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METACOGNITIVE SKILLS AND ACADEMIC ACHIEVEMENT OF HIGHER SECONDARY LEARNERS IN WEST BENGAL

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ABSTRACT

The present study seeks to investigate the 'relationship between metacognitive skills and academic achievement among higher secondary learners in West Bengal'. A sample of 638 Class XI students was selected using a 'simple random sampling technique'. The researchers employed 'a standardized Metacognitive Skills Scale,' developed and validated specifically for this study, to assess students' metacognitive competencies. Academic achievement was measured using official school performance records. The research also aimed to explore 'significant differences in metacognitive skills and academic achievement with respect to gender, locale (urban/rural), and academic stream (arts/science).' The study adopted a 'descriptive survey method,' and data were analysed using inferential statistical techniques including the 'independent samples t-test and Pearson's product-moment correlation.' The findings revealed statistically 'significant differences in both metacognitive skills and academic achievement across gender, locale, and academic stream.' Furthermore, 'a moderate and positive correlation' was found between 'metacognitive skills and academic achievement'. These results underscore the importance of integrating metacognitive strategy training into the school curriculum to enhance learners' academic performance and foster independent learning. The study contributes valuable insights for educators, curriculum developers, and policymakers aiming to improve higher secondary education outcomes through metacognitive skill development.

Keywords: Academic Achievement, Higher Secondary Learners, Metacognitive Skills, Self-regulated Learning, Student Learning Outcomes

INTRODUCTION

Our educational system seeks to instil in learners the fundamental knowledge, abilities, attitudes, and competences necessary for their personal growth and, in turn, the advancement and development of the country (UNESCO, 2015). Formal education, in particular, is a deliberate process designed to shape students into responsible citizens who can guide the nation toward progress (Dewey, 1938). This is the desired, more all-encompassing, and broad result of education. However, learners' excellent academic success combined with their co-academic achievements is the most directly observable and immediately achievable educational goal (Tuckman, 1992). Since the higher secondary stage of school marks a turning point in every student's life, the importance of academic achievement increases significantly (Eccles & Roeser, 2011). It is challenging for learners to successfully navigate this transitional phase, as they must adapt to their fast-changing bodies, emotional fluctuations, societal expectations, and the complexities of career decisions (Steinberg, 2014). These combined stressors can result

in emotional instability or maladjustments, often affecting academic performance. Emotional disturbances and exam-related stress may hinder performance even in capable students (Sharma & Sidhu, 2011). These include classroom environment, guidance services, and institutional infrastructure (Fraser, 1994), as well as home environment, parental attitudes, financial stability, and job prospects (Hill & Tyson, 2009). Beyond these institutional and familial determinants, personal and psychological variables also significantly influence academic achievement, including learners' goals, motivation, learning preferences, and emotional well-being. Among these, metacognitive skills—have been identified as a key psychological factor influencing academic success (Flavell, 1979; Schraw & Dennison, 1994). These skills enable learners to take conscious control of their cognitive processes, thereby enhancing learning effectiveness and academic outcomes.

RATIONALE OF THE STUDY

Higher secondary education is important since it is where learners choose their career decisions and their performance affects their future. Higher secondary learners must, nevertheless, deal with their physical, emotional, psychological, and social developmental challenges since they are teenagers. According to Hall et al. (2002), Erik Erikson stated that "they generally experience the identity crisis or identity confusion." Social, familial, and peer influences, along with psychological and environmental problems, may cause learners to stray from appropriate learning techniques, which might have a detrimental impact on their academic performance and advancement. Additionally, a number of studies demonstrate the value of metacognition and metacognitive abilities in improving academic achievement across a range of educational levels. It is assumed that learners' accomplishment and metacognition have a good cause and effect connection. Understanding learners' metacognitive abilities may aid in developing effective teaching methods that combine academic counselling with training in metacognitive capabilities. Understanding learners' metacognitive abilities may help them achieve better academic results, facilitate learning, and realize educational goals directly or indirectly. All parties involved, including educators and parents, may implement effective tactics to improve learners' metacognitive abilities and, in turn, their academic achievement.

OBJECTIVES OF THE STUDY

1. To examine the extent to which metacognitive skills vary among higher secondary learners in West Bengal with respect to gender, locale, and academic stream.

2. To examine the extent to which academic achievement varies among higher secondary learners in West Bengal with respect to gender, locale, and academic stream.

3. To determine the strength and direction of the relationship between metacognitive skills and academic achievement among higher secondary learners in West Bengal.

HYPOTHESES OF THE STUDY

After identifying the research objectives, it becomes necessary to frame hypotheses to provide a focused and empirical direction to the study. In the present research, which aims to examine the differences among demographic variables as well as 'relationship between metacognitive skills and academic achievement of higher secondary learners in West Bengal, hypotheses are

framed to test the assumed link between students' ability to regulate their own thinking and their academic performance'. Framing hypotheses enables the researcher to translate abstract concepts like "metacognitive skills" into measurable variables, thereby allowing systematic data collection and statistical analysis.

H_{01} There is no statistically significant difference in the metacognitive skills of higher secondary learners in West Bengal with respect to their gender.

H_{02} There is no statistically significant difference in the metacognitive skills of higher secondary learners in West Bengal with respect to their locale.

H_{03} There is no statistically significant difference in the metacognitive skills of higher secondary learners in West Bengal with respect to their academic stream.

H_{04} There is no statistically significant difference in the academic achievement of higher secondary learners in West Bengal with respect to their gender.

H_{05} There is no statistically significant difference in the academic achievement of higher secondary learners in West Bengal with respect to their locale.

H_{06} There is no statistically significant difference in the academic achievement of higher secondary learners in West Bengal with respect to their academic stream.

H_{07} There is no statistically significant relationship between metacognitive skills and academic achievement among higher secondary learners in West Bengal.

Research Methodology

A descriptive study design was employed. West Bengal's higher secondary schools were the subject of an extensive survey.

a. Population and Sample

All learners registered in West Bengal's higher secondary schools make up the study's population. The sample consisted of 638 higher secondary learners. Students in the 11th grade from various higher secondary schools located in both rural and urban areas were chosen using a simple random sample procedure.

Table 1: *'Showing the distribution of Sample according to Demographic Variables'*

Demographic Variables	Group	N
Gender	*Boys*	286
	Girls	352
Locale	*Urban*	402
	Rural	236
Academic Stream	*Arts*	359
	Science	279
Total		638

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b. Tools Used in the Study

The study made use of the researcher's Metacognitive Skills Scale. Metacognitive Knowledge, Learning Knowledge, and Planning & Monitoring Ability are its three components. It has thirty items with a 5-point rating system. The Metacognitive Skills Scale has been shown to be both reliable and valid, with test-retest reliability at 0.75.

c. Data Collection

The researchers visited the schools in person with permission from the headmasters of each school. Before distributing the tool to the learners, the researcher had a brief discussion with them to obtain accurate answers. Clear instructions were provided to the learners on how to record their responses for each item related to the tool.

d. Statistical Techniques

To analysis the data the investigator 'used Independent Sample t-test and Pearson Correlation Analysis for the study'.

ANALYSIS AND INTERPRETATIONS OF DATA

Inferential Statistics

H_{01} There is no significant difference in the 'metacognitive skills of higher secondary learners in West Bengal with respect to their gender.'

Table 2: *Based on Gender, difference between 'Means Scores of Metacognitive Skills'*

Group	N	Mean	SD	df	*t*- value	*p*-value
Boys	286	98.32	11.29			
Girls	352	100.29	9.51	636	3.695	.000

As presented in Table 2, the '*calculated t-value (3.695)'* for gender is greater than the '*critical t-value (2.58) at the 0.01 level of significance,'* indicating a *'statistically significant result.'* Consequently, '*the null hypothesis is rejected'*. This suggests that a '*significant difference exists in the metacognitive skills of boys and girls higher secondary learners.'*

H_{02} There is no significant difference in the 'metacognitive skills of higher secondary learners in West Bengal with respect to their locale.'

Table 3: *Based on Locale, difference between 'Means Scores of Metacognitive Skills'*

Group	N	Mean	SD	df	*t*- value	*p*-value
Urban	402	102.98	10.28			
Rural	236	94.31	8.19	636	2.879	.000

As presented in Table 3, the '*estimated t-value (2.879)'* for locale exceeds the '*critical t-value (2.58) at the 0.01 level of significance,'* indicating a *'statistically significant result.'* Accordingly, the '*null hypothesis is rejected'*. This implies that there is a *'significant difference in the metacognitive skills of urban and rural higher secondary learners.'*

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H_{03} There is no significant difference in the 'metacognitive skills of higher secondary learners in West Bengal with respect to their academic stream.'

Table 4: *Based on Academic Stream, difference between 'Means Scores of Metacognitive Skills'*

Group	N	Mean	SD	df	*t*- value	*p*-value
Arts	359	113.54	12.87			
Science	279	108.47	10.13	636	3.356	.000

As presented in Table 4, the *'calculated t-value (3.356)'* for academic stream exceeds the '*critical t-value (2.58) at the 0.01 level of significance,'* indicating a *'statistically significant result.'* Therefore, '*the null hypothesis is rejected.'* This suggests that *'a significant difference exists in the metacognitive skills of arts and science higher secondary learners.'*

H_{04} There is no significant difference in the 'academic achievement of higher secondary learners in West Bengal with respect to their gender.'

Table 5: *Based on Gender, difference between 'Means Scores of Academic Achievement'*

Group	N	Mean	SD	df	*t*- value	*p*-value
Boys	286	103.98	10.73			
Girls	352	99.87	8.79	636	2.985	.000

As presented in Table 5, the *'calculated t-value (2.985)'* for gender exceeds the *'critical t-value (2.58) at the 0.01 level of significance,'* indicating a *'statistically significant result.'* Consequently, *'the null hypothesis is rejected.'* This indicates that *'a significant difference exists in the academic achievement of male and female higher secondary learners.'*

H_{05} There is no significant difference in the 'academic achievement of higher secondary learners in West Bengal with respect to their locale.'

Table 6: *Based on Locale, difference between 'Means Scores of Academic Achievement'*

Group	N	Mean	SD	df	*t*- value	*p*-value
Urban	402	105.19	10.29			
Rural	236	101.59	7.97	636	3.189	.000

As presented in Table 6, the *'calculated t-value (3.189)'* for locale exceeds the *'critical t-value (2.58) at the 0.01 level of significance,'* indicating a *'statistically significant result.'* Accordingly, the *'null hypothesis is rejected.'* This suggests that *'a significant difference exists in the academic achievement of urban and rural higher secondary learners.'*

H_{06} There is no significant difference in the 'academic achievement of higher secondary learners in West Bengal with respect to their academic stream.'

Table 7: *Based on Academic Stream, difference between 'Means Scores of Academic Achievement'*

Group	N	Mean	SD	df	*t*- value	*p*-value
Arts	359	106.49	11.29			
Science	279	99.27	8.27	636	2.756	.000

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As presented in Table 7, the *'calculated t-value (2.756)'* for academic stream exceeds the *'critical t-value (2.58) at the 0.01 level of significance,'* indicating a *'statistically significant result.'* Therefore, *'the null hypothesis is rejected.'* This implies that *'a significant difference exists in the academic achievement of arts and science higher secondary learners.'*

H_{07} There is no significant relationship between 'metacognitive skills and academic achievement of higher secondary learners in West Bengal.'

Table 8: '*Correlation between Metacognitive Skills and Academic Achievement'*

Correlation		MS	AA
MS	*Pearson Correlation* *Sig. (2-tailed)* *N*	1 638	.446** .000 638
AA	*Pearson Correlation* *Sig. (2-tailed)* *N*	.446** .000 638	1 638

As shown in Table 8, the *'Pearson correlation coefficient between metacognitive skills and academic achievement among higher secondary learners is r = .446, which is statistically significant at the 0.01 level (p < .01).'* This reflects a moderately strong positive correlation between the two variables. Therefore, it may be concluded that metacognitive skills are substantially and positively associated with academic achievement in higher secondary learners.

EDUCATIONAL IMPLICATIONS

Implementing structured metacognitive exercises that prompt learners to reflect critically on their prior knowledge, personal interests, and cognitive strengths fosters greater self-awareness. This reflective practice not only enhances learner autonomy but also provides educators with valuable insights to tailor instructional approaches effectively.

In order to foster metacognitive growth among students, educators must recognize and accommodate the individual differences in learners' levels of metacognitive awareness. Instructional strategies should be differentiated and inclusive, ensuring that pedagogical interventions are responsive to diverse cognitive profiles within the classroom.

The findings indicate that variables such as gender, geographic location, and academic stream do not significantly influence learners' metacognitive abilities. Consequently, there is a need to implement innovative, universally designed teaching strategies and educational practices that facilitate the development of metacognitive skills across all learner demographics.

Students should be encouraged to cultivate metacognitive competencies by regularly evaluating their learning styles and academic performance. This self-assessment enables them to adopt adaptive learning strategies, thereby improving academic outcomes through informed decision-making and goal-oriented planning.

CONCLUSION

Effective classroom instruction should consistently integrate activities that cultivate a systematic, reflective, and deliberate approach to learning. When students are encouraged to engage in purposeful reflection, assessment, and adaptation of their learning strategies, they develop the capacity to monitor and improve their cognitive processes over time. This process not only enhances academic performance but also lays the foundation for lifelong learning. Relying solely on routine or superficial tasks may limit students' intellectual growth. In contrast, introspective learning experiences that prompt students to think deeply about how they learn can significantly contribute to their academic development. These practices promote an active learning environment where learners take ownership of their educational journeys. Teachers have a vital role in shaping this learning environment. By modelling effective learning techniques, problem-solving strategies, and reflective practices, educators influence students far beyond the immediate classroom experience. Furthermore, supporting students in identifying and refining their personal learning styles and strategies helps them become more autonomous and resilient learners.

In conclusion, embedding reflective and metacognitive practices into regular classroom activities is crucial for promoting meaningful and enduring learning. Teachers act not only as content deliverers but also as facilitators of cognitive and personal development. Through deliberate instructional choices, they can significantly enhance students' capacity to think critically, learn independently, and adapt to new challenges—skills that are increasingly essential in the dynamic and complex world of the 21st century.

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