

## “A Study on the Metacognitive Awareness of Secondary School Students”

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### ABSTRACT

The present study investigated the level of metacognitive awareness among secondary school pupils, with a particular focus on the impact of school type, gender, and locality. A survey was administered to 120 secondary school students from both government and private institutions, as well as urban and rural areas, to evaluate their metacognitive awareness. The findings indicated that students' levels of metacognitive awareness varied, with 44.2% exhibiting average awareness and 39.2% demonstrating high awareness. One notable distinction between urban and rural pupils was the amount of metacognitive awareness that urban students displayed. Male students, contrary to several earlier studies, showed a far higher degree of awareness than female pupils. The level of metacognitive awareness was also much greater among private school students compared to public school pupils. These results underscore the necessity of targeted interventions to improve metacognitive abilities, particularly among rural students and those enrolled in government institutions. The study suggests policy measures to resolve resource and opportunity gaps in secondary education and recommends additional research into the underlying causes of these disparities.

**Keywords:** Metacognitive, awareness, school, students

### 1.1 Introduction

The foundation of any civilization is its educational system. Having common sense without education is a thousand times better than having both. Those who are unable to learn, unlearn, and relearn will be considered illiterate in the twenty-first century, according to Alvin Toffler, not those who cannot read and write. Metacognition, or understanding how to think, being aware of one's own cognitive processes, and controlling one's own learning processes, is an essential skill for improving education.

Students are able to retain more of what they learn in class when they practice metacognition, which influences their cognitive processes. Students that are adept at using the optimal strategies for learning in different contexts employ metacognition. Metacognition is an approach to education that prioritizes the growth of students' cognitive capacities and processes as a means to enhance their learning. The goal of this objective is to help every student become more independent, flexible, strategic, and productive when it comes to their learning. The theory behind it is that even average students may learn to use certain kinds of thinking strategies that were once reserved for the brightest minds. There is evidence that connecting these strategies to effective learning and problem-solving increases the likelihood of success (vaijayanthi, 2016).

One definition of metacognition is "thinking about thinking." Individuals are able to gain insight into and command over their own cognitive processes through the regulating mechanism known as metacognition. People may take charge of their own learning using metacognition. The term "going meta" is used occasionally while discussing metacognition. The idea is to put yourself in another person's shoes and examine your own thoughts objectively. Putting yourself in the shoes of your audience—specifically, your intellectual audience—is what "going meta" means.

"Metacognition" originally meant being aware of and able to direct one's own cognitive operations while learning.

Understanding how individuals learn, determining what they need to learn, developing solutions to meet those needs, and then putting those solutions into action are all parts of metacognition.

It is common practice to keep the two primary yet interdependent areas of metacognition distinct. For pioneer in the study of memory and metacognition John Flavell, there are two types of knowledge: metacognitive knowledge, which is the capacity to be aware of one's own thinking processes, and metacognitive regulation, which is the capacity to control one's own thinking. The foundation of learning theory is these two parts taken together. In his 1979 work, Flavell categorized metacognitive information into three categories:

- **Awareness of knowledge**-It involves knowing one's interests and where one's expertise is lacking. Being cognizant of the expertise of others might also be included in this group.
- **Awareness of thinking**-Understand the characteristics of mental challenges and the abilities necessary to overcome them.
- **Awareness of thinking strategies**-knowing methods for directing learning (Dhyani & Maikhuri, 2018).

### Metacognitive Strategies

If a student knows his own thought processes, he may use that information to direct and manage his own learning. An other term for this kind of thinking is "executive control." Those that are consistently good at learning use metacognitive strategies whenever they study. On the other hand, kids may not always use the best strategy for learning. Every learner can benefit from using the following metacognitive strategies:

- **Knowing Your Limits:** Knowing one's own memory and cognitive limitations in regard to a certain activity is crucial. To begin, keep an eye out for situations when you may use some extra help or resources. Memory aids can be better managed and supported with the use of tools such as notes, reminders, or mnemonic devices. Thanks to this outside assistance, crucial details will not be forgotten and may be retrieved with relative ease.
- **Self-Monitoring:** Self-monitoring entails checking in with yourself on a frequent basis to see how well your learning strategies are working. For instance, you may use tools like concept maps to visually organize your knowledge. You can try teaching the material to someone else or making a personal summary of the information if you find that this approach isn't working. The key is to track how well your strategies are working and adjust accordingly.
- **Modify:** The key to success with this method is being honest with yourself about your current level of understanding and then working to improve. You may either read the material again, seek out more resources, or talk to a fellow student or instructor about it if you still don't get it after reading it. Attempting to fill up any gaps in your knowledge is ensured by shifting your method.
- **Skimming:** The goal of skimming is to quickly extract the most important points from a piece of text without wasting time on irrelevant elements. If you have a lot of data to manage, this is the way to go. By carefully observing the subheadings and summaries, you may efficiently obtain the information you want while avoiding unnecessary details. You can save time and keep the most important information at the top.
- **Rehearsing:** The goal of rehearsing is to improve competence and memory via repeated practice of an action or piece of information. Practice problems, essential information, or drills are all examples of what may fall into this category. Memory and the capacity to recall knowledge precisely when required are both bolstered by rehearsal.
- **Self-Test:** If you want to know how much you've learned, self-evaluation is the way to go. Regular self-tests on the subject can help you identify your strong points and where you might need some work. Some examples of this strategy include reviewing the material with a friend or family member, creating a flashcard set, or taking a mock exam. Doing regular self-evaluations is a great way to solidify what you've learnt and gain self-assurance in your abilities.

These metacognitive strategies are crucial for successful learning and academic achievement. They encourage introspection, engagement with the material, and the ability to adapt and improve one's own learning strategies. (Jaleel & P., 2016).

### **Metacognitive Awareness in Secondary School Students**

The effects of aging on metacognitive abilities become most apparent throughout the teen and middle school years. As they go through this stage, students typically demonstrate improved abilities in areas such as self-reflection, abstract reasoning, and strategic planning(Weil et al., 2013).There is strong evidence that metacognitive abilities mature with age, with the most notable growth happening between the ages of 12 and 15(Schneider, 2008).The development of the prefrontal cortex, an area vital to executive functions and metacognitive processes, is commonly thought to be the cause of this expansion.

The level of metacognitive awareness among secondary school pupils might vary greatly from one kid to the next. Cognitive capacity, background information, learning experiences, and intrinsic desire are all potential sources of these differences(Veenman et al., 2006).When it comes to reflecting on and controlling one's own learning processes, some pupils may be more naturally gifted than others.

Adolescents' metacognitive development is impacted by several variables. There is a strong impact of environmental factors, such as pedagogical approaches and family involvement. Prompt guidance in practicing metacognitive methods and receiving explicit training in these areas helps speed up the learning process(Dignath & Büttner, 2008).Furthermore, students might increase their metacognitive awareness through social interactions, especially conversations and partnerships between peers.

Metacognitive development is influenced by cognitive variables including processing speed and working memory capacity. It may be less of a challenge for students with superior cognitive talents to participate in metacognitive processes concurrent with their main task performance. Additional motivating elements that impact the acquisition and utilization of metacognitive abilities include self-efficacy and goal orientation. Metacognitive awareness is more prevalent among students who have faith in their own learning abilities and who are driven by the desire to achieve mastery(Coutinho, 2008).

In order to assist their students in developing metacognitive awareness, secondary school instructors should familiarize themselves with these changes that occur with age, as well as individual differences and the factors that impact them.

### **1.2 Literature review**

(Bakkaloglu, 2020)Metacognition is an essential skill that learners of any age must acquire. Thus, this scenario highlights all the critical aspects to think about while instructing kids in metacognitive habits and abilities in the classroom, irrespective of their grade level. The overarching purpose of this study is to examine how metacognitive awareness varies between elementary and secondary school pupils in relation to gender, grade level, and geographic region. This study used a survey to find out how much students in elementary and secondary schools knew about metacognition. Third, fourth, and fifth graders (195 girls and 204 boys) were among the 399 students who took the Metacognitive Awareness Scale. Metacognitive awareness rates were similar for male and female elementary and secondary school pupils, according to the study. A separate study found that pupils' degrees of metacognitive awareness varied between primary and high school. The students' metacognitive awareness was higher than that of their metropolitan peers. When looking at metacognitive awareness results by grade, fifth graders did the best. Having said that, there is little to no difference between the third and fourth graders' assessments of metacognitive awareness. This area of education can benefit from similar research projects that track the development of students' metacognitive awareness.

(Rajesh E.B., 2021)This study compared secondary school students' Meta-Cognition by gender, administrative style, and media of instruction. The descriptive survey method was used to interpret several numerical data kinds from the above subjects. A stratified random sampling approach chose 180 pupils from six Bengaluru District secondary schools. In addition to demographic data, Punitha Govil's 2003 Meta-Cognition Inventory was used. Half of the inventory's thirty items are "knowledge of cognition" and "management of cognition". The Independent 't' test was used to evaluate all data with a 0.05 significance criterion. The "t" test indicated that sex, management style, and teaching medium impact meta-cognition characteristics. Girls have better metacognition than guys in high school. Explaining the importance of metacognition in learning, especially for male students, and creating a metacognitive learning environment are vital for instructors. Public secondary schools have lower levels of student metacognition compared to private, unfunded institutions. Public and private schools must use metacognitive pedagogy. Secondary Kannada students have higher metacognition than English-speaking students. ESL teachers can build a metacognitive atmosphere by modeling and observing students' thinking. Students will

become more self-aware of their thoughts.

**(Talekar & Fernandes, 2016)** Effective learning relies heavily on metacognition. Recognizing when and how to employ specific learning and problem-solving techniques is one of its components. This course covers not just the subject matter but also how to teach it. Promoting pupils' metacognitive awareness should be a classroom goal. The study's author set out to evaluate secondary school students' metacognitive awareness as part of her dissertation research in Mumbai. The data was provided by 120 pupils from Mumbai's SSC Board Secondary School. Students' metacognitive awareness was determined to be ordinary, according to the poll. Additionally, there was no statistically significant difference between the sexes in terms of metacognitive awareness among Mumbai secondary school students.

**(Verma & Gupta, 2022)** Metacognitive talents are quickly becoming the new standard for senior secondary school curricula. The senior class of Ghaziabad District High School had their metacognitive abilities tested in this research. The sample size was 240 secondary school students, which is statistically significant for the population as a whole. To choose a cross-section of high school seniors for the study, researchers used the purposive sampling method. Specifically, a survey research strategy was used in this study. The researcher solely relied on Punita Govil's Metacognition Inventory (MCI) for this inquiry. The investigator used t-tests, means, and standard deviations to evaluate and interpret the data. In their senior year of high school, male and female students did not differ significantly in their metacognitive abilities, according to the study. Secondary school pupils in rural and urban locations, as well as those pursuing science and the arts, differ significantly in their metacognitive abilities, according to the study.

**(Schneider et al., 2017)** Early research in the 1970s found that metacognitive knowledge—that is, understanding the mental processes at work—influenced cognitive development. Early study focused on preschool and elementary school children's memory building. Despite metacognition research's evolution, measurement, organization, and development of metacognitive knowledge remain problematic: (1) What determines metacognitive competence? (2) How does secondary school metacognitive knowledge evolve? (3) Does metacognition knowledge apply outside domains? (4) Do metacognitive knowledge and success grow similarly? In our ongoing study on knowledge component creation, various research problems were addressed. The 928 German pupils in our database were tested on six subjects from fifth to ninth grade. The longitudinal research assessed metacognitive knowledge, arithmetic achievement, reading comprehension, and English as a foreign language, as well as their changes over time. After a brief historical review, this chapter offers the key findings on these four research areas. The most recent evaluation results are prioritized.

**(Jayaprabha & Kanmani, 2013)** Metacognition refers to the awareness of and control over one's own mental processes. The goal of this research is to find out whether and how scientific students' metacognitive awareness changes as they participate in inquiry-based and cooperative learning. A control group, two treatment groups (inquiry-based learning and cooperative learning), and a third group made up the quasi-experimental design. Three groups were given the same metacognitive awareness test, developed in 1994 by Schraw and Dennison. Students' levels of metacognitive awareness were higher in the cooperative learning group compared to the other groups. The study's authors suggest that teachers regularly use cooperative learning activities to raise their students' metacognitive awareness in high school.

**(Kalemkus & Bulut-Ozek, 2024)** This study aims to investigate how students' metacognitive awareness is affected by online project-based learning. As part of the study, thirty-three sixth graders participated. The research followed a mixed-methods strategy grounded in the action research paradigm. Quantitative data from both the pre- and post-tests were evaluated using the Paired-Samples T test in SPSS 22.0. Ten participants were interviewed using semi-structured interviews for the study. Then, the qualitative data was analyzed using the Nvivo program. Researchers found that students' metacognitive awareness increased when they participated in online project-based learning. The topics of task and metacognitive awareness, supervision, self-awareness, and monitoring were developed based on the study's qualitative findings. The code for self-assessment of learning and the code for evaluation of learning had the most frequency in the personal awareness category, while the code for reducing time wastage had the highest frequency in the task category and the monitoring category, respectively. Both the quantitative and qualitative outcomes of the study were determined to be valid.

**(Akaydin et al., 2020)** This study examines third- and fourth-graders' metacognitive awareness and decision-making ability. The relational survey method was used for this investigation. The study participants are third- and

fourth-grade Mugla, Marmaris public school kids. The 143-student sample was randomly selected. "The Teacher Form to Determine Primary School Students' Metacognitive Awareness" & "The Scale of Third and Fourth Grade Primary School Students' Perception of Decision-Making Skill" were used to gather data. The findings show elementary school kids have excellent metacognitive awareness and self-confidence. Gender and grade did not affect third and fourth graders' self-perceptions of decision-making and metacognition. They also found a weak but favorable association between students' metacognitive awareness and their assessments of their decision-making abilities. Elementary school teachers who foster metacognitive awareness may help kids make better decisions.

### **1.3 Research Methodology**

Data collecting and analysis, along with the study's methodology, measurements, and ethical considerations, are covered in this part. Research has a scholarly connotation in the academic community. Researchers claim that the research process includes problem formulation and definition, hypothesis generation on possible solutions, data collection, conclusion drawing, and hypothesis testing.

### **Research Design**

The study design determines the best suitable methodology for accomplishing specific research objectives within defined parameters. By utilizing the initial study objectives, it is feasible to develop a systematic plan for collecting and analyzing data. This article employs a descriptive research methodology to examine the Metacognitive Awareness of Secondary School Students. Descriptive research can be carried out using several methods, such as qualitative and quantitative methodologies. This inquiry employed both quantitative and qualitative methodologies. It employs an integrative approach. Defining the extent and boundaries of the study, along with collecting and examining data from participants, are crucial tasks in the research process. This research investigates the Metacognitive Awareness of Secondary School Students.

### **1.4 Methods and Tools used**

We used a poll to get the data. In order to learn more about secondary school students' metacognitive awareness, surveys are often used in different ways. Each study uses a representative sample to examine secondary school students' metacognitive awareness. The Metacognitive Awareness of Secondary School Students was evaluated using a checklist. This case's respondents were 120 students from various schools who filled out a survey.

### **1.5 Data Analysis**

The data in this study were analyzed utilizing the statistical software SPSS 22.0. We employed statistical procedures, including analysis of variance and percent-based techniques, to further investigate the data that we deemed to be of utmost importance. The inquiry emphasized the most essential components through the use of percentage analysis. Percentages are a useful tool for comparing and assessing different data sets. Utilizing this strategy to reach your target audience is straightforward. Once a sufficient amount of information is collected, a comprehensive depiction of the situation can be formulated. Graphs provide a more effective means of representing and interpreting percentage analysis.

### **1.6 Objective of the study**

- To find out the metacognitive awareness of secondary school students.
- To find out whether there exists any significant difference in the metacognitive awareness of secondary school students based on their locality.
- To find out whether there exists any significant difference in the metacognitive awareness of secondary school students based on their gender.
- To find out whether there exists any significant difference in the metacognitive awareness of secondary school students based on the type of school.

### **1.7 Result**

In-depth analysis of the interpretation of the survey data. The graph aids in a thorough examination of the data found in the table of frequencies and percentages. Analyses statistically were performed using T test.

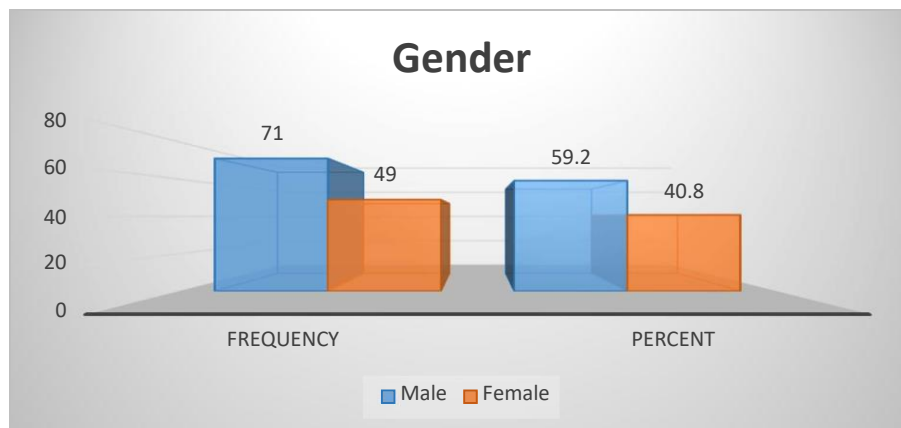
**Table 1.1: Gender wise distribution of respondents**

Gender		
	Frequency	Percent
Male	71	59.2
Female	49	40.8
Total	120	100.0

The above table discusses gender wise distribution of respondents. There are 71 males and 49 females are participated in this study whose percentages are 59.2% and 40.8% respectively.

**Graph 1.1: Graphical representation of gender wise distribution of respondents**

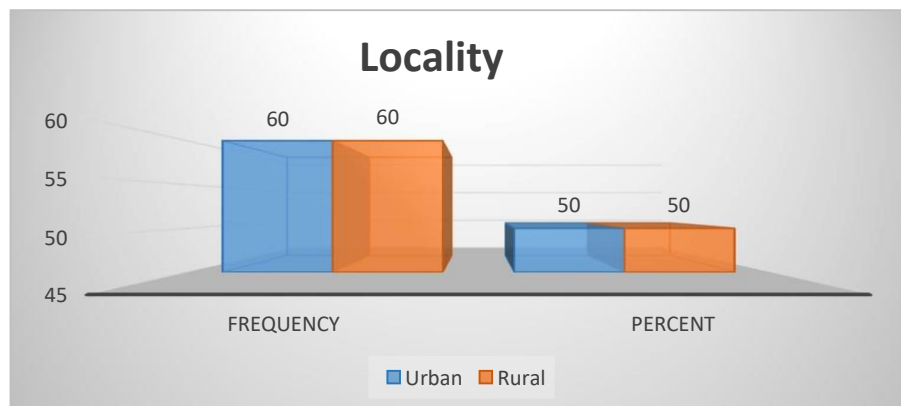
**Table 1.2: Locality wise distribution of respondents**



Locality		
	Frequency	Percent
Urban	60	50
Rural	60	50
Total	120	100

The above table discusses locality wise distribution of respondents. There are 60 urban and 60 rural students are included in this study.

**Graph 1.2: Graphical representation of locality wise distribution of respondents**



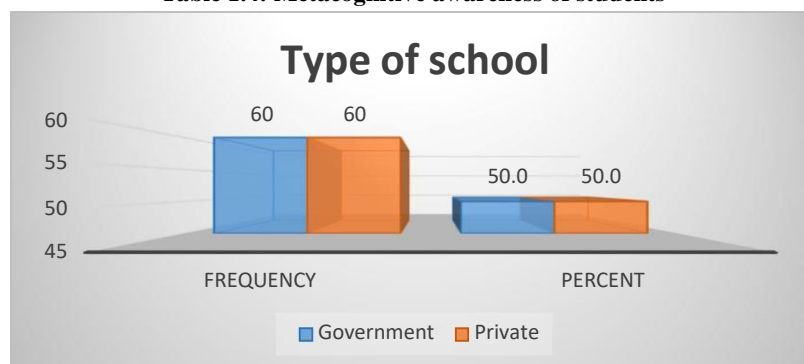
**Table 1.3: School wise distribution of respondents**

Type of school		
	Frequency	Percent
Government	60	50.0
Private	60	50.0
Total	120	100.0

The above table discusses school wise distribution of respondents. There are 60 government and 60 private school students are included in this study.

**Graph 1.3: Graphical representation of school wise distribution of respondents**

**Table 1.4: Metacognitive awareness of students**

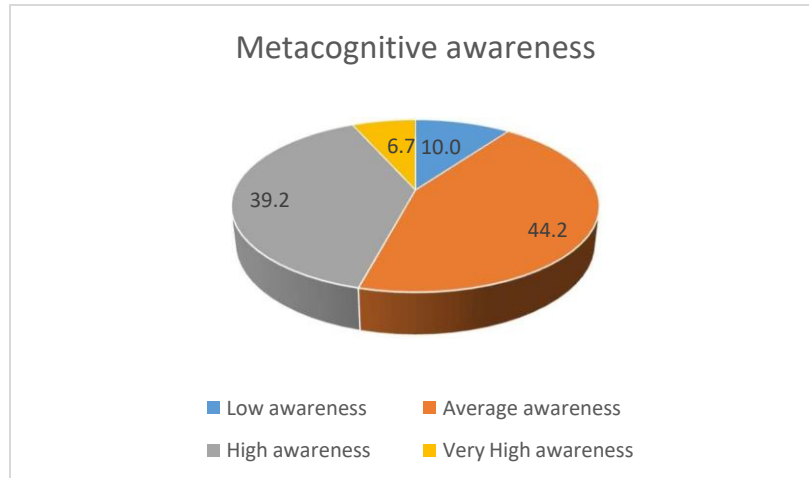


Metacognitive awareness		
	Frequency	Percent
Low awareness	12	10.0
Average awareness	53	44.2
High awareness	47	39.2
Very High awareness	8	6.7
Total	120	100.0

Percentile ratings for metacognitive awareness were utilized by the researchers to divide the study's total sample into four groups: low, average, high, and very high. The percentiles for P20, P40, P60, and P80 were determined, and students whose scores were within those ranges were categorized as Low (20 to 40%), Average (40 to 60%), High (60 to 80%), and Very High (above 80%), respectively. In our study, 12 (10%) students showed low awareness, 53 (44.2%) students showed average awareness, 47 (39.2%) students showed high awareness, 8 (6.7%) students showed very high awareness.

**Graph 1.4: Graphical representation of Metacognitive awareness of students**

**Table 1.5: Difference in the metacognitive awareness of secondary school students based on their locality**



Group Statistics					
	Locality	N	Mean	Std. Deviation	Std. Error Mean
Metacognitive	Urban	60	92.5000	23.48566	3.03199
	Rural	60	83.8167	17.89848	2.31068

Independent Samples Test								
		Levene's Test for Equality of Variances		t-test for Equality of Means				
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference
Metacognitive	Equal variances assumed	11.934	.001	2.278	118	.025	8.68333	3.81211
	Equal variances not assumed			2.278	110.247	.025	8.68333	3.81211

The mean metacognitive awareness score was significantly higher among students residing in urban areas (92.50) as compared to those living in rural areas (83.82). These findings suggest that, on average, students attending urban schools demonstrated higher levels of metacognitive awareness compared to students in rural schools. The independent samples t-test was used due to the presence of unequal variances. The findings indicated a statistically significant disparity ( $t = 2.278$ ,  $df = 110.247$ ,  $p = .025$ ) in metacognitive awareness between the two groups. There is a statistically significant difference in metacognitive awareness between urban and rural secondary school students, students in urban areas exhibiting higher average metacognitive awareness.

**Table 1.6: Difference in the metacognitive awareness of secondary school students based on their gender**

Group Statistics					
	Gender	N	Mean	Std. Deviation	Std. Error Mean

Metacognitive	Male	71	93.1831	23.31420	2.76689
	Female	49	80.8776	15.32105	2.18872

Independent Samples Test								
		Levene's Test for Equality of Variances		t-test for Equality of Means				
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference
Metacognitive	Equal variances assumed	10.867	.001	3.241	118	.002	12.30555	3.79678
	Equal variances not assumed			3.488	117.766	.001	12.30555	3.52791

The mean metacognitive awareness score for male students (93.1831) is greater than that for female students (80.8776). The average difference is 12.30555, suggesting that male students generally show greater metacognitive awareness compared to female students. The p-values (Sig. (2-tailed)) for equal variances assumed and not assumed are .002 and .001 respectively. Both p-values are below the significance level of .05, indicating that there is significant difference in metacognitive awareness between male and female students.

**Table 1.7: Difference in the metacognitive awareness of secondary school students based on their school type**

Group Statistics					
	Type of school	N	Mean	Std. Deviation	Std. Error Mean
Metacognitive	Government	60	78.2500	17.03598	2.19934
	Private	60	98.0667	20.50289	2.64691

Independent Samples Test								
		Levene's Test for Equality of Variances		t-test for Equality of Means				
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference
Metacognitive	Equal variances assumed	2.063	.154	-5.758	118	.000	-19.81667	3.44140
	Equal variances not assumed			-5.758	114.170	.000	-19.81667	3.44140

The mean metacognitive awareness score for private school students (98.0667) is greater than that for government school students (78.2500). The average difference is -19.81667, suggesting that private school students generally show greater metacognitive awareness compared to government school students. The p-values (Sig. (2-tailed)) for equal variances assumed and not assumed are .000 and .000 respectively. Both p-values are below the significance level of .05, indicating that there is significant difference in metacognitive awareness between private and

government school students.

### 1.8 Discussion

The study demonstrates that students in secondary schools exhibit different levels of metacognitive awareness. While a substantial proportion (44.2%) exhibited ordinary awareness, a large amount (39.2%) had excellent awareness. The distribution indicates that a significant number of students have acquired a certain level of metacognitive skills. However, there is still potential for enhancement, particularly among those classified in the low awareness category (10%). There was a notable disparity in metacognitive awareness between students residing in urban and rural areas. The average score of urban students was higher (mean = 92.50) compared to the average score of rural students (mean = 83.82). This discrepancy can be ascribed to variables such as disparities in resource accessibility, variations in exposure to varied educational contexts, or disparities in instructional methodologies between urban and rural schools. In contrast to prior studies, this research discovered a notable disparity in metacognitive awareness between male and female students. Male students exhibited significantly greater awareness (mean = 93.1831) in comparison to female students (mean = 80.8776). This discovery necessitates additional research into the reasons that contribute to the disparity in metacognitive abilities between genders. The school's classification as either private or government had a significant influence on the pupils' level of metacognitive awareness. Private school students demonstrated a considerably greater level of awareness (mean = 98.0667) in comparison to government school pupils (mean = 78.2500). The significant disparity prompts inquiries on the discrepancies in instructional approaches, educational materials, and academic settings between these two educational institutions.

### 1.9 Conclusion

The study reveals significant differences in metacognitive awareness across secondary school students, with a considerable portion exhibiting different degrees of awareness. Although a significant portion of individuals demonstrate a high level of awareness, there is still a large fraction that falls into the category of having poor awareness. There are noticeable differences in metacognitive abilities among various demographic groups, such as urban versus rural pupils, male versus female students, and students from private versus government institutions. These variations may arise from discrepancies in the availability of resources, the educational environments, the teaching methods used, and the organizational structures.

### 1.10 Recommendations

- Incorporate targeted interventions to improve metacognitive abilities in pupils with lower levels of awareness. This may entail the incorporation of metacognitive strategies into standard classroom procedures and the provision of specialized training for educators.
- Formulate policies that address the disparity in educational resources and opportunities between rural and urban institutions. This could involve the enhancement of teacher training in metacognitive teaching strategies, the provision of access to educational technology, and the improvement of infrastructure.
- Conduct additional research to ascertain the fundamental causes of the observed gender disparities in metacognitive awareness. Strategies may involve advocating for equitable teaching practices that accommodate a variety of learning styles and requirements.
- Improve the quality of education in government schools by addressing the discrepancies in academic environments, educational materials, and instructional approaches that exist in comparison to private schools. This may necessitate professional development for educators, resource allocation, and policy reforms.

### 1.11 References

- Akaydin, B. B., Yorulmaz, A., & Çokçalışkan, H. (2020). Investigation of Primary School Students' Metacognitive Awareness and Decision-Making Skill. *International Journal of Progressive Education*, 16(4), 157–171. <https://doi.org/10.29329/ijpe.2020.268.10>
- Bakkaloglu, S. (2020). Analysis of Metacognitive Awareness of Primary and Secondary School Students in Terms of Some Variables. *Journal of Education and Learning*, 9(1), 156. <https://doi.org/10.5539/jel.v9n1p156>
- Coutinho, S. (2008). Self-efficacy, metacognition, & performance. *North American Journal of Psychology*, 10(1), 165–172.

- DHYANI, R., & MAIKHURI, R. (2018). A study on the Metacognitive Awareness of Primary School Students. *International Journal of Research in All Subjects in Multi Languages*, 6(2), 56–61.
- Dignath, C., & Büttner, G. (2008). Components of fostering self-regulated learning among students. A meta-analysis on intervention studies at primary and secondary school level. *Metacognition and Learning*, 3(3), 231–264. <https://doi.org/10.1007/s11409-008-9029-x>
- E.B., R. (2021). A Study on Meta-Cognition of Secondary School Students in relation to Few Variables. *International Journal for Research Trends and Innovation*, 6(10), 127–132.
- Jaleel, S., & P., P. (2016). A Study on the Metacognitive Awareness of Secondary School Students. *Universal Journal of Educational Research*, 4(1), 165–172. <https://doi.org/10.13189/ujer.2016.040121>
- JAYAPRABA, G., & KANMANI, M. (2013). METACOGNITIVE AWARENESS IN SCIENCE CLASSROOM OF HIGHER SECONDARY STUDENTS. *International Journal on New Trends in Education and Their Implications*, 4(3), 49–56.
- Kalemkuş, F., & Bulut-Özek, M. (2024). The effect of online project-based learning on metacognitive awareness of middle school students. *Interactive Learning Environments*, 32(4), 1533–1551. <https://doi.org/10.1080/10494820.2022.2121733>
- Schneider, W. (2008). The Development of Metacognitive Knowledge in Children and Adolescents: Major Trends and Implications for Education. *Mind, Brain, and Education*, 2(3), 114–121. <https://doi.org/10.1111/j.1751-228X.2008.00041.x>
- Schneider, W., Lingel, K., Artelt, C., & Neuenhaus, N. (2017). *Metacognitive Knowledge in Secondary School Students: Assessment, Structure, and Developmental Change* (pp. 285–302). [https://doi.org/10.1007/978-3-319-50030-0\\_17](https://doi.org/10.1007/978-3-319-50030-0_17)
- Talekar, P. S., & Fernandes, A. (2016). A Study of Metacognitive Awareness Among Secondary School Students in Mumbai. *PARIPEX - INDIAN JOURNAL OF RESEARCH*, 5(5), 54–55.
- VAIJAYANTHI, P. D. (2016). AWARENESS ON METACOGNITION AMONG THE HIGHER SECONDARY SCHOOL STUDENTS IN TRICHY DISTRICT. *International Journal of Scientific Research and Modern Education*.
- Veenman, M. V. J., Van Hout-Wolters, B. H. A. M., & Afflerbach, P. (2006). Metacognition and learning: conceptual and methodological considerations. *Metacognition and Learning*, 1(1), 3–14. <https://doi.org/10.1007/s11409-006-6893-0>
- Verma, R. K., & Gupta, S. (2022). A STUDY OF METACOGNITIVE ABILITIES AMONG SENIOR SECONDARY SCHOOL STUDENTS OF GHAZIABAD DISTRICT. *Journal of Emerging Technologies and Innovative Research*, 9(8), 896–900.
- Weil, L. G., Fleming, S. M., Dumontheil, I., Kilford, E. J., Weil, R. S., Rees, G., Dolan, R. J., & Blakemore, S.-J. (2013). The development of metacognitive ability in adolescence. *Consciousness and Cognition*, 22(1), 264–271. <https://doi.org/10.1016/j.concog.2013.01.004>