant roles. Students possessing greater confidence in their abilities generally exhibit more favourable attitudes than those who doubt their competence **(Bandura, 1997).** Similarly, students who experience curiosity and enjoyment during learning activities are more likely to sustain positive attitudes over time. Teacher-related factors constitute another important influence. Teachers' instructional competence, pedagogical approaches, classroom management skills, communication styles, and expectations substantially shape students' perceptions of Mathematics and Science. Learner-centered pedagogies involving inquiry-based learning, collaborative problem-solving, project-based instruction, and laboratory activities have consistently been associated with improved attitudes and enhanced conceptual

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understanding **(UNESCO, 2021).** In contrast, excessive dependence on rote memorization, lecture-based teaching, and examination-oriented instruction often discourages students from developing genuine interest in scientific inquiry. Parental influence also plays a crucial role. Parents who encourage curiosity, support homework, discuss educational goals, and maintain positive expectations contribute significantly to the development of favourable attitudes. Their educational attainment, occupational background, and socio-economic status indirectly influence students' perceptions by determining access to educational resources, digital technologies, private tutoring, and enriching extracurricular experiences. Research has shown that parental expectations frequently influence students' confidence and educational aspirations, particularly during adolescence **(Eccles & Wigfield, 2020).** Peer relationships likewise shape attitudes through social comparison, collaborative learning, and shared academic norms. Students studying within academically supportive peer groups often demonstrate greater motivation and persistence than those surrounded by peers who devalue academic achievement. Contemporary educational research also recognizes the growing influence of digital technologies, online learning environments, educational applications, and virtual laboratories in promoting positive attitudes towards Mathematics and Science, particularly after the COVID-19 pandemic accelerated technology integration within schools.

**STEM Career Aspirations in the Indian Context**

India has witnessed a growing emphasis on STEM education due to its strategic importance for economic growth, technological innovation, and global competitiveness. The National Education Policy (Government of India, 2020) recognizes the need to cultivate scientific temper, creativity, critical thinking, and multidisciplinary learning while strengthening career guidance at the secondary level. The policy encourages experiential learning, flexibility in subject selection, and integration between academic and vocational education to enable students to make informed career decisions.

Despite these policy initiatives, challenges remain. Many students continue to perceive Mathematics and Science as difficult, examination-oriented subjects rather than opportunities for creativity and innovation. High levels of academic competition, coaching culture, limited laboratory infrastructure in some schools, and insufficient career counselling restrict students' understanding of the diverse career pathways available through STEM education. Consequently, many capable students either underestimate their potential or select careers based primarily on external pressures rather than personal interests and competencies. These challenges are particularly relevant in Jammu and Kashmir, where educational development has improved considerably during the past decade but continues to face contextual constraints such as geographical diversity, uneven distribution of educational resources, and disparities between rural and urban schools. District Baramulla, with its mix of urban, semi-urban, and rural educational institutions, provides an appropriate context for examining how students' attitudes towards Mathematics and Science shape their career aspirations within these varying educational environments.

**Rationale of The Study**

Despite national efforts to strengthen STEM education, several challenges continue to affect students' participation in Mathematics and Science. Studies have identified Mathematics anxiety, perceived difficulty of scientific concepts, inadequate laboratory facilities, traditional teacher-centered pedagogy, examination pressure, gender stereotypes, and limited awareness of career opportunities as important barriers to developing favourable attitudes **(OECD, 2019; UNESCO, 2021**). These challenges become even more significant in geographically diverse and educationally developing regions such as Jammu and Kashmir, where disparities in infrastructure, accessibility, socio-economic conditions, and educational resources may influence students' learning experiences and aspirations.

District Baramulla, situated in the northern part of Jammu and Kashmir, presents a distinctive educational context characterized by a combination of urban, semi-urban, and rural schools. Students studying in this district experience diverse educational environments shaped by differences in school infrastructure, teacher availability, parental educational background, socio-economic status, and access to digital learning resources. While recent educational reforms have improved enrolment and infrastructure, comparatively little research has examined how these contextual factors influence students' attitudes towards Mathematics and Science and how such

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attitudes subsequently affect their career aspirations. Most Indian studies investigating attitudes towards STEM subjects have been conducted in metropolitan or economically developed states, thereby limiting the applicability of their findings to the unique socio-cultural and educational realities of Jammu and Kashmir The existing body of research consistently demonstrates positive associations between favourable attitudes towards Mathematics and Science, academic achievement, self-efficacy, motivation, and STEM career intentions. Nevertheless, there remains a noticeable scarcity of research examining these relationships within the specific socio-cultural context of Jammu and Kashmir. Given the strategic importance of promoting STEM education for sustainable development, there is an urgent need to understand how students in District Baramulla perceive Mathematics and Science and how these perceptions influence their future educational and occupational aspirations.

### Objectives Of The Study

1. To examine the attitude of senior secondary school students towards Mathematics and Science in District Baramulla.
2. To assess the level of STEM career aspirations among senior secondary school students.
3. To investigate the relationship between students' attitudes towards Mathematics and Science and their career aspirations.
4. To examine gender differences in attitudes towards Mathematics and Science and STEM career aspirations among senior secondary school students.

### Research Hypotheses

**$H_0$1 =** There is no significant relationship between students' attitude towards Mathematics and their STEM career aspirations.

**$H_1$1 =** There is a significant positive relationship between students' attitude towards Mathematics and their STEM career aspirations.

**$H_0$2 =** There is no significant relationship between students' attitude towards Science and their STEM career aspirations.

**$H_1$2** = There is a significant positive relationship between students' attitude towards Science and their STEM career aspirations.

**$H_0$3 =** There is no significant difference between male and female senior secondary school students in their attitudes towards Mathematics and Science.

**$H_1$3 =** There is a significant difference between male and female senior secondary school students in their attitudes towards Mathematics and Science.

**$H_0$4 =** There is no significant difference between male and female senior secondary school students in their STEM career aspirations.

**$H_1$4 =** There is a significant difference between male and female senior secondary school students in their STEM career aspirations.

## METHODOLOGY

## Research Design

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The study adopted a **descriptive survey design** to obtain preliminary empirical evidence on the attitudes of senior secondary school students towards Mathematics and Science and their career aspirations. A quantitative approach was employed using a structured questionnaire based on a five-point Likert scale. The study was conducted among 120 senior secondary school students (Class XI and XII) selected from four Government Higher Secondary Schools in District Baramulla, Jammu and Kashmir. The participants were selected through Simple Random Sampling, ensuring that each student had an equal probability of being included in the study.

**Sampling Frame**

| S. No. | Name of School | Class XI Population | Class XII Population | Total Population | Sample Selected |
|---|---|---|---|---|---|
| 1 | Government Higher Secondary School Doabgah, Sopore | 110 | 95 | 205 | 30 |
| 2 | Government Higher Secondary School Shutloo, Baramulla | 98 | 92 | 190 | 30 |
| 3 | Government Higher Secondary School Hadipora, Rafiabad | 120 | 100 | 220 | 30 |
| 4 | Government Town Higher Secondary School Baramulla | 105 | 80 | 185 | 30 |
| **Total** | **4 Schools** | **433** | **367** | **800** | **120** |

**Data Collection Tools and techniques**

Data were collected using a self-developed structured questionnaire consisting of three sections**: demographic information, attitude towards Mathematics and Science, and career aspirations**. Prior to the main survey, the instrument was reviewed by experts in education to establish content validity, and a pilot test was conducted to ensure clarity and reliability. The collected data were coded and analyzed using SPSS (Version 26). Descriptive statistics, including frequency, percentage, mean, and standard deviation, were used to describe students' attitudes and career aspirations. Pearson's Product Moment Correlation was employed to examine the relationship between attitudes towards Mathematics and Science and career aspirations, while the Independent Samples t-test was used to determine gender differences in attitudes and career aspirations. Statistical significance was tested at the 0.05 level.

**Analysis And Interpretation Of Data**

**Hypothesis 1**

**$H_0$1:** There is no significant relationship between students' attitude towards Mathematics and their STEM career aspirations.

**Table 1:- Correlation between Attitude towards Mathematics and STEM Career Aspirations (N = 120)**

| Variables | N | Pearson's r | p-value | Decision |
|---|---|---|---|---|
| Mathematics Attitude × STEM Career Aspirations | 120 | 0.592 | 0.000 | Reject $H_0$1 |

**Interpretation:-** The Pearson correlation coefficient between students' attitude towards Mathematics and STEM career aspirations was **r = 0.592**, which indicates a **moderate positive relationship**. The relationship was statistically significant (**p < 0.001**). Therefore, the null hypothesis ($H_{01}$) was rejected. It may be inferred that students with more positive attitudes towards Mathematics tend to exhibit higher aspirations for STEM-related careers.

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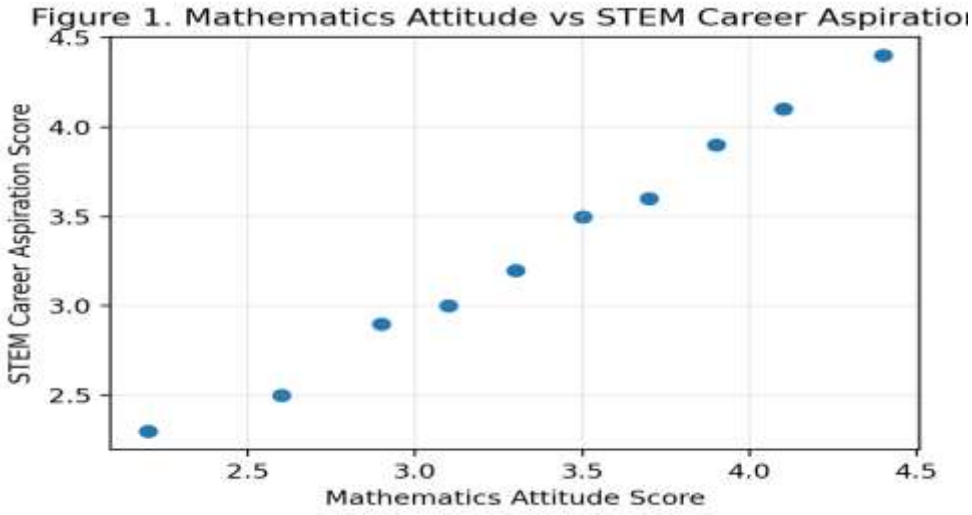


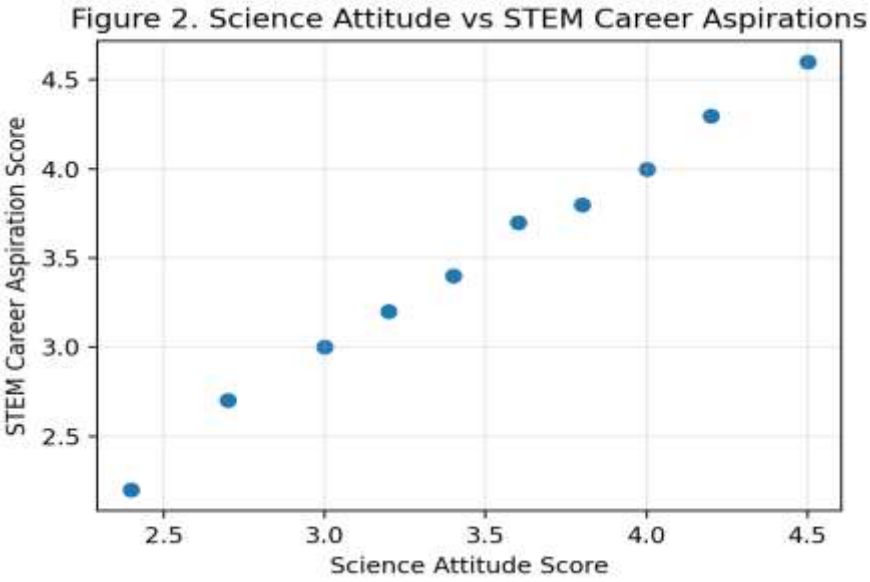

**Hypothesis 2**

**$H_o2$:** There is no significant relationship between students' attitude towards Science and their STEM career aspirations.

**Table 2 :- Correlation between Attitude towards Science and STEM Career Aspirations (N = 120)**

| Variables | N | Pearson's r | p-value | Decision |
|---|---|---|---|---|
| Science Attitude × STEM Career Aspirations | 120 | 0.664 | 0.000 | Reject $H_o2$ |

**Interpretation:-** The correlation analysis revealed a statistically significant positive relationship between attitude towards Science and STEM career aspirations (**$r = 0.664$, $p < 0.001$**). Consequently, the null hypothesis ($H_{o2}$) was rejected. The findings suggest that students with favourable attitudes towards Science are more likely to aspire to STEM careers.




**Hypothesis 3**

**$H_o3$:** There is no significant difference between male and female senior secondary school students in their attitudes towards Mathematics and Science.

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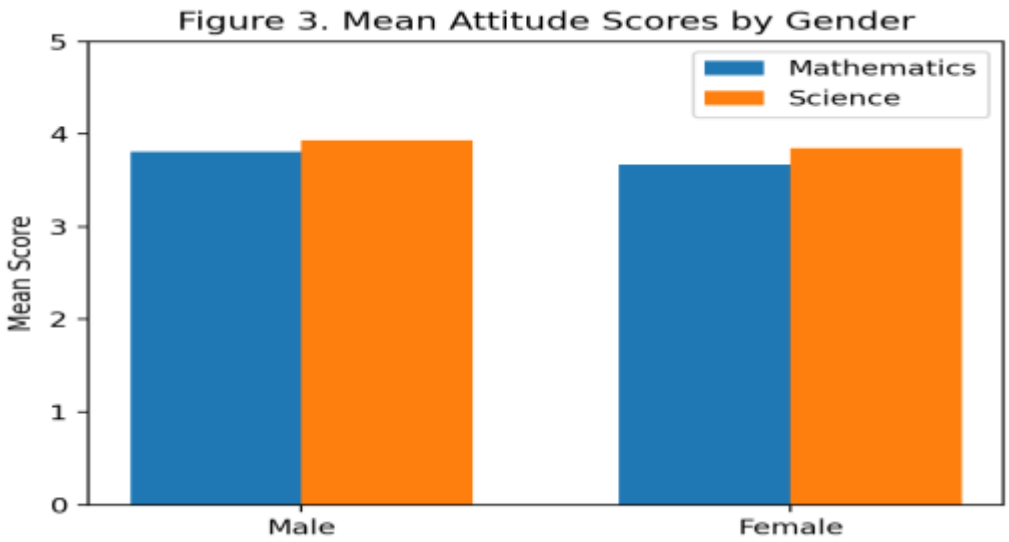
**Table 3 :- Gender Difference in Attitudes towards Mathematics and Science**

| Variable | Gender | N | Mean | SD | t-value | p-value | Decision |
|---|---|---|---|---|---|---|---|
| Mathematics Attitude | Male | 60 | 3.81 | 0.59 | 1.54 | 0.126 | Accept $H_03$ |
| | Female | 60 | 3.67 | 0.63 | | | |
| Science Attitude | Male | 60 | 3.93 | 0.56 | 0.87 | 0.387 | Accept $H_03$ |
| | Female | 60 | 3.85 | 0.61 | | | |

**Interpretation:-** The independent samples t-test revealed no statistically significant gender differences in attitudes towards Mathematics (**t = 1.54, p = 0.126**) or Science (**t = 0.87, p = 0.387**). Since the obtained p-values were greater than 0.05, the null hypothesis ($H_{03}$) was accepted. This indicates that male and female students possess similar attitudes towards Mathematics and Science.




**Hypothesis 4**

**$H_04$:** There is no significant difference between male and female senior secondary school students in their STEM career aspirations.

**Table 4 :- Gender Difference in STEM Career Aspirations**

| Gender | N | Mean | SD | t-value | p-value | Decision |
|---|---|---|---|---|---|---|
| Male | 60 | 3.79 | 0.68 | 1.78 | 0.078 | Accept $H_04$ |
| Female | 60 | 3.57 | 0.73 | | | |

**Interpretation:-** The results indicate that male students reported slightly higher STEM career aspirations (M = 3.79) than female students (M = 3.57). However, the difference was not statistically significant (**t = 1.78, p = 0.078**). Therefore, the null hypothesis ($H_{04}$) was accepted, indicating that gender does not significantly influence STEM career aspirations among the sampled students.

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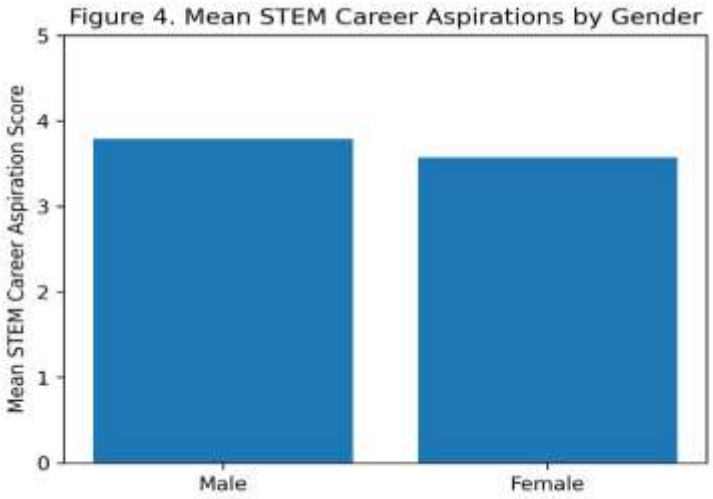


**Summary of Hypothesis Testing**

| Hypothesis | Statistical Test | p-value | Decision |
|---|---|---|---|
| $H_o1$ | Pearson Correlation | 0.000 | Rejected |
| $H_o2$ | Pearson Correlation | 0.000 | Rejected |
| $H_o3$ | Independent Samples t-test | 0.126 (Math), 0.387 (Science) | Accepted |
| $H_o4$ | Independent Samples t-test | 0.078 | Accepted |

**Major Findings Of The Study**

The preliminary empirical investigation yielded the following major findings:

1. Senior secondary school students in District Baramulla exhibited **moderately positive attitudes towards Mathematics (M = 3.74, SD = 0.61) and Science (M = 3.89, SD = 0.58)**, indicating a favourable perception of these subjects.

2. The respondents demonstrated **moderately high STEM career aspirations (M = 3.68, SD = 0.72)**, suggesting a growing interest in pursuing careers in science, technology, engineering, and mathematics.

3. A **moderate positive and statistically significant relationship** was found between students' attitudes towards Mathematics and their STEM career aspirations (**r = 0.592, p < 0.001**). Accordingly, the null hypothesis ($H_o1$) was rejected.

4. A **stronger positive and statistically significant relationship** was observed between students' attitudes towards Science and their STEM career aspirations (**r = 0.664, p < 0.001**). Hence, the null hypothesis ($H_o2$) was rejected.

5. No statistically significant gender differences were found in students' attitudes towards Mathematics (**t = 1.54, p = 0.126**) or Science (**t = 0.87, p = 0.387**). Therefore, the null hypothesis ($H_o3$) was accepted.

6. Although male students reported slightly higher STEM career aspiration scores than female students, the difference was **not statistically significant** (**t = 1.78, p = 0.078**). Consequently, the null hypothesis ($H_o4$) was accepted.

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## DISCUSSION OF FINDINGS

The present study sought to examine the attitudes of senior secondary school students towards Mathematics and Science and their relationship with STEM career aspirations. The findings reveal that students generally possess favourable attitudes towards both subjects, indicating that they recognize their importance for academic success and future career opportunities. The relatively higher mean score for Science suggests that students may perceive science-related disciplines as more relevant to contemporary career prospects. One of the most significant findings of the study is the positive relationship between attitudes towards Mathematics and Science and students' STEM career aspirations. Students who reported more positive attitudes towards these subjects were also more likely to express an interest in pursuing STEM-related careers. This finding is consistent with the expectancy-value theory, which suggests that learners are more inclined to pursue careers in subjects they value and in which they feel competent. It also aligns with previous empirical studies that have identified positive attitudes towards Mathematics and Science as important predictors of students' educational and occupational choices. The relationship between Science attitude and STEM career aspirations was found to be stronger than that between Mathematics attitude and career aspirations. This may indicate that students perceive science as more directly connected with professions such as medicine, engineering, biotechnology, environmental sciences, and healthcare. The finding highlights the importance of creating engaging science learning environments that stimulate students' curiosity and strengthen their motivation to pursue STEM careers. The study also found no statistically significant gender differences in either attitudes towards Mathematics and Science or STEM career aspirations. Although male students obtained marginally higher mean scores, the differences were not significant. This suggests that both male and female students possess comparable levels of interest in STEM education and careers. The finding reflects the gradual reduction of traditional gender stereotypes in education and indicates that equal educational opportunities may be encouraging greater participation of girls in STEM-related fields.

Overall, the findings emphasize that fostering positive attitudes towards Mathematics and Science during the senior secondary stage can contribute to strengthening students' aspirations for STEM careers. Schools should therefore adopt innovative teaching strategies, strengthen laboratory experiences, integrate real-life applications of Mathematics and Science into classroom instruction, and provide effective career guidance programmes. Such initiatives can help students make informed career choices while supporting the broader national objectives of promoting STEM education and developing a skilled workforce.

## CONCLUSION

The present study highlights the important role of students' attitudes towards Mathematics and Science in shaping their STEM career aspirations. The preliminary empirical findings indicate that senior secondary school students in District Baramulla generally possess favourable attitudes towards these subjects and demonstrate a moderate level of interest in pursuing STEM-related careers. The study further establishes that positive attitudes towards Mathematics and Science are significantly associated with higher STEM career aspirations, reaffirming the importance of cultivating interest and confidence in these subjects during the secondary school years. The absence of significant gender differences in attitudes and career aspirations suggests that both male and female students have comparable potential to pursue STEM education and professions when provided with equal learning opportunities and support. These findings underscore the need for schools to create engaging learning environments, strengthen laboratory and practical experiences, provide effective career guidance, and encourage active parental and teacher support to sustain students' interest in STEM disciplines.

Although the empirical component of the study is preliminary and based on a limited sample, it provides valuable evidence supporting the theoretical perspectives discussed in the review. The study contributes to the growing body of literature on STEM education by offering context-specific insights from District Baramulla, Jammu and Kashmir. Future research involving larger and more diverse samples, longitudinal designs, and mixed-method approaches is recommended to obtain a deeper understanding of the factors influencing students' attitudes and career aspirations in STEM fields. Such evidence can inform educational policies and interventions aimed at enhancing STEM participation and preparing students for the demands of a knowledge-driven economy.

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**Ethical Approval: -** This study was conducted in accordance with the ethical principles governing research involving human participants. Permission to conduct the study was also obtained from the relevant educational authorities and participating school heads. All participants were informed about the purpose of the study, and their participation was entirely voluntary. Informed consent was obtained from all respondents, and confidentiality and anonymity of the information provided were strictly maintained throughout the research.

**Conflict of Interest:-** The author declares that there are no financial, personal, professional, or other conflicts of interest that could have influenced the conduct, analysis, interpretation, or reporting of this research.

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