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METACOGNITIVE AWARENESS OF HIGHER SECONDARY STUDENTS

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Abstract

Metacognition involves understanding one's cognitive processes and the ability to manage and adapt them effectively to improve learning outcomes. It is closely linked to academic success as it empowers students to take control of their learning journey, fostering critical thinking and independence. Proficient students possess skills such as organization, time management, strategic learning, self-monitoring, and adaptability. Acquiring cognitive and metacognitive skills equips students with the means to actively direct and regulate their cognitive processes, akin to developing heightened awareness and reflection throughout their educational journey.

The research examined 479 students from various educational backgrounds in Higher Secondary Schools. Metacognitive awareness was assessed using the Metacognitive Awareness Inventory (MAI) developed by Researcher. The results indicated a significant difference in Metacognitive Awareness among students concerning gender and study stream, suggesting that these factors influence students' awareness of their cognitive processes. However, no significant difference was found based on the medium of instruction, implying that regardless of language, students exhibit similar levels of metacognitive awareness in Higher Secondary education.

Keywords: *Cognitive Reflection, Metacognitive Consciousness, Knowledge of Cognition, Oversight of Cognitive Functions.*

Introduction

"In the journey of education, tomorrow belongs to those who prepare for it today, for education is not merely preparation for life but life itself."
- Malcolm X

Embarking on the pursuit of academic excellence, the passage through higher secondary education represents a pivotal phase where students traverse the bridge to a future filled with myriad possibilities. At the heart of this educational odyssey lies a crucial determinant of success – the emergence of metacognitive awareness among higher secondary students. Echoing the sentiments of philosopher John Dewey, who proclaimed that education is an inseparable part of life, this period becomes a transformative juncture where the ability to navigate and comprehend one's cognitive processes takes center stage.

Metacognition, encompassing the awareness and regulation of one's cognitive functions, assumes a significant role in shaping the educational landscape for higher secondary students. This phase not only signifies the culmination of foundational knowledge but also heralds the blossoming of self-awareness and strategic thinking. As students' progress along the path of academic maturity, the cultivation of metacognitive

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awareness emerges as a guiding light, leading them towards the adoption of effective learning strategies and, ultimately, triumph in their scholastic pursuits. This introduction embarks on an exploration of the inception and evolution of metacognitive awareness among higher secondary students, unraveling the profound impact it exerts on their educational journey.

Review of related Literature

Study	**Participants**	**Findings Regarding Metacognitive Awareness**
Dhyani. R 2018	140 primary-level students of the Dehradun district	18 students had very low awareness, 38 had low awareness, 46 had average awareness, 28 had high awareness, and 10 had very high awareness. No appreciable differences based on location and gender.
Rangannavar. B et al 2018	500 students of the central school of Bidan and Belgaum district	Statistically significant difference in metacognitive awareness between High, Average, and Poor achievers ($F=801.1996$, $p<0.05$). High achievers exhibit higher metacognitive awareness.
Sonowal et al 2019	134 class XII students	No association between knowledge of cognition and academic achievement. Favorable relationship between metacognitive awareness and academic achievement and regulation of cognition. No significant differences based on gender, management style, location, and instructional medium for Upper Secondary level Arts Stream students.
Mithaiwala et al 2020	66 class eleven students of N.N. Ramanathan Lyyer high school	No discernible difference in metacognition awareness between humanities and sciences students. Humanities students ($M=41.60$) have a higher metacognition awareness than science students ($M=36.18$). Positive correlation between Metacognition Awareness and Achievement Motivation. Different values on dimensions of metacognition awareness and achievement motivation for students from both streams.

Sonowal et al 2021 **Rationale**	945 undergraduate students	Negatively skewed distribution of Metacognitive Awareness scores, indicating higher scores for most group members. No appreciable differences in Metacognitive Awareness based on streams, gender, rural/urban background in the Dibrugarh District. Significant correlation between academic performance and knowledge of cognition and regulation of cognition.

and Significance of the Investigation

- Understanding metacognitive awareness deeply reveals effective strategies to enhance learning outcomes among higher secondary students, who, with heightened metacognitive skills, tend to employ effective study techniques, thus contributing to improved academic performance (Efklides, 2011).
- Recognizing individual differences in metacognitive awareness empowers educators to customize teaching methods to cater to diverse cognitive needs, fostering a conducive learning environment that nurtures cognitive growth (Baker, 2017).
- Identifying students with lower levels of metacognitive awareness presents an opportunity for targeted interventions. By designing metacognitive training programs, students' self-regulation and strategic learning skills can be elevated (Dunning, Johnson, Ehrlinger, & Kruger, 2003).
- The higher secondary stage signifies a critical period for cognitive development. Studying metacognitive awareness during this phase offers valuable insights into the evolution of these skills and their overall impact on cognitive growth (Flavell, 1979).
- Metacognitive skills are essential for success in higher education. Thoroughly exploring metacognitive awareness in higher secondary students adequately prepares them for the challenges they will encounter in tertiary education (Artzt, Armour-Thomas, & Curcio, 2008).

Objectives

Examine the disparities in Metacognition Awareness among Higher Secondary Students with respect to

- Gender
- Medium of Instruction
- Stream of Study

Hypothesis

The Metacognitive Awareness levels of Higher Secondary students exhibit no significant difference in relation to variations in

- Gender
- Medium of Instruction
- Stream of Study

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Design and Sample of the study

The study utilized a descriptive survey method, a commonly employed strategy in educational research. This method entails choosing a representative sample from the broader population to draw conclusions and generalize findings. Recognizing the challenges of studying the entire population, a random sample of 479 Higher Secondary students, encompassing both male and female participants, was collected from diverse schools for the research.

Analysis And Inferences

Hypothesis H1

Null Hypothesis: There is no substantial difference in Metacognitive Awareness and its dimensions namely Knowledge of Cognition, Regulation of Cognition of Higher Secondary students with respect to Personal Variable Gender.

Table 5.6

Table Showing t-test for substantial difference between Male and Female students with respect to Metacognitive Awareness and its dimensions of Higher Secondary Students.

Variables	**Gender**				**t value**	**P value**	**Result**
	Female		**Male**				
	Mean	**SD**	**Mean**	**SD**			
Knowledge of Cognition	71.55	6.836	66.86	9.080	6.391	0.000**	S
Regulation of Cognition	129.26	12.520	120.89	15.829	6.384	0.000**	S
Overall Metacognitive Awareness	196.35	17.901	183.56	23.629	6.677	0.000**	S

Based on the statistical analysis conducted, it has been determined that the p-value obtained is less than 0.01. This outcome leads to the rejection of the null hypothesis at the 1% significance level. Specifically, concerning the domains of Knowledge of Cognition, Regulation of Cognition, and overall Metacognitive Awareness, a significant distinction between male and female students among Higher Secondary students has been established. This implies that there are notable differences between male and female students in terms of their understanding of cognition, their ability to regulate cognitive processes, and their overall metacognitive awareness within the context of Higher Secondary education.

Hypothesis H2

Null Hypothesis: There is no substantial difference in Metacognitive Awareness and its dimensions namely Knowledge of Cognition, Regulation of Cognition of Higher Secondary students with respect to Personal Variable Medium of Instruction.

Table 5.6

Table Showing t-test for substantial difference between Tamil and English students with respect to Metacognitive Awareness and its dimensions of Higher Secondary Students.

Variables	Medium of Instruction				t value	P value	Result
	Tamil		English				
	Mean	SD	Mean	SD			
Knowledge of Cognition	71.66	7.345	68.41	8.305	4.463	0.016*	S
Regulation of Cognition	128.45	13.896	124.41	14.558	3.069	0.190	NS
Overall Metacognitive Awareness	195.58	19.859	188.58	21.570	3.636	0.107	NS

The statistical analysis reveals that the p-value obtained for the dimension of Knowledge of Cognition is less than 0.01, leading to the rejection of the null hypothesis at the 1% significance level. This indicates a significant difference between Tamil and English medium students regarding their levels of Knowledge of Cognition within the context of Metacognitive Awareness among Higher Secondary students. It suggests that Tamil and English medium students demonstrate distinct patterns in their understanding of cognitive processes.

However, for the dimension of Regulation of Cognition and overall Metacognitive Awareness, the p-value obtained is greater than 0.05. Consequently, the null hypothesis is accepted at the 5% significance level. This implies that there is no significant difference between Tamil and English medium students in terms of their regulation of cognitive processes and overall Metacognitive Awareness among Higher Secondary students.

Hypothesis H3

Null Hypothesis: There is no substantial difference in Metacognitive Awareness and its dimensions namely Knowledge of Cognition, Regulation of Cognition of Higher Secondary students with respect to Personal Variable Stream of Study.

Table 5.6

Table Showing t-test for substantial difference between Arts and Science students with respect to Metacognitive Awareness and its dimensions of Higher Secondary Students.

Variables	Stream of Study				t value	P value	Result
	Arts		Science				
	Mean	SD	Mean	SD			
Knowledge of Cognition	68.24	9.034	123.58	16.376	3.306	0.001**	S
Regulation of Cognition	70.74	7.285	127.68	12.890	3.035	0.000**	S

Overall Metacognitive Awareness	187.56	24.445	194.00	18.513	3.251	0.000**	S

Based on the statistical analysis conducted, it has been observed that the p-value obtained is less than 0.01. Consequently, the null hypothesis is rejected at the 1% significance level in relation to Knowledge of Cognition, Regulation of Cognition, and overall Metacognitive Awareness. Therefore, it can be inferred that there exists a significant difference between Arts and Science students concerning their levels of Knowledge of Cognition, Regulation of Cognition, and overall Metacognitive Awareness among Higher Secondary students. This suggests that Arts and Science students exhibit distinguishable patterns in their understanding of cognition, ability to regulate cognitive processes, and overall metacognitive awareness within the context of Higher Secondary education.

Findings and Discussion of the study

Null Hypothesis	Variable	Difference	Discussion
Rejected	Metacognitive Awareness (Gender)	Significant Difference	The null hypothesis rejection suggests a significant dissimilarity in Metacognitive Awareness between male and female students. This underscores the influence of gender on shaping Metacognitive Awareness levels among Higher Secondary students. Further investigation into contributing factors may be warranted to understand these differences more comprehensively.
Accepted	Metacognitive Awareness (Medium of Instruction)	No significant difference	Accepting the null hypothesis indicates that there is no notable distinction in Metacognitive Awareness based on the medium of instruction. This implies consistent levels of Metacognitive Awareness regardless of language of instruction in the Higher Secondary education context.
Rejected	Metacognitive Awareness	Significant Difference	The null hypothesis rejection highlights a significant

	(Stream of Study)		difference in Metacognitive Awareness between Arts and Science students. This emphasizes the impact of chosen study stream on Metacognitive Awareness levels among Higher Secondary students. Further exploration into contributing factors may be essential for a deeper understanding of these disparities.

Delimitation of the Study

- The data was exclusively gathered from the population of Higher Secondary Students.
- The data was specifically collected from Chennai district.

Educational Implications

The study underscores the crucial role of Metacognitive Awareness in shaping education, emphasizing its importance for effective teaching and learning. Educators have the opportunity to improve students' metacognitive skills by adopting a comprehensive approach within the classroom. This includes integrating Metacognitive Training Programs and reflective practices into various learning activities, aiming to foster self-awareness and critical thinking among students. Furthermore, establishing a robust support system for students to seek guidance on metacognitive processes is essential for their overall development. To ensure the successful implementation of these strategies, conducting workshops for teachers is vital, enhancing their understanding of metacognitive skills and providing them with the necessary tools to support students' growth. Redesigning assessments to explicitly incorporate metacognitive components encourages students to reflect on their learning experiences, promoting deeper understanding and metacognitive awareness. Additionally, collaborative learning activities create an environment where students can openly share and discuss their metacognitive processes, enhancing their learning journey. Leveraging technology tools, such as online journals for reflection, offers an additional avenue for boosting metacognitive development. Lastly, providing constructive feedback that highlights metacognitive strategies helps students refine their learning approach. By implementing these strategies collectively, educators can create a holistic learning environment that nurtures metacognitive skills and enhances students' self-awareness throughout their educational journey.

Conclusion

In summary, fostering metacognitive awareness in higher secondary students is pivotal for both academic achievement and personal growth. Through the implementation of personalized approaches like reflective practices, teacher support, and technology integration, educators play a pivotal role in enabling students to grasp and improve their cognitive processes. This elevated metacognitive awareness not only

positively influences academic performance but also instills essential skills for continuous learning and self-regulation, laying a foundation for lifelong success.

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