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Meta-Cognition: An Empirical Investigation Of Higher Secondary School Students In Relation To Various Background Variables

Sunobar Rashid* Rifat Ara**

* Research Scholar, School of Education, Central University of Kashmir, Jammu and Kashmir, India.
** Research Scholar, Lovely Professional University, Punjab, India.

Abstract

Metacognition means "thinking about one's thinking". There are two aspects of metacognition: - reflection-thinking about what we know and self-regulation managing how we go about learning (Winn and Snyder, 1996). These processes, when combined, constitute an important element of education and growth. Strengthening these cognitive processes' talents entails not only being reflective learners but also learning specialized learning approaches. Some of the terminology that pertains to metacognition includes metacognitive beliefs, metacognitive awareness, metacognitive experiences, metacognitive knowledge, metacognitive skills, executive abilities, higher-order skills, meta components, and memory retention. Being aware of how you think is what metacognitive awareness entails. Metacognition is the awareness of one's thoughts and strategies. It allows students to be more conscious of the things they are doing and the cause they are doing, as well as how those abilities they are acquiring may be implemented differently in other circumstances. The investigators in this paper try to analyze the metacognitive awareness of higher secondary school students. The metacognitive awareness scale developed and standardized was used by Gupta and Suman (2017) to check the metacognitive awareness of higher secondary school students. The study tries to find out whether there exists any significant difference in their metacognitive awareness based on gender, type of school and Stream among higher secondary school students. The investigators use appropriate statistical techniques like mean, standard deviation, and t-test for the analysis of the data.

Key Words: Metacognition; Metacognitive Awareness; Higher Secondary School Students

Introduction

One of the most prominent recent buzzwords in the psychology of education is metacognition. It has already been over thirty years since John Flavell introduced metacognition into the field of psychology in 1979. Metacognition research began with John Flavell, who is considered the 'father of the field,' and since then, a vast number of research findings and theoretical works about metacognition have been collected. Metacognition is a term that has been employed to describe multiple scientific approaches. Metacognition is

essentially intellect about understanding; that is, it pertains to second-order mental activities: thoughts about thoughts, expertise about knowledge, or observations on movements. So, if cognition consists of perceiving, knowing, remembering, and so on, metacognition involves concentrating on one's perceiving, knowledge, remembering, and so on. The behaviors that can be considered suitable and pertinent for improving proficiency on an identified training project (Rain et al., 2022). In Metacognition the methods of planning, monitoring, and regulating thoughts are generally involved, which involve the interaction of two levels: At one level is the creative, associative, wandering mind, and above it is the executive, trying to keep it on task. Gradually, the concept has been broadened to include anything psychological rather than just anything cognitive. As an example, possessing understanding or knowledge regarding one's personal feelings or justifications with respect to a thought process (e.g., knowing his/her apprehension while tackling a problem on a test paper) might be deemed metacognitive. As per Bartsch & Estes, 1996 by adding to its cognitive domain, the emotional one - refers to the emotions that accompany the cognitive processes and the person's ability to monitor them, as well as the domain of cognitive habits. Metacognitive Awareness plays an essential role in youngsters learning. It can be built inside itself. Those who are conscious of their thought patterns or mental operations will be more in a position to regulate their learning. This is, they may appropriately direct their learning to develop comprehension. They realize when to employ procedures and the proper way to implement them (Sabna & Hameed, 2016).

Literature Review

Montillado and Lovitos (2023) employed the quantitative research design to study metacognitive awareness among junior high school students. Primary data were gathered through the survey questionnaires to 369 respondents. Results revealed metacognitive awareness has a significant relationship with attitude toward communicative approach among junior high School students. Listiana et al., (2022) analyzed the level of metacognitive skills, students' motivation, and communication skills. The findings showed a positive relationship between metacognition and motivation with communication. Khan and Bhat (2020) studied the metacognitive skills of undergraduate students of Kashmir valley and found significant differences on the basis of gender among undergraduate students of kashmir valley. Jaleel (2016) found no significant difference on metacognitive awareness based on gender, locality and type of school.

Significance

In most cases, we are unaware of what we are engaged in while we do it, but if we are not aware of what we are doing, it is difficult to enhance a process that we are involved in the instant. Helping students recognize themselves as learners and take charge of their education is crucial if the primary objective of education is to equip them to be lifelong learners. The bulk of learners learn metacognitive abilities and knowledge on their own, mostly from their teachers, but also from their fellow students and guardians.

However, students' cognitive skills vary significantly. Strengthening cognitive abilities can boost learners' self-confidence. Self-efficacy enhances commitment and learning achievement.

Objectives of the Study

1. To study the metacognitive skills of higher secondary school students.
2. To compare the male and female higher secondary school students on meta-cognitive skills.
3. To compare the Government and Private higher secondary school students on meta-cognitive skills.
4. To compare the Arts and Government higher secondary school students on meta-cognitive skills.

Hypotheses of the Study

1. There is no significant difference between male and female higher secondary school students on meta-cognitive skills.
2. There is no significant difference between government and private higher secondary school students on meta-cognitive skills.
3. There is no significant difference between Arts and Government higher secondary school students on meta-cognitive skills.

Methodology

The study is descriptive in nature. Stratified sampling technique was used to gather data from 200 higher secondary school students through personal visits and online questionnaire distribution from all schools of Kupwara district of Kashmir, India. For the collection of data metacognition scale developed by Gupta and Suman (2017) with 42 items and 4 dimensions was used. The data was analyzed by using Mean, Standard deviation and t-test.

Analysis & Interpretation

Table 1.0: Showing the levels of Meta-Cognitive Skills of Higher Secondary School Students of Central Kashmir (N=200)

Meta-Cognitive Skills	N	Percent
Very High	13	6.5
High	27	13.5
Above Average	100	50.0
Average	55	27.5
Below Average	3	1.5
Low	2	1.0

Very Low	0	0.0
Total	200	100.0

The above table shows the levels of meta-cognitive skills among higher secondary school students. The data reveals that 6.5 % exhibit very high meta-cognitive skills, 13.5 % show high category, 50.0 % have above average category, 27.5 experience average category 1.5 have below average category and only 1.0 % show low category of meta-cognitive skills.

Table 1.1: Showing the levels of Meta-Cognitive Skills of Male and Female Higher Secondary School Students

Meta-Cognitive Skills	**Male**		**Female**	
	N	**Percent**	**N**	**Percent**
Very High	9	9.0	4	4.0
High	13	13.0	14	14.0
Above Average	53	53.0	47	47.0
Average	23	23.0	32	32.0
Below Average	1	1.0	2	2.0
Low	1	1.0	1	1.0
Very Low	0	0.0	0	0.0
Total	100	100.0	100	100.0

The above table shows the meta-cognitive skills of male and female higher secondary school students. The data reveals that 9.0% of male and 4.0% of female higher secondary students experience very high meta-cognitive skills. The data reveals that 13.0% of male and 14.0% of female students show high meta-cognitive skills. The data reveals that 53.0% of male and 47.0% of female higher secondary students experience above-average meta-cognitive skills. The data reveals that 23.0% of male and 32.0 % of female higher secondary students experience average meta-cognitive skills. The data reveals that 1% of male and female students show low meta-cognitive skills.

Table 1.2: Showing the levels of Meta-Cognitive Skills of Government and Private Higher Secondary School Students

Meta-Cognitive Skills	Government		Private	
	N	Percent	N	Percent
Very High	8	8.0	5	5.0
High	12	12.0	15	15.0
Above Average	46	46.0	54	54.0
Average	32	32.0	23	23.0
Below Average	2	2.0	1	1.0
Low	0	0.0	2	2.0
Very Low	0	0.0	0	0.0
Total	100	100.0	100	100.0

The above table shows the meta-cognitive skills of government and private higher secondary school students. The data reveals that 8.0% of government and 5.0% of private higher secondary students experience very high meta-cognitive skills. The data reveals that 12.0% of government and 15.0% of Private students show high meta-cognitive skills. The data reveals that 46.0% of government and 54.0 % of private higher secondary students experience above-average meta-cognitive skills. The data reveals that 32.0% of government and 23.0 % of private higher secondary students experience average meta-cognitive skills. The data further reveals that only 2% of private students show high meta-cognitive skills.

Table 1.3: Showing the levels of Meta-Cognitive Skills of Arts and Science Higher Secondary School Students

Meta-Cognitive Skills	Arts		Science	
	N	**Percent**	**N**	**Percent**
Very High	7	7.7	6	5.5
High	9	9.9	18	16.5
Above Average	43	47.3	57	52.3
Average	28	30.8	27	24.8
Below Average	3	3.3	0	0.0
Low	1	1.1	1	0.9
Very Low	0	0.0	0	0.0
Total	91	100.0	109	100.0

The above table reveals that 7.7% of Arts and 5.5% of Science higher secondary students experience very high meta-cognitive skills, 9.9% of Arts and 16.5% of Science Students show high meta-cognitive skills. The data reveals that 47.3% of Arts and 52.3 % of Science higher secondary students experience above-average meta-cognitive skills. The data reveals that 30.8% of Arts and 24.8 % of Science higher secondary students experience average meta-cognitive skills. The data reveals that 3.3% of arts students show below-average meta-cognitive skills. The data further reveals that only 1.1 % of Arts and 0.9 % of Science Students show very low meta-cognitive skills.

Table 1.4 Showing the mean difference between Male and Female Higher Secondary School Students on various dimensions of Meta-Cognitive Skills

Meta-Cognitive Skills	Gender	N	Mean	S. D	t-value	Level of Sig.
Planning Skill	Male	100	47.69	7.642	1.96	Sig. at 0.05 level
	Female	100	46.13	8.815		
Implementation Skill	Male	100	38.08	7.861	0.90	Not Significant
	Female	100	39.13	8.523		
Monitoring Skill	Male	100	43.27	7.642	3.30	Sig. at 0.01 level
	Female	100	39.60	8.060		
Evaluation Skill	Male	100	39.37	7.142	0.49	Not Significant
	Female	100	38.86	7.482		
Overall Meta-Cognitive Skills	Male	100	168.41	23.177	1.39	Not Significant
	Female	100	163.72	24.265		

The above table depicts the mean difference between male and female higher Secondary School Students on various dimensions of Meta-Cognitive Skills. The results of meta-cognitive skills on various dimensions were as follows:

The result reveals that there is a significant mean difference between male and female secondary school students in the dimension of planning skill. The obtained 't' value came out to be 1.967 which is significant at 0.05 level. The mean difference favor male Students (47.69) which shows that female students has more planning skills than male students.

The result shows that there is no significant mean difference male and female secondary school students in the dimension of Implementation Skill.

The result reveals that there is a significant mean difference between male and female secondary school students in the dimension of Monitoring Skill. The obtained 't' value came out to be 3.30 which is significant at 0.01 level. The mean difference favour male Students (43.27) which shows that female students has more planning skills than male students.

The result shows no significant mean difference between male and female higher secondary school students in the dimension of Evaluation Skill.

Male and female secondary school students have been compared on all dimensions of meta-cognitive skills. The data reveals that male and female higher secondary school students differ in planning skill and monitoring skill but male and female students does not differ significantly in all overall dimensions of meta-cognitive skills.

Table 1.5 Showing the mean difference between Government and Private Higher Secondary School Students on various dimensions of Meta-Cognitive Skills

Dimensions	Type of School	N	Mean	S.D	t-value	Level of Sig.
Planning Skill	Government	100	45.21	8.867	2.96	Sig. at 0.01 level
	Private	100	48.61	7.271		
Implementation Skill	Government	100	38.70	8.023	0.16	Not Significant
	Private	100	38.51	8.402		
Monitoring Skill	Government	100	40.89	8.751	0.95	Not Significant
	Private	100	41.98	7.279		
Evaluation Skill	Government	100	39.35	7.883	0.45	Not Significant
	Private	100	38.88	6.697		
Overall Meta-Cognitive Skills	Government	100	164.15	24.323	1.14	Not Significant
	Private	100	167.98	23.195		

The above table depicts the mean difference between Government and Private higher Secondary School students on various dimensions of Meta-Cognitive Skills. The results of Meta-Cognitive Skills on various dimensions were as follows:

The result reveals that there is a significant mean difference between Government and Private secondary school students in the dimension of planning skill. The obtained ‘t’ value came out to be 2.96 which is significant at 0.01 level. The mean difference favours Government Students (5.91) which shows that Government Students has more planning skills than private students.

The result shows that there is no significant mean difference Government and Private secondary school students in the dimension of Implementation Skill.

The result also shows that there is no significant mean difference between Government and Private secondary school students in the dimension of Monitoring Skill.

The result shows no significant mean difference between Government and Private secondary school students in the dimension of Evaluation Skill.

Government and Private secondary school students have been compared on all dimensions of Meta-Cognitive Skills. The data reveals that Government and Private secondary school students do not differ significantly in the overall dimensions of Meta-Cognitive Skills.

Table 1.6 Showing the mean difference between Science and Arts Higher Secondary School Students on various dimensions of Meta-Cognitive Skills

Meta-Cognitive Skills	Stream	N	Mean	S.D	**t-value**	**Level of Sig.**
Planning Skill	Arts	91	46.22	8.664	1.07	Not Significant
	Science	109	47.49	7.912		
Implementation Skill	Arts	91	37.41	8.514	1.96	Sig. at 0.05 level
	Science	109	39.61	7.817		
Monitoring Skill	Arts	91	41.04	8.402	0.62	Not Significant
	Science	109	41.76	7.763		
Evaluation Skill	Arts	91	38.77	7.374	0.61	Not Significant
	Science	109	39.40	7.259		
Overall Meta-Cognitive Skills	Arts	91	163.44	25.577	1.43	Not Significant
	Science	109	168.26	22.056		

The above table depicts the mean difference between Arts and Science higher Secondary School Students on various dimensions of meta-cognitive skills. The results of meta-cognitive skills on various dimensions were as follows:

The result reveals that there is no significant mean difference between arts and science secondary school students in the dimension of planning skill.

The result reveals that there is a significant mean difference between arts and science secondary school students in the dimension of Implementation Skill. The obtained‘t’ value came out to be 1.96 which is significant at 0.05 level. The mean difference favor science students (39.61) which shows that science students have more implementation skills than arts students.

The result reveals that there is no significant mean difference between arts and science secondary school students in the dimension of monitoring skill.

The result shows no significant mean difference between arts and science higher secondary school students in the dimension of evaluation skill.

Arts and Science higher secondary school students have been compared on all dimensions of meta-cognitive skills. The data reveals that arts and science higher secondary school students differ in implementation skill but arts and science students does not differ significantly in all overall dimension of meta-cognitive skills.

Discussion

While comparing the male and female higher secondary school students on various dimensions of meta-cognitive skills it was found that they do not differ significantly on meta-cognitive skills. This finding is in line with the findings of Jaleel and pramchandra (2016), Verma & Gupta (2022) who also reported that gender has no influence on meta-cognitive skills. However this finding is in opposite with the findings of Khan and Bhat (2020) who found a significant difference between male and female higher secondary school students on meta-cognitive skills. While comparing the government and private higher secondary school students on various dimensions of meta-cognitive skills it was found that they do not differ significantly on meta-cognitive skills. This finding is in line with the findings of Jaleel and pramchandra (2016) who also reported that type of school has no influence on meta-cognitive skills. While comparing the science and arts higher secondary school students on various dimensions of meta-cognitive skills it was found that they do not differ significantly on meta-cognitive skills. This finding is in consonance with the findings of Jaleel (2016) who also reported that stream has no influence on meta-cognitive skills.

Conclusion

Educators have responsibility for recognizing cultivating, maximizing, and improving every learners' metacognitive talents. Incorporate reflective and strategic learning activities into classroom routines. Asking questions like "What do I know?" might help students improve their own knowledge. What don't I know? What do I need to know? Teachers can guide students in reflecting on their existing knowledge and exploring new topics.

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