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Research Paper

Relationship between Anxiety, Multiple Intelligence and Academic Performance of Adolescent School Students: A Comparative Investigation

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ABSTRACT

The study attempted to examine the influence of gender, school type, and school location on anxiety, multiple intelligence (MI), and academic achievement among adolescent students, and further investigated the interrelationships among these variables. A purposive sample of 200 secondary school students from West Tripura, India, participated in the study. Standardized scales were administered to measure anxiety and MI. The academic achievement was assessed using students' last attained semester marks. Results revealed significant gender differences, with female students reporting higher anxiety and male students outperforming females in academic achievement, while no differences emerged in MI. Government school students showed significantly higher anxiety than their private school counterparts, though academic achievement and MI did not differ meaningfully between the groups. Comparisons across school location showed that urban students achieved significantly higher marks than rural students, while no differences were observed in anxiety and MI. Correlation analyses indicated strong positive associations among anxiety, MI, and academic achievement. The findings emphasize the need for school-based interventions that balance emotional well-being with cognitive development, especially in government and rural school settings.

Keywords: *Adolescents, Multiple Intelligence, Anxiety, Academic Achievement*

Adolescence is a critical developmental stage characterized by heightened emotional experiences, evolving cognitive capacities, and significant academic demands (Viru et al., 1999). Among the psychological factors influencing adolescents' educational outcomes, multiple intelligence (MI), anxiety, and academic achievement are noteworthy constructs. Understanding how these variables vary across gender, school type (government vs. private), and school location (rural vs. urban), as well as how they interrelate, is essential for understanding the dynamics of students' academic performance (to be referred to as 'marks' in this article.

Research consistently shows gender differences in anxiety, with adolescent girls often reporting higher levels of anxiety compared to boys (Bao& Han, 2025; Chawla & Vig, 2014). Such findings resonate with evidence suggesting that girls may experience increased

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academic stress and performance pressure, whereas boys sometimes display stronger academic achievement despite lower anxiety (Mokashi et al., 2012). Similarly, studies reveal variations in anxiety across school settings. While government school students may show greater anxiety levels compared to private school peers (Tehrani et al., 2014), urban–rural contrasts suggest that academic achievement tends to be higher among urban adolescents, despite minimal differences in their anxiety levels (Fatma, 2015).

When considering MI, gender differences are less prominent. While some evidence points to variability in specific intelligence domains, broad MI levels often do not significantly differ across gender or school type (Tehrani et al., 2014). However, contextual factors such as school resources, teaching quality, and peer environment may indirectly shape how students harness their intelligences for academic purposes.

The relationship among anxiety, MI, and academic achievement remains complex. Multiple studies emphasize a negative correlation between anxiety and academic performance, where high anxiety hinders concentration and lowers achievement levels (Merzaq, 2023; Harparkash, 2018; Bala& Sharma, 2019). Conversely, moderate levels of anxiety can sometimes act as a motivator, aiding performance under evaluative conditions (Parvez&Shakir, 2014). MI, on the other hand, has been strongly linked to academic outcomes, with students who display strengths across multiple intelligence domains often achieving higher marks (Schrack et al., 2021). Some research further suggests that anxiety may interact with intelligence, where specific forms of anxiety, such as test-related worry, influence how cognitive abilities translate into achievement (Castagna, Calamia, & Davis, 2019).

The existing literature and empirical evidence indicate that adolescent students' experiences of anxiety, their multiple intelligences, and academic outcomes are shaped by gender, school type, and location, and that these three variables are intricately interconnected. These patterns require to be studied in regional contexts to provide valuable insights for educational policy and interventions aimed at enhancing student well-being and achievement.

Hypotheses

On the context of the literatures reviewed, the following research hypotheses have been formed:

- **H1:** There exist significant gender differences in terms of Anxiety, MI and Marks of the students
- **H2:** There exists a significant difference across the school types in terms of Anxiety, MI and Marks of the students
- **H3:** There exists a significant difference across the school locations in terms of Anxiety, MI and Marks of the students
- **H4:** There exists a significant correlation between anxiety, multiple intelligence and academic marks of the students

METHODS

Participants

The participants consisted of 200 adolescent school children from West Tripura district, Tripura, India. A purposive sampling technique was utilized to amass the sample. The

demographic distributions of the participants have been given below. All the participants were of uniform ages (M = 16.5 years, SD = 2.1 years).

Table 1: Demographic distribution of the sample

Demographic Variables	**N**	**%**
Age		
Male	101	50.5
Female	99	49.5
School Types		
Government	100	50
Private	100	50
School Locations		
Rural	100	50
Urban	100	50

Materials

- **Anxiety Scale (AS-SSDG)** developed by Sarkar and Daswas used**.** The scale consists of 48 items, which is scored across a 4-point Likert scale ranging from 1 ("rarely") to 4 ("always"). There were no reverse coded items. The items of the scale are spread across six dimensions: Worry, General Anxiety, Low Self-Confidence, Over-Thinking, Panic Attacks and Depression. The male and female students' Cronbach's α were found to be 0.79 and 0.8, respectively. The scale also possesses satisfactory validity.
- **Multiple Intelligence Scale (MIS-ASPS)** a test developed by Agarwal and Pal () was used to assess multiple intelligence among the students. The scale has 90 items, spread across the following 9 dimension: Linguistic, Logical, Bodily, Kinesthetic, Spatial, Musical, Naturalistic, Interpersonal, Intrapersonal and Existential. The scale is scored across a 5-point Likert scale ranging from 1 ("Never") to 5 ("Always"). All the dimensions have 10 items each. Each of the dimension is composed of positive and negatively coded items. The scale has satisfactory dimension-wise test-retest (ranging between 0.71 to 0.8) and split-half reliability (ranging between 0.83 to 0.89). The scale also possesses satisfactory content validity.

  The marks of the students were derived by asking for their last semester/term total marks.

Procedure

The scales were organized and the printed questionnaire was prepared. For the data collection, students from different schools in West Tripura district, Tripura, India were approached and briefed about the research and their upcoming role in the research if they accept to participate. After taking prior appointments, the participants were met accordingly on their date and time. The instructions were elucidated properly and data was collected following all the ethical standards of research. The data collected was then tabulated and then subjected to statistical analysis of the data. All ethical standards of research were maintained throughout the research.

Statistical Analyses: For the first three hypotheses, the independent sample t-test was used. For the fourth hypothesis, the product moment correlation was conducted. All statistical analyses were conducted in SPSS v26.

RESULTS

Table 2: t-test for the difference in the anxiety, multiple intelligence and academic marks among the gender group

Variables	Groups	M	SD	M_{diff}	SE_{diff}	t	df	*p*
Anxiety	Female	114.634	18.931	12.411	3.136	3.958	182.782	0.000**
	Male	102.222	24.948					
MI	Female	284.465	50.845	2.112	7.584	0.278	195.186	0.781
	Male	282.354	56.216					
Marks	Female	290.465	78.962	-23.181	11.224	-2.065	197.821	0.040*
	Male	313.646	79.756					

*$p < 0.05$ **$p < 0.001$

An independent samples *t*-test was conducted to examine gender differences in anxiety, multiple intelligence (MI), and academic marks. Female students (M = 114.63, SD = 18.93) reported significantly higher anxiety levels than male students (M = 102.22, SD = 24.95), $t(182.78) = 3.96$, $p < .001$. No significant gender differences were found in MI ($t(195.19) = 0.28$, $p = .781$). However, males (M = 313.65, SD = 79.76) scored significantly higher in academic marks than females (M = 290.47, SD = 78.96) ($t(197.82) = -2.07$, $p = .040$).

Table 3: t-test for the difference in the anxiety, multiple intelligence and academic marks among the school types

Variables	Groups	M	SD	M_{diff}	SE_{diff}	t	df	*p*
Anxiety	Government	114.560	19.012	12.140	3.133	3.875	185.150	0.000**
	Private	102.420	24.900					
MI	Government	285.490	50.042	4.140	7.572	0.547	194.885	0.585
	Private	281.350	56.824					
Marks	Government	291.240	78.974	-21.400	11.240	-1.904	197.968	0.058
	Private	312.640	79.988					

**$p < 0.001$

As seen in the above table, students in government schools (M = 114.56, SD = 19.01) reported significantly higher anxiety than private school students (M = 102.42, SD = 24.90), $t(185.15) = 3.88$, $p < .001$. No significant differences were observed for MI($t(194.89) = 0.55$, $p = .585$). Academic marks did not differ significantly between government (M = 291.24, SD = 78.97) and private (M = 312.64, SD = 79.99) school students, ($t(197.97) = -1.90$, $p = .058$).

Table 4: t-test for the difference in the anxiety, multiple intelligence and academic marks among the school locations

Variables	Groups	M	SD	M_{diff}	SE_{diff}	t	df	*p*
Anxiety	Rural	110.270	22.700	3.560	3.240	1.099	197.936	0.273
	Urban	106.710	23.113					
MI	Rural	283.790	53.030	0.740	7.577	0.098	197.918	0.922
	Urban	283.050	54.123					
Marks	Rural	270.360	78.507	-63.160	10.417	-6.063	194.406	0.000**
	Urban	333.520	68.469					

**$p < 0.001$

As seen in the above table, no significant differences were found in anxiety between rural (M = 110.27, SD = 22.70) and urban (M = 106.71, SD = 23.11) students ($t(197.94) = 1.10$, $p = .273$). Similarly, no significant differences were observed for MI, $t(197.92) = 0.10$, $p =$

.922. However, urban students (M = 333.52, SD = 68.47) scored significantly higher in academic marks compared to rural students (M = 270.36, SD = 78.51) ($t(194.41) = -6.06$, $p < .001$).

Table 5: Correlation between anxiety, multiple intelligence and academic marks of the students

Variables	Stats	Anxiety	MI	Marks
Anxiety	r	**1**	.442**	.387**
	p		0.000	0.000
MI	r		**1**	.649**
	p			0.000
Marks	r			**1**
	p			

***p < 0.001*

Pearson correlation coefficients were computed to examine the relationships among anxiety, MI, and academic marks. Anxiety was significantly and positively correlated with MI ($r = .44$, $p < .001$) and academic marks ($r = .39$, $p < .001$). MI was also strongly and positively correlated with academic marks ($r = .65$, $p < .001$). Thus, higher anxiety is associated with higher MI and better academic performance, and that MI is strongly linked with academic achievement.
Hence, all of H1, H2, H3 and H4 have been partially accepted.

DISCUSSION

The present study sought to examine variations in multiple intelligence (MI), anxiety, and academic achievement among adolescents across gender, school type, and school location, as well as the correlations among these variables. The findings partially confirmed the hypotheses, and the results are well supported by prior research.

First, gender differences were evident in anxiety and academic achievement but not in MI. Female students demonstrated significantly higher levels of anxiety compared to males, which aligns with prior research consistently showing greater anxiety severity in female adolescents (Bao& Han, 2025; Chawla &Vig, 2014). This heightened anxiety among girls may be attributed to socio-cultural expectations, increased sensitivity to evaluative stress, and greater academic pressure. Meanwhile, males outperformed females in academic marks, a trend that has also been observed in some studies, where boys demonstrated stronger academic performance despite lower anxiety levels (Mokashi et al., 2012). The lack of gender differences in MI is in agreement with findings suggesting non-significant gender-based disparities in broader intelligence profiles (Furnham et al., 1999).

Second, when comparing government and private school students, the study revealed significantly higher anxiety levels among government school adolescents, although no meaningful differences were observed in MI or academic achievement. These findings are consistent with Tehrani et al (2014), who reported higher anxiety among government school students, potentially due to limited academic resources and heightened socio-economic stressors. Similarly, no substantial difference in MI between the two groups reflects the idea that intelligence is relatively stable across contexts, though its application might be shaped by school environments.

Third, the urban-rural comparison showed that urban students achieved significantly higher academic marks than rural students, even though no differences were observed in anxiety or MI. This pattern is corroborated by Fatma (2015), who reported significantly better academic outcomes for urban adolescents while anxiety remained similar across locations. Urban students may benefit from greater educational resources, exposure to competitive environments, and more stimulating academic ecosystems.

The correlational analyses revealed significant positive associations among anxiety, MI, and academic marks. Contrary to traditional perspectives where anxiety is negatively linked with performance, our findings suggest that anxiety, within manageable levels, may function as a motivating factor, pushing students to engage more with their academic tasks. This aligns with evidence showing nuanced roles of anxiety, where moderate levels of worry or physiological arousal may enhance performance, while excessive anxiety is detrimental (Castagna et al., 2019). Moreover, positive associations between intelligence and academic achievement are consistently supported in the literature (Arya &Aujla, 2024; Malakar, 2019). The strong link between MI and academic achievement in this study echoes research showing that broader emotional and cognitive abilities predict better educational performance (Gupta, 2013; Dash &Bairiganjan, 2021).

The observed positive correlation between anxiety and MI in this study can be explained by the interdependence of emotional regulation and cognitive functioning. Some research suggests that heightened anxiety may trigger adaptive use of multiple intelligences or coping strategies, which, in turn, support academic achievement (Keates& Pearson, 2023; Cécillon et al., 2024). Thus, rather than purely detrimental, anxiety can coexist with enhanced MI and academic performance, depending on its intensity and management.

CONCLUSION

The current study could determine that anxiety, multiple intelligence, and academic achievement among adolescents are shaped by gender, school type, and school location in distinct ways, with females and government school students reporting higher anxiety, males and urban students excelling academically, and MI showing no relative change across groups. The strong positive correlations among anxiety, MI, and academic achievement suggest that anxiety, when balanced, may serve as a constructive motivator rather than solely a hindrance, while MI emerges as a essential predictor of academic marks. There is the importance of promoting supportive learning environments that not only enhance students' cognitive and multiple intelligence capacities but also address emotional well-being, particularly in rural and government school contexts. This would ensure more equitable academic outcomes across adolescent school students.

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Conflict of Interest
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