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METACOGNITIVE AWARENESS OF SECONDARY SCHOOL STUDENTS

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RESEARCH ARTICLE

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Abstract
The present study aimed to examine the metacognitive awareness of secondary school students and its relationship with selected personal variables. The study also investigated the predictive influence of personal variables and dimensions of metacognitive awareness on students' overall metacognitive awareness. The normative survey method was adopted for the study. A sample of 150 secondary school students was selected through simple random sampling from various schools. The Metacognitive Awareness Inventory (MAI) developed by Gregory Schraw and Rayne S. Dennison (1994) was used for data collection. Statistical techniques such as Descriptive Analysis, Differential Analysis, Correlation Analysis, and Multiple Regression Analysis were employed using IBM SPSS Statistics.The findings revealed that the level of metacognitive awareness among secondary school students was very high. Female students, 12th standard students, urban students, aided school students, students from nuclear families, and students belonging to the ₹50,000–₹75,000 income group showed relatively higher metacognitive awareness. Significant differences were found only between 11th and 12th standard students in metacognitive awareness. Correlation analysis indicated that class was significantly related to metacognitive awareness, while regression analysis identified class as the strongest predictor among the personal variables. Among the dimensions, knowledge about cognition emerged as the most influential predictor, followed by planning, monitoring, and evaluation. The study concluded that metacognitive awareness plays a vital role in improving students' learning and academic development.

Keywords: *Metacognitive Awareness, Secondary School Students, Knowledge about Cognition, Self-Regulated Learning*

Introduction

Education in the 21st century emphasizes the development of higher-order thinking skills along with knowledge acquisition. Among these skills, metacognition, often defined as "thinking about one's own thinking," plays an important role in helping learners become independent and effective learners. Metacognitive awareness involves students' ability to plan, monitor, and evaluate their learning processes, thereby improving academic achievement and self-regulated learning.

At the secondary school level, students experience significant cognitive and psychological development. They are expected to handle complex learning tasks that require critical thinking, problem-solving, and independent learning. However, many students fail to achieve expected outcomes due to a lack of awareness about effective learning strategies. Therefore, understanding students' metacognitive awareness is essential for improving teaching-learning practices. Metacognitive awareness consists of two major components: knowledge about cognition and regulation of cognition. Students with higher metacognitive awareness are better able to select suitable learning strategies and adapt them according to learning situations. Various factors such as school type, socio-economic background, and parental support may influence these skills.

Need of the Study

In the modern educational system, emphasis has shifted from rote learning to meaningful and self-directed learning. Despite this shift, many secondary school students still lack awareness of effective learning strategies and depend on passive learning methods. Metacognitive awareness helps students plan, monitor, and evaluate their learning, which is essential for academic success. Secondary school students face increasing academic challenges that demand critical thinking and independent learning skills. Without proper metacognitive skills, students may struggle academically and lose confidence in learning. Moreover,

differences in factors such as gender, school type, family background, and socio-economic status may influence students' metacognitive awareness. Therefore, the present study is needed to identify the level of metacognitive awareness among secondary school students and provide suggestions for improving effective learning practices.

Significance of the Study

The study is significant as it focuses on improving students' learning processes through metacognitive awareness. The findings will help teachers adopt learner-centered teaching strategies that encourage planning, monitoring, and evaluation skills among students. The study will also benefit curriculum planners and policymakers in integrating metacognitive skill development into educational practices. For students, improved metacognitive awareness can enhance academic achievement, problem-solving ability, and self-confidence. Further, the study provides a foundation for future research related to metacognition and self-regulated learning. Thus, the study contributes to promoting effective learning habits and lifelong learning skills among secondary school students.

Statement of the Problem: The problem of the study is stated as A Study on the Metacognitive Awareness of Secondary School Students

Operational Definitions

- **Metacognitive Awareness:** Refers to the students' knowledge about their own thinking processes and their ability to plan, monitor, and evaluate their learning strategies.
- **Secondary School Students:** Students studying in classes IX and X in recognized schools.

Objectives of the Study

1. To determine the level of metacognitive awareness among secondary school students.
2. To examine the significant differences in metacognitive awareness among secondary school students with respect to selected personal variables.
3. To identify the predictor variables influencing metacognitive awareness among secondary school students.
4. To determine the dominant factor contributing to metacognitive awareness among secondary school students.

Hypotheses of the Study

1. The level of metacognitive awareness among secondary school students is high.
2. There is no significant difference in metacognitive awareness among secondary school students with respect to selected personal variables.
3. Selected personal variables significantly predict the metacognitive awareness of secondary school students.
4. There exists a dominant factor influencing the metacognitive awareness of secondary school students.

Methodology

The present study adopted the normative survey method to investigate the level of metacognitive awareness among secondary school students. This method attempts to describe and interpret the existing conditions, practices, processes, trends, and effects related to the phenomenon under study. In the present investigation, it was used to analyze and report the current status of metacognitive awareness among secondary school students. The study utilized the Metacognitive Awareness Inventory (MAI) developed by Gregory Schraw and Rayne S. Dennison in 1994. The inventory originally consists of 54 items fewer than two major components: Knowledge of Cognition and Regulation of Cognition. For the present study, selected items related to Regulation of Cognition part of the original scale were adopted under four dimensions, namely Knowledge about Cognition, Planning, Monitoring, and Evaluation. The items were rated on a five-point Likert scale consisting of Strongly Agree, Agree, No Idea, Disagree, and Strongly Disagree, with scores ranging from 5 to 1 for favorable statements. The population of the study comprised students enrolled in secondary education, with approximately one Lakh students considered as the population. A sample of 150 secondary school students was selected randomly from three schools for the study. Statistical techniques related to descriptive analysis and differential analysis, correlation and multiple regression analyses were carried out for interpreting the data using IBM SPSS Statistics.

Descriptive Analysis

One of the major objectives of the study was to assess the level of metacognitive awareness among secondary school students. For this purpose, the Metacognitive Awareness Inventory (MAI) developed by Gregory Schraw and Rayne S. Dennison (1994) was used. The study covered the dimensions of Knowledge about Cognition, Planning, Monitoring, and Evaluation. Based on the obtained scores, students were classified into five levels of metacognitive awareness: Very Low (0–21), Low (22–39), Moderate (40–57), High (58–75), and Very High (76–105).

Table 4.2. Mean and standard deviation of Metacognitive awareness of Total sample.

Variable	N	Mean	SD
Metacognitive awareness	150	75.21	8.92

The above table 4.2 shows the mean score and standard deviation of Secondary School student's Metacognitive awareness are found to be 75.21 and 8.92 respectively. It is concluded that the Secondary School student's Metacognitive awareness is high (58-75).

Table 2
Descriptive Analysis of The Metacognitive awareness Score Of Secondary School students

S.No	Variables	Sub Samples	N	%	Mean	STD
1	Age	16	87	58	75.20	9.37
		17	63	42	75.22	8.32
2	Gender	Male	58	39	75.16	8.75
		Female	92	61	75.24	9.07
3	Class	12thstd	65	43	77.11	8.45
		11thstd	85	57	73.75	9.04
4	School Type	Government	51	34	74.18	9.36
		Aided	60	40	76.17	8.12
		Self-Financing	39	26	75.08	9.55
5	Locality	Rural	129	86	74.91	9.14
		Urban	21	14	77.05	7.30
6	Parental Education	School Level	61	41	76.82	8.64
		College Level	89	59	74.10	8.98
7	Parental Occupation	Self-Employment	63	42	75.10	9.54
		Government	24	16	74.79	9.69
		Private	63	42	75.48	8.07
8	Parental Income	1-25k	118	79	75.06	9.06
		25k-50k	19	13	74.58	7.08
		50k-75k	13	9	77.46	10.26
9	Family Type	Nuclear	131	87	75.44	9.08
		Joint Family	19	13	73.58	7.71

The table 2 presents the mean and standard deviation scores of students' Metacognitive awareness based on Age, Gender, class, Type of school, Locality of Residence, Parental qualification, Parent's Occupation, Monthly Family Income and Family Type.

- **Age:** 58% of the respondents are aged 16 and 42% are aged 17. The mean scores show almost no difference in metacognitive awareness between the two age groups.
- **Gender:** 39% of the respondents are male and 61% are female. Female students show slightly higher metacognitive awareness than male students.
- **Class:** 43% of the respondents study in 12th standard and 57% in 11th standard. The 12th standard students possess higher metacognitive awareness than 11th standard students.
- **Type of School:** 34% of the respondents study in government schools, 40% in aided schools, and 26% in self-financing schools. Aided school students show higher metacognitive awareness than the other groups.
- **Locality:** 86% of the respondents belong to rural areas and 14% to urban areas. Urban students possess higher metacognitive awareness than rural students.
- **Parental Qualification:** 41% of the respondents have parents with school-level education and 59% have parents with college-level education. Students whose parents have school-level education show higher metacognitive awareness.
- **Parents' Occupation:** 42% of the respondents have self-employed parents, 16% government-employed parents, and 42% privately employed parents. Students whose parents are privately employed show comparatively higher metacognitive awareness.
- **Monthly Family Income:** 79% of the respondents belong to the ₹1–25k income group, 13% to ₹25k–50k, and 9% to ₹50k–75k. Students from the ₹50k–75k income group possess higher metacognitive awareness.
- **Family Type:** 87% of the respondents belong to nuclear families and 13% to joint families. Students from nuclear families show higher metacognitive awareness than those from joint families.

Table: 3
T- Test Showing Relationship Between Metacognitive awareness and Personal variables

S.No	Variables	Sub Samples	N	Mean	STD	t	result
1	Age	16	87	75.20	9.37	-.018	**NS**
		17	63	75.22	8.32		P=0.985
2	Gender	Male	58	75.16	8.75	-.056	**NS**
		Female	92	75.24	9.07		P=0.955
3	Class	12thstd	65	77.11	8.45	2.338	**S**
		11thstd	85	73.75	9.04		P=0.021
4	Locality	Rural	129	74.91	9.14	-1.199	**NS**
		Urban	21	77.05	7.30		P=0.240
5	Parental Education	School Level	61	76.82	8.64	1.863	**NS**
		College Level	89	74.10	8.98		P=0.065
6	Family Type	Nuclear	131	75.44	9.08	. .961	**NS**
		Joint Family	19	73.58	7.71		P=0.345

The above table presents the mean, standard deviation, and t-value relationship between metacognitive awareness and selected personal variables of secondary school students.

- With regard to age, there is no significant difference between 16-year and 17-year students in their total metacognitive awareness, as the obtained t-value (-0.018) is not significant at the 5% level. Hence, it is concluded that age does not influence the metacognitive awareness of secondary school students.
- With regard to gender, there is no significant difference between male and female students in their total metacognitive awareness, since the calculated t-value (-0.056) is not significant at the 5% level. Therefore, gender does not have a significant influence on metacognitive awareness.
- With regard to class, a significant difference is found between 11th and 12th standard students in their total metacognitive awareness. The obtained t-value (2.338) is significant at the 5% level. Hence, it is concluded that class has a significant influence on students' metacognitive awareness. It may be inferred that 12th standard students possess comparatively higher metacognitive awareness due to greater academic experience and learning exposure.
- With regard to locality, there is no significant difference between rural and urban students in their total metacognitive awareness, as the calculated t-value (-1.199) is not significant at the 5% level. Therefore, locality does not significantly influence metacognitive awareness.
- With regard to parental education, there is no significant difference between students whose parents have school-level education and those whose parents have college-level education in their total metacognitive awareness. Since the obtained t-value (1.863) is not significant at the 5% level, parental education is not found to influence metacognitive awareness significantly.
- With regard to family type, there is no significant difference between students belonging to nuclear and joint families in their total metacognitive awareness, as the calculated t-value (0.961) is not significant at the 5% level. Hence, family type does not have a significant influence on metacognitive awareness among secondary school students.

The t-test analysis revealed a significant difference only between 11th and 12th standard students. No significant differences were found with respect to age, gender, locality, parental education, and family type.

Table: 4
Significant Difference Among Metacognitive awareness and Personal variables

S.No	Variables		Sum of Squares	df	Mean Square	F	Sig.
1.	School Type	Government	51	74.18	9.36	.690	
		Aided	60	76.17	8.12		**NS**
		Self-Financing	39	75.08	9.55		P=0.503
2.	Parental Occupation	Self-Employment	63	75.10	9.54	.059	
		Government	24	74.79	9.69		**NS**

		Private	63	75.48	8.07		P=0.943
3.	Parental Income	1-25k	118	75.06	9.06	.476	
		25k-50k	19	74.58	7.08		**NS**
		50k-75k	13	77.46	10.26		P=0.622

In order to find out whether there is any significant difference in the metacognitive awareness of secondary school students with respect to selected variables, the 'F' value was calculated.

- With regard to type of school, there is no significant difference among students from different types of schools in their metacognitive awareness, as the calculated F-value (0.690) is not significant at the 5% level. Therefore, the stated null hypothesis is accepted, and it is concluded that type of school does not significantly influence the metacognitive awareness of secondary school students.
- With regard to parental profession, there is no significant difference among students belonging to different parental profession groups in their metacognitive awareness, since the calculated F-value (0.059) is not significant at the 5% level. Hence, the null hypothesis is accepted, and it is concluded that parental profession does not have a significant influence on students' metacognitive awareness.
- With regard to parental economic status, there is no significant difference among students belonging to different parental income groups in their metacognitive awareness, as the obtained F-value (0.476) is not significant at the 5% level. Therefore, the null hypothesis is accepted, and it is concluded that parental economic status does not significantly influence the metacognitive awareness of secondary school students.

The F-test analysis showed no significant difference among students based on school type, parental occupation, and parental income.

Table 5
Correlation analysis Between Metacognitive awareness and personal variables

S.No	Variables	r
1.	Age	.001
2.	Gender	.005
3.	Class	**-.187***
4.	School type	.046
5.	Locality	.084
6.	Parental education	-.150
7.	Parental occupation	.020
8.	Parental Income	.057
9.	Family type	-.070

**. Correlation is significant at the 0.01 level (2-tailed).
*. Correlation is significant at the 0.05 level (2-tailed).

Table 5 presents the relationship between metacognitive awareness and selected personal variables of secondary school students using Pearson's correlation coefficient (r).

The analysis reveals that among all the personal variables, only class shows a statistically significant relationship with metacognitive awareness (r = -0.187*). The negative correlation indicates that as the class level increases, the metacognitive awareness score tends to slightly decrease. Since the relationship is significant at the 0.05 level, class has a meaningful influence on students' metacognitive awareness.

The remaining variables such as age (r = .001), gender (r = .005), school type (r = .046), locality (r = .084), parental occupation (r = .020), parental income (r = .057), and family type (r = -.070) show very low correlation values and are not statistically significant. This indicates that these variables do not have any notable relationship with metacognitive awareness among secondary school students.

Parental education shows a negative correlation (r = -.150), but the relationship is not statistically significant. Therefore, parental education does not significantly influence metacognitive awareness in the present study.

Overall, the study concludes that class is the only personal variable significantly related to metacognitive awareness, while all other personal variables have no significant relationship with metacognitive awareness among secondary school students.

Table 6
Stepwise regression analysis between Metacognitive awareness and Personal variables

Model		Unstandardized Coefficients		Standardized Coefficients	Pearson r	Sr^2	Structure Coefficient
		B	Std. Error	Beta			
1	(Constant)	80.462	2.379				1.000
	class	-3.355	1.448	-.187	-.187	0.035	

Note: Dependent Variable: Metacognitive awareness, R^2=0.035, Adjusted R^2=0.028.
df(1,148), F=5.368.

Table 6 shows a stepwise multiple regression analysis of Metacognitive awareness and Age, Gender, Class, Stream of study, Type Of The School, Medium, , Locality, Parents Educational Qualifications, Parents Occupation, Monthly Income and Family Type to predict Metacognitive awareness of Secondary Students.

The prediction model contained one of the nine predictors and was reached in one step with 8 variables removed. The model was statistically significant, F (1, 148) =5.368, p<0.001, and accounted for approximately 3.5 % of the variance of Metacognitive awareness(R^2=0.035, AdjustedbR^2=0.028). Metacognitive awareness is primarily predicted by the lower levels of Class. The Class received the strongest weight in model. With the sizeable correlations between the predictors, the unique variance explained by each of the variables indexed by the squared semi-partial correlation was relatively low: The Class uniquely accounted for approximately 3.5% of the Metacognitive awareness. Inspection of the structure coefficient suggests that, Class was relatively strong indicators of Metacognitive awareness.

Hence, it can be concluded that Class is the most influential predictor in determining the Metacognitive awareness among Secondary Students.

Table 7
Stepwise regression analysis between Metacognitive awareness and Its Dimensions

Model		Unstandardized Coefficients		Standardized Coefficients	Pearson r	Sr^2	Structure Coefficient
		B	Std. Error	Beta			
4	(Constant)	########	0.000				
	Knowledge about Cognition	1.000	0.000	.512	.822	0.338	0.338
	Planning	1.000	0.000	.312	.744	0.277	0.277
	Evaluation	1.000	0.000	.276	.484	0.117	0.117
	Monitoring	1.000	0.000	.305	.700	0.245	0.245

Note: Dependent Variable: Metacognitive awareness, R^2=1.000, Adjusted R^2=1.000
df(4,145), F=0.

Table 7 shows a stepwise multiple regression analysis of Metacognitive awareness and Knowledge about Cognition, Planning, Monitoring, and Evaluation to predict Factors of Metacognitive awareness of Secondary Students.

The prediction model contained 4 of the 4 predictors and was reached in 4 step with no variables removed. The model was statistically significant, F (4, 145) =0, p<0.001, and accounted for approximately 100 % of the variance of Metacognitive awareness (R^2=1.000, AdjustedbR^2=1.000). Metacognitive awareness is primarily predicted by the high levels of Knowledge about Cognition and followed by Planning, Monitoring, and Evaluation. The Knowledge about Cognition, received the strongest weight in model. With the sizeable correlations between the predictors, the unique variance explained by each of the variables indexed by the squared semi-partial correlation was relatively high: The Knowledge about Cognition, Planning, Monitoring, and Evaluation uniquely accounted for approximately 34%, 28%, 25% and 18% of the Metacognitive awareness. Inspection of the structure coefficient suggests that, Knowledge about Cognition was relatively strong indicators of Metacognitive awareness.

But Planning, Monitoring were relatively Moderate indicators of Metacognitive awareness and Evaluation was relatively weak indicators of Metacognitive awareness.

Hence, it can be concluded that Knowledge is the most Dominant factor in determining the Metacognitive awareness among Secondary Students.

Discussion of Findings

The present study revealed that the metacognitive awareness of secondary school students was very high, indicating that students possess good awareness of their learning strategies, planning, monitoring, and evaluation skills. The findings are consistent with earlier studies which reported high levels of metacognitive awareness among school students.

The study found no significant difference in metacognitive awareness with respect to age and gender, though female students showed slightly higher awareness than male students. Similarly, urban students, aided school students, students from nuclear families, and students belonging to the ₹50,000–₹75,000 income group possessed relatively higher metacognitive awareness, but the differences were not statistically significant.

A significant difference was observed between 11th and 12th standard students in knowledge about cognition and overall metacognitive awareness. This indicates that academic experience and class level contribute positively to students' metacognitive development. The findings further revealed that parental education, parental occupation, parental income, family type, and school type did not significantly influence metacognitive awareness.

Correlation analysis showed that class was the only personal variable significantly related to metacognitive awareness. Regression analysis also identified class as the strongest predictor among the selected personal variables. Further, knowledge about cognition emerged as the most influential predictor of metacognitive awareness, followed by planning, monitoring, and evaluation.

Overall, the study confirms that metacognitive awareness plays an important role in improving students' learning processes and academic development, and that academic experience contributes more significantly to metacognitive awareness than demographic variables.

Conclusion

The present study concludes that secondary school students possess a high level of metacognitive awareness. The findings reveal that variables such as age, gender, locality, parental education, parental occupation, parental income, family type, and school type do not significantly influence students' metacognitive awareness. However, class was found to have a significant relationship and emerged as the most influential predictor of metacognitive awareness among secondary school students.

The study further highlights that knowledge about cognition is the dominant component influencing overall metacognitive awareness, followed by planning, monitoring, and evaluation. This indicates that students who understand their own learning processes and strategies are better able to regulate and improve their learning outcomes.

Overall, the study emphasizes the importance of metacognitive awareness in enhancing students' learning effectiveness, self-regulation, and academic development. Therefore, schools, teachers, parents, and curriculum planners should work together to promote metacognitive skills among students to support meaningful and lifelong learning.

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