A Comparative Study of Metacognitive Abilities among Senior Secondary School Students

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Abstract

Metacognitive abilities are increasingly recognized as a progressive framework for senior secondary education. This study aimed to assess the metacognitive abilities of senior secondary students in the Budaun district. A representative sample of 248 students was selected using Systematic Random Sampling. The researcher adopted a survey method, utilizing the Metacognition Inventory (MCI) developed by Dr. PunitaGovil as the sole instrument for data collection. Data analysis was conducted using mean, standard deviation, and t-test. The findings indicated no significant difference in metacognitive abilities between male and female students at the senior secondary level. However, significant differences were found between students from urban and rural backgrounds, as well as between those studying in arts and science streams.

Keywords- *Metacognitive abilities, Senior secondary education, Arts and science streams.*

Introduction:

In today's rapidly evolving educational landscape, the focus has shifted from rote memorization and passive learning to fostering critical thinking, self-awareness, and independent learning. Among the most vital competencies in this context are *metacognitive abilities*—the capacity to think about one's own thinking. Metacognition, often described as "thinking about thinking," encompasses a range of self-regulatory processes including planning, monitoring, evaluating, and adjusting one's cognitive strategies to optimize learning and problem-solving. These abilities are essential not only for academic success but also for lifelong learning, as they empower students to become autonomous, reflective learners.

At the senior secondary level, where academic demands intensify and learners are expected to take greater responsibility for their learning outcomes, the development of metacognitive abilities becomes particularly critical. Students with strong metacognitive skills are better equipped to assess their understanding, identify gaps in their knowledge, and adapt their learning strategies accordingly. Despite their importance, metacognitive abilities are often underemphasized in traditional education systems, especially in environments focused predominantly on content delivery and examination performance.

This paper explores the concept and significance of metacognitive abilities among senior secondary students, with particular attention to factors such as gender, geographic background, and academic stream. By examining these variables, the study aims to shed light on the current state of metacognitive development in students and highlight the need for educational practices that nurture self-regulated learning.

Review of Related Literature:

Zimmerman (2002) emphasized the importance of self-regulated learning, noting that students who possess strong metacognitive skills tend to set goals, monitor their progress, and

reflect on their learning experiences more effectively than their peers. His work has been instrumental in shaping educational interventions aimed at improving metacognitive awareness in classrooms.

Govil and Shrimali (2011) conducted a study to assess metacognitive awareness among secondary school students and found a positive correlation between metacognitive skills and academic performance. They also observed that students in urban areas exhibited higher levels of metacognitive awareness than those in rural areas, highlighting the influence of environmental factors on metacognitive development.

Adeyemi (2015) examined gender differences in metacognitive strategy use among secondary school students in Nigeria. Results showed no significant gender difference overall, but girls were slightly more inclined to use self-monitoring and planning strategies than boys.

Efklides (2019) expanded on the cognitive aspects of metacognition by incorporating emotional and motivational components, showing that students' beliefs about their abilities and task value also influence metacognitive regulation. This holistic view contributed to understanding how self-efficacy and metacognition interact.

Devi and Fernandes (2023) explored the relationship between metacognition and academic resilience among senior secondary students. Their study concluded that higher levels of metacognitive awareness are associated with increased academic resilience, suggesting that metacognitive skills enable students to better cope with academic challenges

Akubo, Oyetunde, and Anyebe (2024) investigated the impact of metacognitive strategies on reading comprehension among senior secondary students in Nigeria. The study revealed that students trained in metacognitive techniques achieved significantly higher scores in both literal and inferential comprehension, emphasizing the effectiveness of these strategies in enhancing reading skills.

Meher et al. (2024) examined the influence of metacognitive strategies on the self-efficacy of higher secondary students. Utilizing a quasi-experimental design, the research found that students who received metacognitive training exhibited enhanced general and social self-efficacy, highlighting the interconnection between metacognitive practices and students' belief in their capabilities.

There is no evidence that students' metacognitive ability has a major impact on academic success and gender.

Statement of the problem:

"A Comparative Study of Metacognitive Abilities among Senior Secondary Students."

Objectives of the study

1. To find out the difference in the metacognitive abilities of higher secondary students in relation to their locality.
2. To find out the difference in the metacognitive abilities of higher secondary students with based on their gender.

3. To find out the difference in the metacognitive abilities of higher secondary students with regard to their academic stream.

Hypothesis of the study:

1. There is no significant difference in metacognitive abilities between boys and girls students of sr. secondary school.
2. There is no significant difference in metacognitive abilities between rural and urban students of sr. secondary school.
3. There is no significant difference in metacognitive abilities between the arts and science stream of education of sr. secondary school.

Delimitation of the study:

1. The sample of the present study was taken from Budaun District only.
2. Only 248 samples were studied during the investigation.
3. The researcher used a Metacognition Inventory (MCI) developed by PunitaGovil questionnaire only for this study.

The researcher employed the mean, standard deviation and t-test as statistics.

The present research work was delimited to the sr. secondary school students only.

Operational definition of key terms:

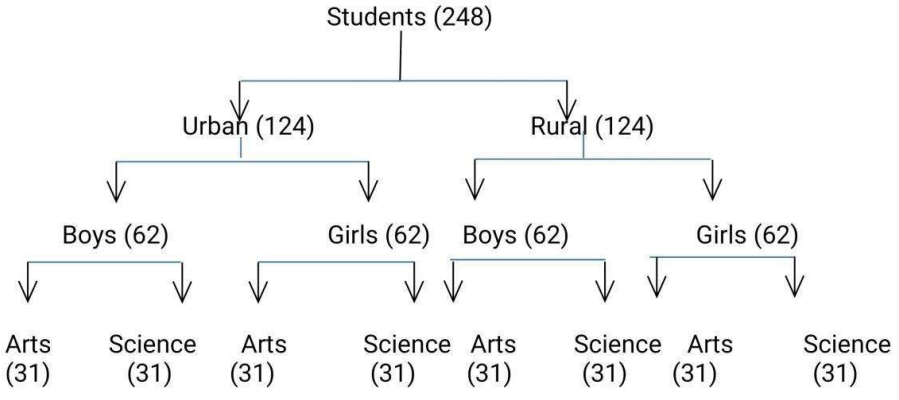
- **Metacognition**: "Metacognition refers to one's knowledge concerning one's own cognitive processes or anything related to them."*(Flavell, 1976)*
- **Sr. Secondary Students**: By secondary students we mean a student of class 11th and 12th.

Methodology:

Research Method: As a research method, the researcher adopted the Descriptive Survey Method as well as the quantitative research approach for this present study.

Sample and Sampling: A total of 304 students were chosen as part of the sample. For this study, the researcher employed the Systematic Random Sampling approach.

Diagram No 1



Population: The study's target demographic is all UP (India) Sr. Secondary students (classes 11 and 12).

Sample: Diagram No 1: Sample distribution according to various independent variables.

Tools: The Metacognition Inventory (MCI) created by PunitaGovil was utilised to complete the current investigation. There are 30 items in the Inventory. This tool assesses cognitive processes and cognitive control.

Testing the hypothesis:

HYPOTHESIS - 1: There is no significant difference in metacognitive abilities between urban and rural students of sr. secondary school.

Table No. 1

Comparison of metacognitive abilities between urban and rural students of sr. secondary school of Budaun district

S. No.	Group	N	Mean	S.D.	d.f.	"t" Value	Level of Significance
1	Urban	124	90	9.27	246	7.61	Significant Difference
2	Rural	124	84	11.34			

Analysis: From the table – 1.0 it can be observed that the mean score of urban students is 90 with an S.D. of 9.27, while mean of rural students is found to be 84 with an S.D. of 11.34. The calculated t-value is 7.61 and't-table' that the critical value of t with 246 degrees of freedom (df) at a 0.05 level of significance is 1.96 and the 0.01 level of significance is 2.58.

Interpretation: Since, the calculated t-value is greater than tabulated t value which is significant at both levels. Hence, the null hypothesis is rejected. It indicates that there is a significant difference in metacognitive abilities between Urban and Rural students of sr. secondary school.

HYPOTHESIS - 2: There is no significant difference in metacognitive abilities between boys and girls students of sr. secondary school.

Table No. 2

Comparison of metacognitive abilities between boys and girls students of sr. secondary school of Budaun district

S. No.	Group	N	Mean	S.D.	d.f.	"t" Value	Level of Significance
1	Boys	124	85	9.37	246	1.55	Not Significant difference
2	Girls	124	83	9.89			

Analysis : From the table – 2.0 it can be observed that the mean score of male students is 85 with an S.D. of 9.37, while mean of female students is found to be 83 with an S.D. of 9.89. The calculated t-value is 1.55 and't-table' that the critical value of t with 246 degrees of freedom (df) at a 0.05 level of significance is 1.96 and the 0.01 level of significance is 2.58.

Interpretation: Since, the calculated t-value is less than tabulated t value which is not significant at any levels. Hence, the null hypothesis is accepted. It indicates that there is no significant difference in metacognitive abilities between boys' and girls' students of sr. secondary school.

HYPOTHESIS - 3: There is no significant difference in metacognitive abilities between Arts and science students of sr. secondary school.

Table No. 3

Comparison of metacognitive abilities between Arts and Science students of sr. secondary school

S. No.	Group	N	Mean	S.D.	d.f.	"t" Value	Level of Significance
1	**Arts**	124	89	10.03	246	3.30	Significant difference
2	**Science**	124	85	9.04			

Analysis: From the table – 3.0 it can be observed that the mean score of Arts students is 89 with an S.D. of 10.03, while mean of Science students is found to be 85 with an S.D. of 9.04. The calculated t-value is 3.30 and't-table' that the critical value of t with 246 degrees of freedom (df) at a 0.05 level of significance is 1.96 and the 0.01 level of significance is 2.58.

Interpretation: Since, the calculated t-value is greater than tabulated t value which is significant at both levels. Hence, the null hypothesis is rejected. It indicates that there is a significant difference in metacognitive abilities between Arts and Science students of sr. secondary school.

Findings of the study:

- There is a significant difference in metacognitive abilities between urban and rural students of sr. secondary school.
- There is no significant difference in metacognitive abilities between boys' and girls' students of sr. secondary school.
- There is significant difference in metacognitive abilities between the arts and science stream students of sr. secondary school.

Conclusion:

Metacognitive abilities play a pivotal role in enhancing students' learning processes, academic performance, and lifelong problem-solving skills. This research highlights the importance of students being aware of and actively managing their cognitive processes through planning, monitoring, and evaluating their understanding. While many students demonstrate strong metacognitive strategies during pre-reading activities, the underutilization of supportive strategies during reading itself suggests a gap in application that needs to be addressed. Strengthening metacognitive instruction in educational settings can empower learners to become more self-regulated and independent, ultimately leading to deeper comprehension and improved retention. Future studies should explore practical interventions and training methods to foster these skills across diverse learning environments and age groups.

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