



The Role of Cognitive Style in Academic Achievements and Creative Thinking among Students

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HIGHLIGHTS

- Examines cognitive styles influencing decision-making: systematic (analytical) and intuitive (holistic, rapid).
- Compares the impacts of both styles on problem-solving and learning approaches.
- Highlights individual differences and their implications in education and organizational behaviour.
- Recommends tailoring strategies to cognitive preferences for improved performance and engagement.

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ABSTRACT

Cognitive ability significantly influences an individual's life trajectory. The study explored the cognitive styles of undergraduate students in the Sadar sub-division of West Tripura district, Tripura, during 2024-25. A stratified random sample of 100 students was selected for the investigation. The study addressed specific research objectives and hypotheses related to gender based variations in cognitive style and its connection with academic achievement and creative thinking. Comparison of academic achievement scores between students with systematic and intuitive cognitive styles yielded a significant difference ($t = 2.51$, $p < 0.05$), favouring those with a systematic style. Pearson correlation analysis revealed strong positive and significant relationships between academic performance and both systematic ($r = 0.86$, $t_r = 16.68$) and intuitive ($r = 0.70$, $t_r = 13.57$) cognitive styles. In particular, students with a systematic cognitive style tended to perform better academically than those with an intuitive style. Further, students with a systematic cognitive style consistently secured higher academic scores compared to their intuitive counterparts. The findings contribute to the broader understanding of cognitive styles in educational settings and provide insights for enhancing academic support strategies in higher education.

INTRODUCTION

In everyday life, every individual has to engage in interactions with their environment to continue the battle of life. Driven by the demands of life and livelihood, people are constantly immersed in thoughts. Every puzzle of life has to be solved by human cognitive abilities. Thus, cognitive processes continually occur within individuals. Essentially, cognitive processes are cerebrum mechanisms that determine the acquisition of knowledge and the

level of understanding of that knowledge (Vranic & Martin, 2019). Cognitive processes involve various mental activities such as thinking, reasoning, memory, attention, problem-solving, language, and decision-making. These functions enable us to gather, retain, use, observe, reflect, and recall information effectively to navigate and engage with the world around us (Sellah et al., 2018; Jonassen & Grabowski, 2012). Padaria (2020) highlighted the importance of cognitive presence, how learners integrate concepts and theories within extension education, a construct that aligns with dimensions

of cognitive style relevant to creative thinking. Cognitive style reflects the tone of behaviour rather than serving as a mediating process, representing an individual's way of functioning across different behavioural contexts (Coop & Sigle, 1971; McKenney & Keen, 1974; Botkin, 1974).

In this context, systematic and intuitive cognitive styles represent two key approaches individuals use for thinking, solving problems, and decision-making. Systematic Cognitive Style refers to a logical and structured way of thinking, where problems are solved or decisions are made step by step based on specific rules or data. In terms of characteristics, analytical and detail-oriented thinking are evident in this style. Systematic cognitive style relies heavily on logic or reasoning (Coop & Sigel, 1971; Buch, 1979). It demonstrates proficiency in planning and following processes. Reviewing all relevant information before making a decision is one of the hallmark traits of a systematic cognitive style. Intuitive Cognitive Style refers to a way of thinking where decisions are made based on experience, feelings, and intuition, with less reliance on structured analysis. In terms of characteristics, an intuitive cognitive style excels at quick decision making. It focuses on the big picture or overall context. It identifies patterns or a connection based on experience and often leans toward creative and innovative solutions. However, for success in life, maintaining a balance between the two styles is crucial, sometimes learning styles and career choices are interconnected (Kriti et al., 2025). Those who can effectively balance between two styles tend to achieve success more easily (Behera, 2022).

The research focuses on examining the cognitive style of students currently studying in college. After completing their college education, they will enter into a career contributing to the development of the nation. Thus, the academic success in college, soft skills and creative thinking will largely smooth their path in future life (Sikdar and Prakash, 2025). It also attempts to identify the relationship between the academic success of college students and their respective cognitive styles. Furthermore, the study seeks to estimate both systematic and intuitive cognitive styles among these students and examine how they vary by gender. It also aims to explore whether cognitive styles significantly relate to students' academic achievement and creative thinking. Identification of these patterns may help in developing region-specific insights for educators to design more effective, tailored instructional strategies, ultimately to support educational planning, psychological research, and policy development for enhancing student learning and well-being.

METHODOLOGY

The study adopted a descriptive survey approach to analyze how cognitive styles relate to academic success and creative thinking among undergraduate college students in the Sadar subdivision of West Tripura district; Tripura. The target group included all the undergraduate students who had completed their higher secondary school education. A total of 100 participants from 2 colleges (50 from each college) were selected using stratified random sampling, ensuring an equal distribution of male and female students to maintain gender balance and reduce sampling bias. The research included four null hypotheses: (1) Systematic cognitive style among

students is not influenced by gender and gender does not have an effect on intuitive cognitive style; (2) Academic achievement does not significantly differ between students exhibiting systematic and intuitive cognitive styles; (3) Cognitive style and academic performance are not significantly correlated and (4) Systematic and intuitive Cognitive styles have no relationship with creative thinking. The key variables considered in the study were systematic and intuitive cognitive styles as independent variables, academic achievements and creative thinking as the dependent variables, and gender as a demographic factor. Data collection involved two standardized instruments, the first was the Cognitive Style Inventory (CSI-J), developed by Jha (2010), which evaluated how individuals process, judge, recall, store, and utilize information. It consisted of five subtests totaling 66 items presented on a 5-point Likert scale, with options ranging from "strongly agree" to "strongly disagree". The second tool was the "Creative Thinking Scale for college students (TWC)" developed by Mehdi (1985). This scale included four pretests, namely: Consequence Test, Unusual Uses Test, New Relationship Test, and Product Improvement Test. These tests were designed to evaluate an individual's capacity for divergent thinking, and the tool measures four core criteria (fluency, flexibility, originality, and creativity) designed to assess students' creative potential across various domains. This scale provided a comprehensive view of creative thinking and is suitable for students from middle school to graduate level. During administration, the researcher first built rapport with the students to ensure they could express ideas freely and without hesitation. Clear instructions were delivered in simple and easily understandable language, and adequate time was provided for each test to encourage spontaneous and thoughtful responses. To ensure ethical standards, participants were informed about the purpose and the voluntary nature of the study. The collected data were subjected to both descriptive and inferential statistical analysis.

RESULTS

Degree of systematic and intuitive cognitive style among college students

Table 1 revealed that among those in the case of extremely high systematic cognitive style, females (16%) outperformed males (10%). However, male students demonstrated higher percentages at the high (16%), above average (20%), and average (28%) levels, compared to female students at 14%, 18% and 22% respectively. Female students recorded higher percentages at the below average level (24%) than males (20%), while at the low level, male students (6%) surpassed female students (4%). Notably, no male students were found in the extremely low category, but 2 per cent of the female students were in this category. Findings revealed that higher percentage of the college students stood at the below average, low, and extremely low levels, indicating that selected undergraduate students are lagging behind others.

The intuitive cognitive style distribution showed that male students exhibited a higher percentage at the extremely high level (14%) compared to female students (8%). Both genders of students recorded equal representation (10%) at the high level. At the above-average level, male students (28%) scored higher than female

Table 1. Level of cognitive style among college students based on gender

Category	Range of Z Score	Level	% Male (n=50)	% Female (n=50)
Systematic Style				
83 & above	+2.01 and above	Extremely high	10	16
75 to 82	+1.26 to + 2.00	High	16	14
68 to 74	+0.51 to +1.25	Above average	20	18
58 to 67	-0.50 to +0.50	Average	28	22
51 to 57	-0.50 to -1.25	Below average	20	24
43 to 50	-1.25 to -2.00	Low	6	4
42 & above	-2.01 and below	Extremely low	0	2
Intuitive Style				
87 & above	+2.01 and above	Extremely high	14	8
79 to 86	+1.26 to + 2.00	High	10	10
71 to 78	+0.51 to +1.25	Above average	28	22
60 to 70	-0.50 to +0.50	Average	20	26
52 to 59	-0.50 to -1.25	Below average	16	22
44 to 51	-1.25 to -2.00	Low	10	12
43 & above	-2.01 and below	Extremely low	2	0

counterparts (22%). In contrast, female students had a stronger presence at the average level (26%) compared to male students (20%). For the below average and low levels, female students scored 22 per cent and 12 per cent, slightly higher than males at 16 per cent and 10 per cent, respectively. Only male students (2%) were found at an extremely low level.

Role of systematic and intuitive cognitive styles on academic achievement

The analysis of academic performance revealed a noteworthy distinction between students with different cognitive styles. Learners exhibiting a systematic cognitive style demonstrated higher academic achievement, with a mean score of 75.6 (SD = 9.78), compared to their peers with an intuitive cognitive style, who averaged 72.08 (SD = 10.12). The computed t-value of 2.51 surpassed the critical value at the 5% level of significance, indicating that the observed difference in academic performance between the two groups is statistically significant.

Correlation between cognitive style and academic achievements

Table 3 further revealed a strong and statistically significant relationship between cognitive styles and academic performance.

Students with a systematic cognitive style showed a robust positive correlation with academic achievement ($r = 0.86$), while those with an intuitive cognitive style also demonstrated a substantial positive correlation ($r = 0.70$). The corresponding t-ratio value was 16.68 for the systematic style and 13.57 for the intuitive style, which was exceeded the critical thresholds, confirming the statistical significance of both associations.

Relationship between cognitive style and creative thinking of college students

Table 4 represents correlation analysis undertaken to investigate the association between cognitive styles (systematic and intuitive) and multiple dimensions of creative thinking namely, fluency, flexibility, originality, and composite creativity scores among male and female undergraduate students. The findings revealed gender-specific patterns in the strength and significance of these associations. Among male participants, the systematic cognitive style demonstrated statistically significant, though modest, positive correlations with flexibility ($r = 0.198$, $p < 0.05$) and overall creativity ($r = 0.205$, $p < 0.05$). Although relationships with originality ($r = 0.172$) and fluency ($r = 0.164$) were observed, they did not reach statistical significance. In contrast, the intuitive cognitive style in males exhibited weaker associations across all

Table 2. Role of cognitive styles on academic achievement

Cognitive styles	n	Mean score of academic achievement	sd	df	't' value
Systematic cognitive styles	100	75.6	9.78	198	2.51*
Intuitive cognitive styles	100	72.08	10.12		

Note: *Significant at 5%; NS- Non Significant; df- degree of freedom; sd- Standard deviation

Table 3. Correlation between different cognitive style with academic achievement

Variable	No. of students (n)	'r' value	df	tr
Systematic cognitive style & academic achievement	100	0.86*	98	16.68
Intuitive cognitive style & academic achievement	100	0.70*	98	13.57

Note: *=Significant at 5%; r = Pearson correlation coefficient; tr = significance test of correlation; df = degrees of freedom

Table 4. Relationship between different cognitive style and creative thinking (n = 100)

Variables	Gender of the students	Systematic Cognitive Style	Intuitive Cognitive Style	Fluency	Flexibility	Originality	Creativity
Systematic Cognitive Style	Male	1	0.422**	0.164	0.198*	0.172	0.205*
	Female	1	0.445**	0.182	0.215*	0.190	0.222*
Intuitive Cognitive Style	Male	0.422**	1	0.148	0.118	0.188	0.157
	Female	0.445**	1	0.160	0.136	0.209	0.176
Fluency	Male	0.164	0.148	1	0.768**	0.734**	0.902**
	Female	0.182	0.160	1	0.785**	0.760**	0.925**
Flexibility	Male	0.198*	0.118	0.768**	1	0.742**	0.910**
	Female	0.215*	0.136	0.785**	1	0.765**	0.923**
Originality	Male	0.172	0.188	0.734**	0.742**	1	0.860**
	Female	0.190	0.209	0.760**	0.765**	1	0.878**
Creativity	Male	0.205*	0.157	0.902**	0.910**	0.860**	1
	Female	0.222*	0.176	0.925**	0.923**	0.878**	1

Note: M = Male students, F = Female students, * $p < 0.05$, ** $p < 0.01$ (Significant correlation), Variables measured using Pearson's correlation coefficient (r), Creativity = Composite score of fluency, flexibility, and originality

dimensions, with the highest being with originality ($r = 0.188$), which remained statistically non-significant. In the case of female students, the associations between systematic cognitive style and creative thinking variables were slightly stronger and statistically significant for both flexibility ($r = 0.215$, $p < 0.05$) and overall creativity ($r = 0.222$, $p < 0.05$). Moreover, correlations with originality ($r = 0.190$) and fluency ($r = 0.182$) were marginally higher than those observed in the male cohort, though still not significant. The intuitive cognitive style among females was weakly associated with creative thinking dimensions, with the most notable correlations being with originality ($r = 0.209$) and creativity ($r = 0.176$), neither of which achieved statistical significance.

Notably, the strongest correlations emerged not with cognitive styles, but among the dimensions of creative thinking themselves. Across both genders, fluency and overall creativity exhibited a very strong positive correlation— $r = 0.902$ for males and $r = 0.925$ for females (both $p < 0.01$). Similarly, flexibility and creativity showed high correlation coefficients ($r = 0.910$ for males, $r = 0.923$ for females, $p < 0.01$), while originality also correlated strongly with overall creativity ($r = 0.860$ for males, $r = 0.878$ for females, $p < 0.01$). These findings suggest that while cognitive style, particularly the systematic type, bears some influence on creative thinking—especially in terms of flexibility and total creativity score—the internal dimensions of creativity are far more strongly interrelated, reflecting a cohesive cognitive construct across genders.

DISCUSSION

The study reveals notable gender-based patterns in cognitive styles (Alalouch, 2021) and cognitive styles plays an important role in academic achievement, similar results also identified by Amin et al., (2023) & Singh et al., (2020). Although more female students appeared at the extremely high level of systematic cognitive style, male students generally performed better in the combined high to average range. The higher proportion of female students at the below average and extremely low levels indicates variability in their cognitive performance, suggesting a need for targeted support programs. These trends align with findings of Halpern (2012) &

Hyde (2014), who noted that males tend to demonstrate more consistent cognitive patterns, while females show more variability. Giancola et al., (2022) found that field-independent individuals, who tend to process information independently of surrounding context, performed significantly better on visual creative tasks than field-dependent peers, underscoring cognitive style as a foundational component in creative output. With regard to intuitive cognitive styles, male students showed higher percentages at the extreme and above average levels, suggesting stronger intuitive abilities in certain contexts. However, female students demonstrated more consistency around the average level. This finding reflects research by Phillips et al., (2004), which emphasized that male student may excel in rapid, intuitive tasks, while female students maintain a more balanced cognitive profile. The lack of statistically significant differences in systematic and intuitive cognitive styles between the genders supports the view that cognitive styles are shaped more by environmental and educational factors than by biological sex (Zhang & Sternberg, 2005; Vera, 2024). The observed differences in distribution may be attributed to socio-cultural influences and individual learning experiences. The significant advantage of systematic cognitive style over intuitive style in terms of academic performance suggests that a structured, analytical approach enhances academic outcomes. This reinforces and emphasizes the role of systematic thinking in achieving academic success (Talat, 2017; Nadaf et al., 2019). Alalouch (2021), found gender and students clarity about their cognitive style were the best predictors of academic performance. Furthermore, the strong positive correlation between both cognitive styles and academic achievement underscores the importance of cognitive development in educational planning. Hussin et al., (2021) found a statistically significant relationship between cognitive style and academic performance. Students with well-developed systematic or intuitive styles tend to perform better academically, confirming that cognitive flexibility and clarity in thought processes contribute positively to learning outcomes (Cools & Van den Broeck, 2007).

The findings also indicate a positive association between cognitive style and creative thinking among college students. Both male and female students with systematic cognitive style exhibited

stronger correlations with creative thinking components compared to those with intuitive style, similar results also identified by Taneja et al., (2023); Ho & Kozhevnikov (2023). Further, female students consistently demonstrated slightly higher correlation coefficients between systematic cognitive style and creative thinking dimensions than male students. This suggest that females derive more creative advantage from structured, logical thinking processes and the findings aligns with previous literature emphasizing the growing role of cognitive regulation and structured thought in female academic and creative success (Hyde, 2014; Zhang & Sternberg, 2005). The strong inter-correlations between fluency, flexibility, originality and creativity reinforce the view that these dimensions are synergistic and collectively define creative capacity (Bellemare Pepin & Jerbi, 2024). These findings provide empirical support for educational strategies that encourage integrated development of both cognitive styles, especially emphasizing systematic approaches to enhance creative potential in students. In conclusion, the results emphasize the need for a balanced cultivation of systematic and intuitive cognitive abilities to support creative thinking, with a tailored focus on gender-responsive pedagogical interventions.

CONCLUSION

The study establishes that cognitive styles, particularly the systematic type, are significantly associated with academic achievement and creative thinking among college students. Both systematic and intuitive styles demonstrate positive correlations with academic performance; however, the systematic style is significantly linked to higher achievement and enhanced creative capacities, especially in flexibility and overall creativity. Although gender based differences in cognitive styles were not statistically significant, the observed variation in distribution highlights the need for differentiated instructional strategies. The findings underscore that cognitive development, rather than gender, plays a more decisive role in academic and creative outcomes. From an extension education perspective, these insights are valuable for designing learner-centric programmes that acknowledge individual thinking patterns. Educational planners, faculty, and extension professionals should integrate cognitive style awareness into curriculum development and capacity-building initiatives to enhance student engagement and performance. By fostering both systematic and intuitive thinking abilities, institutions can create more inclusive and effective learning environments that support holistic student development. Consent of Publication: Participants provided consent for publication

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