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Mathematics Anxiety and Its Relationship with Academic Confidence and Career Aspirations among Secondary School Students

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Abstract: ***This quantitative cross-sectional study examined mathematics anxiety, academic self-efficacy and career-related beliefs among 71 Indian students in Grades 9 and 10. Purposive sampling and a structured questionnaire were used, incorporating nine mathematics-anxiety items, eight academic self-efficacy items and researcher-developed career questions. Mathematics anxiety was negatively correlated with academic self-efficacy (r = −.31, p = .009). The mean mathematics-anxiety total was 20.15 (SD = 6.36), and academic confidence averaged 30.24 out of 40. Test anticipation and surprise quizzes elicited relatively high anxiety. Exploratory findings associated greater mathematics anxiety with career avoidance due to mathematics, although many respondents remained willing to pursue careers involving mathematics when aligned with their interests. The results suggest the relevance of academic confidence and mathematics-related emotions to career exploration, without establishing causality.***

Keywords: mathematics anxiety, academic self-efficacy, career aspirations, secondary school students, career guidance

1. Introduction

Mathematics supports educational progression and access to many occupational pathways. Yet students may experience worry during tests, homework and problem-solving. Mathematics anxiety can interfere with cognitive processing (Ashcraft, 2002) and is negatively associated with achievement (Barroso et al., 2021). For Indian students in Grades 9 and 10, academic demands coincide with emerging decisions about subject streams and careers. The present study considers whether mathematics-related anxiety is associated with perceived academic capability and career-related beliefs. Self-efficacy theory emphasizes beliefs about capability (Bandura, 1997), while expectancy-value theory considers anticipated success, perceived value and cost in educational choices (Eccles & Wigfield, 2002). Previous work has also linked mathematics anxiety with career preferences during development (Eidlin-Levy et al., 2023). This study investigated mathematics anxiety, academic confidence and perceived career opportunities in a secondary-school sample.

2. Material and Methods

Research Design and Sample

A quantitative, non-experimental, cross-sectional descriptive-correlational design was adopted. Data were gathered in October 2026 through a structured questionnaire and purposive recruitment. The final sample comprised 71 students in Grades 9 (n = 45) and 10 (n = 26), aged 13–17 years. There were 41 female and 30 male respondents, from private (n = 31), government-aided (n = 30) and government (n = 10) schools. Participation was voluntary, with assent and the required permission reported in the dissertation.

Instruments and Tools

Mathematics anxiety was assessed using a nine-item questionnaire based on the Modified Abbreviated Math Anxiety Scale (m-AMAS; Carey et al., 2017). Students rated mathematics-related situations from 1 (low anxiety) to 5 (high anxiety); total scores ranged from 9 to 45. The response anchors used in this study should be reported as administered and may differ from the published m-AMAS, so equivalence with the validated version is not assumed. Academic confidence was assessed through eight academic self-efficacy items based on Muris (2001), rated from 1 to 5, total range 8–40. Career aspirations were assessed through researcher-developed items concerning interests, perceived importance of mathematics, career avoidance, confidence and willingness to pursue mathematics-related pathways. These items were not combined into a validated overall career-aspiration score.

Procedure and Statistical Analysis

Students completed the questionnaire with demographic, anxiety, academic self-efficacy and career-related sections. Descriptive statistics summarized scores and response distributions; Pearson correlation assessed the main association. Career-related items were interpreted descriptively and through exploratory associations. The design cannot establish cause and effect.

3. Results and Discussion

The mathematics-anxiety total had a mean of 20.15 (SD = 6.36; observed range 9–36). Using the dissertation's descriptive score groupings, 18 students (25.4%) were in the low group, 29 (40.8%) in the moderate group and 24 (33.8%) in the high group. These groupings are sample-based, not validated diagnostic cutoffs. Anxiety was highest when anticipating a test (item mean 3.14) and facing a surprise quiz

(2.89), compared with watching the teacher work on the board (1.92). Academic confidence averaged 30.24 of 40.

Table 1: Descriptive scores reported in the dissertation. The academic-confidence total SD is not specified in the summary used here.

Measure	Mean	SD
Mathematics anxiety (9 items)	20.15	6.36
Academic confidence (8 items)	30.24	—

The principal finding was a statistically significant negative association between mathematics anxiety and academic self-efficacy (Pearson $r = -.31$, $p = .009$). Thus, students reporting greater mathematics anxiety tended to report lower confidence in academic tasks. The magnitude was modest, and the correlational design does not identify the direction of influence.

Career-related responses suggest a more nuanced pattern. About 69% perceived mathematics as at least moderately important for their contemplated careers. Some students reported avoiding careers due to mathematics, while 38 of 71 (53.5%) said they would pursue an appealing career and work to improve their mathematics skills; another 10 (14.1%) would seek support. The dissertation describes exploratory links between mathematics anxiety and career avoidance and between academic confidence and willingness to learn career-related mathematics. These career findings should be interpreted as item-level associations, not as evidence of a single validated career-aspiration construct.

The results are consistent with theoretical accounts emphasizing perceived capability and anticipated difficulty. However, anxiety does not determine career choice: interest and willingness to improve skills coexisted with reported mathematics-related concerns.

4. Conclusion

In this sample of Grade 9 and 10 students, mathematics anxiety was modestly and negatively associated with academic confidence. Evaluative situations generated relatively greater anxiety, and mathematics-related concern appeared relevant to some students' career considerations. Nevertheless, many respondents expressed openness to mathematics-involving careers. These findings support further attention to mathematics anxiety, academic self-belief and career exploration in secondary education.

5. Implications

Teachers and school counsellors may consider supportive assessment practices, confidence-building activities, early identification of mathematics-related worry and career guidance that distinguishes current difficulty from long-term occupational possibility. The study does not establish that any particular intervention is effective.

6. Limitations and Suggestions

The small purposive sample limits generalisability. All variables were self-reported, and the cross-sectional design precludes causal inference. The mathematics-anxiety and academic self-efficacy measures were adapted; instrument attribution, response anchors and reliability should be confirmed before journal submission. Career questions were researcher-developed, and exploratory comparisons warrant caution. Larger, more diverse and longitudinal samples, with validated measures and prospective career outcomes, would strengthen future research.

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