



Influence of Technology Usage and Metacognitive Awareness on Academic Achievement of Secondary School Students

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ABSTRACT

Metacognitive mindfulness was helpful when executed in learning exercises, particularly recorded as a hard copy ability. The perseverance of this study investigates students' metacognitive awareness while writing. The object of the current exploration is to concentrate on the impacts of metacognitive mindfulness and innovation use on scholarly accomplishment with various mental styles in the Field Reliance Freedom (FRI) aspect while learning math content. Here, the questionnaire data are collected from 500 secondary school students in the Tirupur district, the descriptive survey approach is performed for data collection. There have been a few investigations which centre around the metacognitive awareness (MA) of senior secondary school understudies. However, the impact of issues in MA has not been widely revealed. This exploration pointed toward recognizing the Mama between the worker and occupant understudies of the Tirupur district. Quantitative investigation was isolated into two social occasions (suburbanite and occupant understudies). This review figures out the degree of metacognitive awareness of optional school understudies, the degree of innovation use of optional school understudies, level of scholastic accomplishment of auxiliary school understudies, It also figures out the impact of innovation utilization and metacognitive mindfulness on the scholarly accomplishment of assistant school students. The proposed analysis is performed on SPSS, and the variables are technology usage, metacognitive awareness, and academic achievement for boys and girls, rural and urban area students. There is a significant influence of Technology usage and Metacognitive awareness on the academic achievement of auxiliary school understudies. Discoveries show that the platform advances massive contrasts in metacognitive capacity, scholarly self-viability, and learning accomplishment. Similarly, the data show that students with different technology usage and metacognitive awareness achieve equivalent learning outcomes.

Keywords: Metacognitive Awareness, Technology Usage, Academic Achievement, Secondary School Students, Descriptive Survey.

1. INTRODUCTION

Over the years, there has been a change in schooling, especially in the space of teaching and learning an unfamiliar language, from an educator-focused way to deal with a student-focused approach. Today, educators are primarily concerned with viewing learners as more autonomous beings, directing all their attention towards accessing the learner's intellect and mental abilities [Souhila., 2020]. The ability to think critically and take ownership of their learning is something that is required of students. The main goal at a high level of graduation is accomplishing learning objectives and results by applying acquired abilities to a variety of tasks, situations, and contexts [Krieglstein et al., 2022]. The students should be self-sufficient in making wise decisions on the identification, choice, and application of suitable learning methodologies. The cognitive process is engaged in

learning through various stages, including planning, understanding, analyzing, applying, and evaluating [Pradhan and Das., 2021]. Metacognition is the awareness of one's learning process and the capacity to comprehend, manage, control, and regulate these cognitive processes. Undoubtedly, the concepts of metacognition and metacognitive awareness are crucial to second/foreign language learning. The fact that "understanding the nature of metacognitive awareness and strategies of acquiring and managing this knowledge in L2 learners is of enormous importance in dealing in depth with self-determined and self-regulated language learning" [Hindun et al, 2020] [Saricoban and Kirmizi, 2020]. While it has been discovered that metacognition is a crucial aspect of academic achievement and can be explicitly taught to both instructors and students, it often goes unnoticed as a skill, and professors are frequently unaware of metacognitive processes. More research is required to better understand how educators view metacognition in both themselves and their pupils because teachers have minimal formal training and low competency in this area [McKendree and Washburn, 2021].

Samuel and Okonkwo [Samuel and Okonkwo, 2021] investigated how metacognition, locus of control, and scholastic accomplishment connected in optional school science understudies in the Nigerian province of Anambra. To boost academic accomplishment and locus of control, students should take advantage of the opportunity to learn metacognitive abilities and tactics, and professors should instruct their classes on the best metacognitive techniques. From first to fourth grade, primary school students grow in their metacognitive and vocabulary knowledge, as well as their understanding of the dynamic correlation between the two forms of information [Teng, 2021]. As a result of the study, it was discovered that participants' vocabulary and metacognitive skills did not advance cumulatively from first to fourth grade. Throughout the chosen school years, there was a huge connection between participants' level of metacognitive understanding and their vocabulary knowledge [Santangelo et al., 2021].

Quasi-experimental research is used to determine how the problem-posing method affects students' problem-solving abilities and metacognitive awareness in science education. Participants were given pre and post-tests that included surveys on metacognitive awareness and problem solving skills [Akben, 2020]. The skill to resolve complications and knowledge of one's thinking suggested the need for more research on this issue, in addition to the value of including problem-posing exercises within science education programs [Jafari et al., 2021]. Quantitative elements include questionnaires as the data collecting method, while qualitative elements use semi-structured interviews. An assessment is conducted on the correlation between the use of information and communication technology, self-regulated learning, and the academic achievement of aspiring teachers. [Onivehu et al., 2018].

Students at a South Tangerang private senior secondary school are the subjects of the review conducted by Warni et al. [Warni et al., 2018]. Learning English outside of the classroom has promoted the growth of pupil independence, and contains elements of motivation for learning, metacognitive awareness, self-assurance, and social skills. Virtual reality technologies have recently been developed for diversity utilization in education, but more study is required to establish acceptable and effective learning approaches and practices to inspire meaningful learning. In a constructivist paradigm, virtual reality expertise concentrates on students' actively participatory learning processes and aims to close the knowledge-to-experience gap. As a further determinant of perceived utility, learning desire is also significant. Following that, three crucial variables that influence learners' intention to utilize this education atmosphere are perceived usability and learning motivation [Joo et al., 2018] [Huang and Liaw, 2018]. The remaining work is trailed as section 2 reveals the literature survey of the work, section 3 portrays the research problem definition and motivation, and section 4 depicts the proposed research methodology [Manzoor and Ali, 2018]. Accordingly, section 5 illustrates the experimentation and result discussion part, and section 6 demonstrates the research conclusion [Manzoor and Hamid, 2023].

2. LITERATURE SURVEY

Cognitive guidelines connected with learning freedom are an issue that frequently shows up in remote learning. It is connected with metacognition awareness, which is said to assist understudies with understanding how to learn and control the growing experience to tackle another issue. Wafubwa and Csikos [Wafubwa and Csikos, 2022] investigated the effects of formative evaluation on the mathematics proficiency and metacognitive attention of auxiliary school understudies [Jan et al., 2023]. Following a mediation for developmental evaluation, the understudy's math accomplishment scores and their metacognitive mindfulness were looked at utilizing a semi-trial pretest-posttest non-identical gathering plan to check whether there was any noticeable distinction. After adapting to pretest scores, disclosures exposed that understudies who were shown utilizing a developmental evaluation educational procedure showed improvement over the people who were shown utilizing a traditional methodology regarding both science accomplishment and metacognitive awareness [Manzoor and Hamid, 2021].

Examination of scholars' metacognitive cognizance in writing was done by Krisdianata and Kuswandono [Krisdianata and Kuswandono, 2022]. Metacognitive awareness proved useful when used in educational tasks, particularly in writing abilities. Definitive information, procedural information, and restrictive information — all of which involved planning, monitoring, and evaluating—were combined to generate metacognitive knowledge. Data were gathered using questionnaires, which were then partially evaluated by expending

evocative enquiry and presented in tables. The findings indicated that producing descriptive texts required by high school students required little metacognitive understanding and management. Based on gender, fieldward, and field-free mental styles, Asy'ari and Da Rosa [Asy'ari and Da Rosa, 2022] examined the metacognitive awareness of prospective science teachers (PST) who took part in remote learning. The gathering implanted figure test instrument, which experimentally ended up being legitimate and solid, was utilized to distinguish PST mental style and to accumulate the PST metacognitive mindfulness. While PST metacognitive awareness differed significantly depending on cognitive style, it did not differ much depending on gender differences.

The effect of learning examination (LA) on understudies' metacognitive mindfulness and scholastic achievement in a web-based learning climate was studied by Karaoglan et al. [Karaoglan Yilmaz, 2019]. The quasi-experimental design employed a mixed techniques approach. To learn what the students thought of LA and the learning environment, a semi-structured student opinion survey was conducted. The qualitative research found that LA improved participants' academic performance and metacognitive awareness. By the findings, several recommendations for teachers, instructional designers, and researchers were made about the creation and administration of online learning environments. Metacognitive skills and low motivational dispositions are potential contributors to underachievement. With gifted and non-gifted kids from Germany in Grades 6 and 8, Tibken et al. [Tibken et al., 2022] evaluated the interaction of these variables continuously. The reading comprehension area encompassed evaluations of declarative and procedural metacognitive skills. Additionally, procedural metacognition served as a mediator between the effects of declarative metacognition and the need for cognition on academic attainment.

While enrolled in teacher education programs in Pakistan, Ashfaq et al. [Ashfaq et al., 2022] examined the association between future instructors' metacognitive awareness and their scholarly turn of events. The data for this study came from those enrolled in master's- and bachelor 's-level teacher education programs. A sample of 150 prospective instructors from two public colleges was selected using a straightforward random selection procedure. It has been demonstrated that potential teachers at the M.Ed. Level exhibits higher levels of metacognitive awareness than prospective teachers at the B.Ed. Additionally, it was demonstrated that there was a solid positive connection between scholar accomplishment and prospective teachers' understanding of their metacognition. The self-regulated learning hypothesis recognizes the significance of individual metacognitive checking and bunch level control for collaborative learning success. Nevertheless, very few research have looked empirically at how these elements interact. As a result, Haataja et al. [Haataja et al., 2022] looked into how group-level control, accuracy of personal metacognitive monitoring and metacognitive interactions within groups all contribute to the prediction of students' learning achievement. The outcomes showed how complex factors at the individual and group levels interact to influence the outcomes of learning in collaboration [Manzoor et al., 2021].

The Metacognition Awareness Inventory (MAI) validity was determined by Hassan et al. [Hassan et al., 2023] based on the statistical association between metacognitive skills such as knowledge of cognitive factors and regulation of cognitive factors. Utilizing the Pearson correlation coefficient, the scholarly exhibition close to the furthest limit of semester appraisal in both composed and clinical evaluations was contrasted with the MAI score. The goal of the cross-sectional survey study was to determine whether there is any connection between media and technology use and academic achievement. After adjusting for gender, age, and research year, Uzun and Kilis [Uzun and Kilis, 2019] investigated how multitasking and self-regulation affect this effect. Furthermore, despite adjusting for this specific socioeconomics, just media and innovation use significantly and adversely affected the prediction of students' academic achievement, although multitasking and self-control of behaviour did not. The effect of developmental input on understudies' metacognitive capacities while utilizing criticism techniques with surveying innovation was therefore explored by Molin et al. [Molin et al., 2019]. Understudies in the singular gathering just use educator criticism, while those in the helpful gathering utilize both instructor remarks and friend discussions. On the other hand, when given individualized care, young ladies altogether work on their metacognitive limits and are not entirely set in stone as young men.

3. RESEARCH PROBLEM DEFINITION AND MOTIVATION

Metacognition alludes to higher-request thinking which includes dynamic command over the mental cycles participated in learning. Exercises, for example, arranging how to move toward a given learning task, checking perception, and assessing progress toward the fulfilment of an errand are metacognitive. Since metacognition assumes a basic part in effective learning, it means quite a bit to concentrate on metacognitive movement and improvement to decide how understudies can be educated to more readily apply their mental assets through metacognitive control. When it comes to education and knowledge, metacognition is used in a lot of good ways. Moreover, the vital parts of understudy-focused training are among the review methods, where understudies utilize their metacognitive mindfulness, manage their review systems, and have inspiration. Metacognitive mindfulness is a significant supporter of outcomes in learning and addresses a brilliant device for the estimation of scholastic execution.

Numerous research has demonstrated the close relationship between metacognitive abilities and intrinsic drive. These examinations connected the progress of scholarly association of understudies to their natural

inspiration and utilization of sound and productive metacognition techniques, in contrast with their kindred understudies who have no characteristic thought processes. The sort of metacognition procedures and characteristic inspiration assume a significant part in the understudy's scholarly accomplishment. Besides, research presently can't seem to debilitate appropriate contemplations connected with innovation empowered performing multiple tasks. In addition, student-held metacognitive awareness and technology use have not been empirically examined in any known studies. Understudy innovation use is exceptionally connected with their uplifting outlooks towards innovation and also their tension without innovation and reliance on innovation. This inspires the examination to concentrate because of innovation use and metacognitive mindfulness on the scholastic accomplishment of understudies.

4. PROPOSED RESEARCH METHODOLOGY

Learning is an interaction created inside a solitary person throughout life. In any case, to find successful students, reflection, criticism and a consciousness of the information are fundamental. Metacognition is the consciousness of a person's mental processes. Metacognitive mindfulness assists a student with being independent and self-controlled. Advancing metacognition starts with building mindfulness among students that metacognition exists, contrasts from discernment and increments scholastic achievement. Consequently, the reason for this review is to investigate the impact of innovation use and metacognitive mindfulness on the scholarly accomplishment of Auxiliary School Understudies. The current review embraced an unmistakable overview approach. Given the idea of the issue, the examiner proposes to utilize the review strategy. For the current review, the example will be 500 Auxiliary School understudies in the Tirupur region.

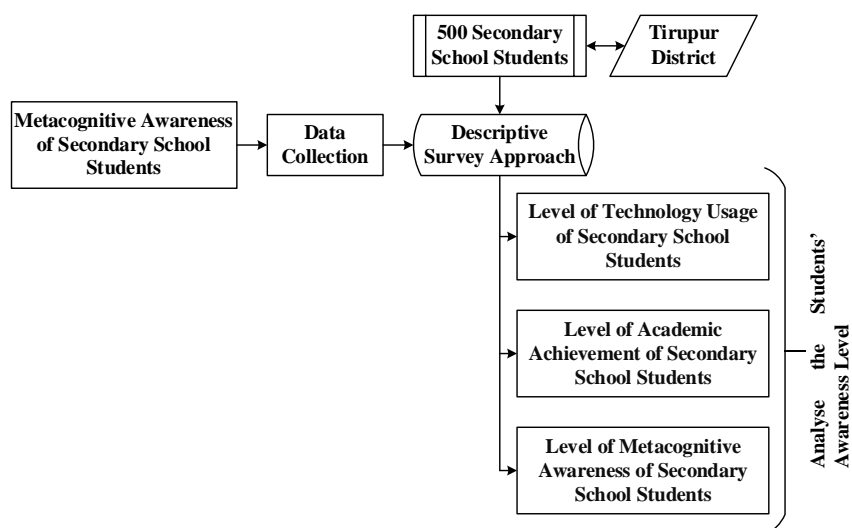


Figure 1: Proposed Work Flow Diagram

Figure 1 depicts the proposed work flow diagram. Here, metacognitive awareness is crucial to be introduced and acquired by learners as it can assist students in sustainable life-long learning.

4.1 Objective of the Study

All the participants were involved in the quantitative part of the research. The achievement scores of the students were also obtained from the school administrators. The generic objective of this research is as follows:

- To figure out the degree of metacognitive attention to auxiliary school understudies.
- To figure out the degree of innovation use of auxiliary school understudies.
- To figure out the degree of scholastic accomplishment of auxiliary school understudies.
- To determine how students' use of technology and metacognitive awareness affect their academic success in secondary school.

4.2 Hypothesis of the Study

Some of the assumptions made for the study are as follows:

Innovation Use of Optional School Understudies

- There is no massive contrast between young men's and young ladies' valuable school students in their degree of innovation utilization.
- There is no enormous qualification among national and metropolitan discretionary school students in their level of development usage.

Metacognitive Attention to Optional School Understudies

- There is not a substantial amount of contrast among young men's and young ladies' optional school understudies in their degree of Metacognitive Mindfulness.
- There is not a substantial amount of contrast between country and metropolitan auxiliary school understudies in their degree of Metacognitive Mindfulness.
- There is not a substantial amount of relationship between the financial situations with optional school understudies in their degree of Metacognitive Mindfulness.

Scholarly Accomplishment of Auxiliary School Understudies

- There is no gigantic difference between young fellows' and young women's assistant school students in their level of Scholastic accomplishment.
- There is no massive distinction between common and metropolitan discretionary school students in their level of Scholastic accomplishment.
- The financial circumstances of optional school students and their degree of academic achievement are not significantly linked.

Metacognitive Awareness, Technology Use, and Secondary School Students' Academic Achievement

- There is certainly not a significant measure of association between Development use and the instructive accomplishment of colleague school understudies.
- There is certainly not a significant measure of association between Metacognitive care and the instructive accomplishment of colleague school understudy's students.
- There is not a critical relationship between innovation use and metacognitive academic achievement among understudies in assistant schools.

Impact of Innovation Use and Metacognitive Mindfulness on Scholastic Accomplishment of Auxiliary School Understudies

- There is certainly not a significant measure of the effect of Development use and Metacognitive care on the educational achievement of discretionary school students.

Factor Investigation of Innovation Use and Metacognitive Mindfulness on Scholastic Accomplishment of Optional School Understudies

- There is not a significant measure of components with positive stacking of the elements specifically Development use and Metacognitive care, the educational achievement of discretionary school understudies.

4.3. Materials and Methods

A one-of-a-kind outline was acquainted with assembling data. To make deductions about a populace of optional school understudies in the Tirupur region, this study was done. The specialist had the option to get a superior comprehension of the components of metacognitive information and guidelines that senior secondary school understudies detailed by utilizing rates and quantities of the discoveries. In this review, the survey information gathered and afterwards examined utilizing the SPSS program to track down the component of metacognitive information and guidelines. The members were picked utilizing an irregular examining strategy. The populace was focused on the entire class. In this review, a sum of 500 examples of information is gathered from school understudies of the Tirupur district

Participants were instructed to compose essays based on the assigned topic. According to Gunstone, giving a proper task in writing before conducting metacognitive research was important to connect metacognitive knowledge to real activity. After they finished the writing activity, they had time to fill out the provided questionnaire. The aftereffect of the survey was inspected utilizing the SPSS program to know the rates of the component of metacognitive information and guidelines. The data collected from the questionnaire were analyzed using descriptive statistics to find the percentages and SD using the SPSS program. The result was presented in the form of a table. The result showed the metacognition of knowledge and regulation applied as reported by the participants.

Research Design

For this study, experimental research was modified; in other words, subjects were randomly assigned to the workgroups. The study's independent variable is the e-learning environment with two values: one group that interacted with an e-learning environment containing metacognitive scaffolding and another group that interacted with an e-learning environment without scaffolding. The review has a related variable named cognitive style in the FDI aspect, with three qualities: field wards, intermediates (INT), and independents. In this sense, the design for the analysis of the outcomes fit into a 2 x 3 factorial design. Metacognitive ability, academic self-efficacy, and learning achievement were the dependent variables. The review uses 500 optional

The Descriptive Statistics for Technology Usage are presented in Table 2. Descriptive statistics, as the name implies, highlight a certain aspect of the data they summarize. These insights fall into two general classes: the proportions of focal inclination and the proportions of spread. The Descriptive Statistics are measured for technology usage between boys and girls, and rural and urban area students. The Descriptive Statistics are 5.919 for BTU, 5.882 for GTU, 5.819 for RTU, and 5.991 for UTU.

Table 3: Descriptive Statistics for Metacognitive Awareness

Descriptive Statistics									
	N	Minimum	Maximum	Mean	Std. Deviation	Skewness		Kurtosis	
	Statistics	Statistics	Statistics	Statistics	Statistics	Statistics	Std. Error	Statistics	Std. Error
BMA	500	6	30	19.17	6.011	.107	.109	-1.234	.218
GMA	500	7	30	19.22	6.027	.135	.109	-1.220	.218
RMA	500	6	30	18.62	5.965	.261	.109	-1.146	.218
UMA	500	0	31	19.06	5.953	.056	.109	-1.029	.218
Valid N (listwise)	500								

There are three significant sorts of distinct insights: Proportions of recurrence (recurrence, per cent), proportions of focal propensity (mean, middle and mode), and proportions of scattering or variety (fluctuation, SD, standard mistake, quartile, interquartile range, percentile, reach, and coefficient of variety give straightforward synopses about the example and the actions. A proportion of recurrence is generally utilized for unmitigated information while others are utilized for quantitative information. Table 3 depicts the unmistakable insights of Metacognitive Familiarity with boys and girls, provincial region understudies and metropolitan region understudies. The standard deviation for BMA, GMA, RMA, and UMA are 6.011, 6.027, 5.965, and 5.953, respectively.

Table 4: Descriptive Statistics for Academic Achievement

Descriptive Statistics									
	N	Minimum	Maximum	Mean	Std. Deviation	Skewness		Kurtosis	
	Statistics	Statistics	Statistics	Statistics	Statistics	Statistics	Std. Error	Statistics	Std. Error
BAA	500	0	32	19.87	6.115	-.125	.109	-1.121	.218
GAA	500	0	46	19.26	5.879	.203	.109	-.289	.218
RAA	500	7	31	19.22	6.162	.199	.109	-1.270	.218
UAA	500	8	31	19.27	5.980	.128	.109	-1.306	.218
Valid N (listwise)	500								

Table 4 portrays the descriptive statistics for academic achievement for pupils, rural and urban area students. The variable is young men and young ladies in their AA, rustic and metropolitan region understudies in their AA. Vivid data of this study are 6.115 for BAA, 5.879 for GAA, 6.162 for RAA, and 19.27 for UAA, respectively.

Multiple Correlation

The different relationship coefficient is a proportion of affiliation connected to various relapses and is useful as a preliminary assessment tool to determine the characteristics of a relapse model. For this situation, it is determined as the Pearson relationship between evaluations and genuine qualities.

Table 5: Multiple Correlation of this Study

ANOVA ^a						
Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	1115.718	11	101.429	2.822	.001 ^b
	Residual	17540.832	488	35.944		
	Total	18656.550	499			
a. Dependent Variable: BAA						
b. Predictors: (Constant), UAA, RMA, BMA, GAA, GTU, UMA, RAA, BTU, GMA, UTU, RTU						

Table 5 shows the ANOVA investigation has a genuinely huge distinction between our gathering implies. The importance esteem is 0.001 (i.e., $p = 0.001$), which is underneath 0.05, and there is a genuinely huge contrast in the mean period to finish the calculation sheet issue between the various courses taken. This is perfect to be aware of, however don't know which of the particular gatherings contrasted.

Product Moment Correlation Analysis

The Pearson product second correlation coefficient, denoted by r , quantifies the degree of a linear link between two variables. A Pearson thing second connection endeavours to show a best-fit constraint using the data from two parts, and the Pearson connection coefficient, r , shows the distance away this gigantic number of server ranches are to this mark of finest fitting (i.e., how well the server ranches fit this new model/line of best fit).

Table 6: Boys and Girls Correlation Analysis in Technology Usage

Correlations			
		BTU	GTU
BTU	Pearson Correlation	1	.174**
	Sig. (2-tailed)		.000
	N	500	500
GTU	Pearson Correlation	.174**	1
	Sig. (2-tailed)	.000	
	N	500	500
**. Correlation is huge at 0.01 level (2-followed).			

The Pearson relationship coefficient examination of young men and young ladies in innovation utilization is introduced in Table 6. The Pearson relationship coefficient esteem is 0.174. It shows a positive connection among boys' and girls' optional school understudies in their level of advancement use.

Table 7: Boys and Girls Correlation in Metacognitive Awareness

Correlations			
		BMA	GMA
BMA	Pearson Correlation	1	.136**
	Sig. (2-tailed)		.002
	N	500	500
GMA	Pearson Correlation	.136**	1
	Sig. (2-tailed)	.002	
	N	500	500
**. Correlation is huge at 0.01 level (2-followed).			

Table 7 uncovers the Pearson connection coefficient results for young men and young ladies regarding Metacognitive Mindfulness. The Pearson connection coefficient is 0.136 for this situation, showing a huge relationship in the degree of Metacognitive Mindfulness among young men's and young ladies' optional school understudies.

Table 8: Boys and Girls Correlation in Academic Achievement

Correlations			
		BAA	GAA
BAA	Pearson Correlation	1	.118**
	Sig. (2-tailed)		.008
	N	500	500
GAA	Pearson Correlation	.118**	1

	Sig. (2-tailed)	.008	
	N	500	500
**. Correlation is huge at the 0.01 level (2-followed).			

Table 8 outlines the Pearson relationship coefficient results for young men and young ladies concerning Scholastic Accomplishment. Here, the Pearson connection coefficient is 0.118, which describes an optimistic connection between young men's and young ladies' discretionary school understudies in their degree of Scholarly Accomplishment.

Table 9: Rural and Urban Secondary School Students' Correlation in Technology Usage

Correlations			
		RTU	UTU
RTU	Pearson Correlation	1	.134**
	Sig. (2-tailed)		.003
	N	500	500
UTU	Pearson Correlation	.134**	1
	Sig. (2-tailed)	.003	
	N	500	500
**. Correlation is huge at the 0.01 level (2-followed).			

Table 9 decides the Pearson connection coefficient results for country and metropolitan region understudies regarding Innovation Use. Here, the Pearson relationship coefficient is 0.134, which describes an optimistic connection among national and metropolitan locale discretionary school students in their level of Educational Achievement.

Table 10: Rural and Urban Secondary School Students' Correlation in Metacognitive Awareness

Correlations			
		RMA	UMA
RMA	Pearson Correlation	1	.180**
	Sig. (2-tailed)		.000
	N	500	500
UMA	Pearson Correlation	.180**	1
	Sig. (2-tailed)	.000	
	N	500	500
**. Correlation is huge at the 0.01 level (2-followed).			

Table 10 displays the Metacognitive Awareness of rural and urban students' Pearson correlation coefficient analyses. The Pearson connection coefficient esteem is 0.180. It shows a positive connection between country and metropolitan optional school understudies in their degree of Metacognitive Mindfulness.

Table 11: Rural and Urban Secondary School Students' Correlation in Academic Achievement

Correlations			
		RAA	UAA
RAA	Pearson Correlation	1	.099*
	Sig. (2-tailed)		.027
	N	500	500
UAA	Pearson Correlation	.099*	1
	Sig. (2-tailed)	.027	
	N	500	500
*. Correlation at the 0.05 level, it's huge (2-followed).			

The Pearson connection coefficient examination of provincial and metropolitan region understudies in Scholarly Accomplishment is introduced in Table 11. The Pearson connection coefficient esteem is 0.027. It shows a basic association between common and metropolitan area students in their level of Scholastic Accomplishment.

T-Test

A precise test for determining the mean of two social affairs of elements is the T-test. It is typically applied when the data sets have subtle differences, are derived from a similar population, and follow an ordinary distribution.

Table 12: T-Test for Technology Usage

One-Sample Test						
	Test Value = 45					
	t	df	Sig. (2-tailed)	Mean Difference	95% Difference Confidence Interval	
					Lower	Upper
BTU	-97.440	499	.000	-25.794	-26.31	-25.27
GTU	-99.026	499	.000	-26.050	-26.57	-25.53

The one-model t-test is a person from the t-test family. Continuously circled data are the focus of every test in the t-test family, which looks at differences in mean scores across infinite levels (stretch or extent). As opposed to the free or subordinate example t-tests, the one-example t-test utilizes a solitary mean score. The one-model t-test looks at the particular mean manual for an ordained worth to finish up whether or not the model mean is essentially more basic unequivocally than value. From Table 12, the t-test results for Technology Usage are analysed. It consists of the t-test values as -97.440 and -99.026 for technology usage of boys and girls. However, the t-test results for rural and urban area students are -98.016 and -95.340 for technology usage.

Table 13: T-Test for Metacognitive Awareness

One-Sample Test						
	Test Value = 45					
	t	df	Sig. (2-tailed)	Mean Difference	95% Difference Confidence Interval	
					Lower	Upper
BMA	-96.109	499	.000	-25.834	-26.36	-25.31
GMA	-95.629	499	.000	-25.776	-26.31	-25.25

T-test results for Metacognitive Awareness are portrayed in Table 13. It consists of t-test values for Metacognitive Awareness for boy and girl students. However, Metacognitive Attention to Boy and Girl students' T-Test values are -96.109 and -95.629. However, the t-test results for rural and urban area students for Metacognitive Awareness are -98.901 and -97.454, respectively.

Table 14: T-Test for Academic Achievement

One-Sample Test						
	Test Value = 45					
	t	DF	Sig. (2-tailed)	Mean Difference	95% Difference Confidence Interval	
					Lower	Upper
BAA	-91.899	499	.000	-25.130	-25.67	-24.59
GAA	-97.916	499	.000	-25.744	-26.26	-25.23

The T-test results for Academic Achievement are portrayed in Table 14. It consists of t-test values for Academic Achievement for both boy and girl students. However, the Academic Achievement levels of boy and girl students' T-test values are -91.899 and -97.916. However, the t-test results for rural and urban area students for Academic Achievement are -93.566 and -96.233, respectively.

Chi-Square Test

Experts should utilize the Chi-Square Test, for a factual test, to decide an openly critical connection between two subjective factors.

Table 15: Chi-Square Test for Boys' and Girls' Academic Achievement

Chi-Square Tests			
	Value	DF	Asymptotic Significance (2-sided)
Pearson Chi-Square	848.403 ^a	625	.000
Likelihood Ratio	674.219	625	.084
Linear-by-Linear Association	6.961	1	.008
N of Valid Cases	500		
a. 676 cells (100.0%) have an expected count of fewer than 5. The least estimated tally is .00.			

The chi-square test for identifying connections between two unmitigated factors is a general test. Assuming the test is critical, it means a lot to take a gander at the information to become familiar with the idea of the

relationship. The chi-square test is a crude method that becomes increasingly precise as the sizes of the items in the table's cells increase. As such, it is imperative to verify that the counts are large enough to produce a reliable p-esteem (table 15). Fortuitously, the chi-square guess is exact for extremely unassuming counts. It produces a ratio of 0.084, which is under 5.

Table 16: MANOVA Test for Rural Technology Usage

Multivariate Tests ^a						
Effect		Value	F	Hypothesis df	Error df	Sig.
Intercept	Pillai's Trace	.839	1229.259 ^b	2.000	473.000	.000
	Wilks' Lambda	.161	1229.259 ^b	2.000	473.000	.000
	Hotelling's Trace	5.198	1229.259 ^b	2.000	473.000	.000
	Roy's Largest Root	5.198	1229.259 ^b	2.000	473.000	.000
RTU	Pillai's Trace	.154	1.582	50.000	948.000	.007
	Wilks' Lambda	.851	1.585 ^b	50.000	946.000	.007
	Hotelling's Trace	.168	1.587	50.000	944.000	.007
	Roy's Largest Root	.110	2.088 ^c	25.000	474.000	.002
a. Design: Intercept + RTU						
b. Exact statistic						
c. The measurement is a lower bound on the importance level derived from an upper constraint on F.						

A multivariate test in MANOVA looks at the connection between factors in Table 16. In this test, Wilk's Lambda regard figures out the power of the relationship. The number is consistently somewhere in the range of 0 and 1. The optimal amount is close to 0. Example shown in the table below, for the 1st variable WC, the value is 0.851 which is close to 1. The significance value is very high i.e., 0.839 > 0.05.

Table 17: MANOVA Test for Urban Technology Usage

Multivariate Tests ^a						
Effect		Value	F	Hypothesis df	Error df	Sig.
Intercept	Pillai's Trace	.828	1141.940 ^b	2.000	474.000	.000
	Wilks' Lambda	.172	1141.940 ^b	2.000	474.000	.000
	Hotelling's Trace	4.818	1141.940 ^b	2.000	474.000	.000
	Roy's Largest Root	4.818	1141.940 ^b	2.000	474.000	.000
UTU	Pillai's Trace	.119	1.257	48.000	950.000	.117
	Wilks' Lambda	.884	1.257 ^b	48.000	948.000	.116
	Hotelling's Trace	.128	1.258	48.000	946.000	.116
	Roy's Largest Root	.082	1.622 ^c	24.000	475.000	.033
a. Design: Intercept + UTU						
b. Exact statistic						
c. The estimation produces a lower constraint on the relevance level based on an upper bound on F.						

The MANOVA for Urban Technology Usage is presented in Table 17. In this test, Wilk's Lambda value explains the strength of the relationship. The value generally lies somewhere in the range of 0 and 1. The ideal value is near 0. For the 1st variable WC, the value is 0.884 which is close to 1. The significance value is very high i.e., 0.828 > 0.05.

Table 18: MANOVA Test for Metacognitive Awareness

Multivariate Tests ^a						
Effect		Value	F	Hypothesis df	Error df	Sig.
Intercept	Pillai's Trace	.841	1257.108 ^b	2.000	475.000	.000
	Wilks' Lambda	.159	1257.108 ^b	2.000	475.000	.000
	Hotelling's Trace	5.293	1257.108 ^b	2.000	475.000	.000
	Roy's Largest Root	5.293	1257.108 ^b	2.000	475.000	.000
RMA	Pillai's Trace	.141	1.567	46.000	952.000	.010

	Wilks' Lambda	.864	1.565 ^b	46.000	950.000	.010
	Hotelling's Trace	.152	1.562	46.000	948.000	.011
	Roy's Largest Root	.085	1.765 ^c	23.000	476.000	.016
a. Design: Intercept + RMA						
b. Exact statistic						
c. The estimation produces a lower constraint on the relevance level based on an upper bound on F.						

The MANOVA for Metacognitive Awareness is presented in Table 18. Wilk's Lambda value of this test is 0.864. This value always lies in-between 0 and 1. The ideal value is close to 1. For the 1st variable WC, the value is 0.159 which is near 0. The significance value is very high i.e., $0.841 > 0.05$.

Table 19: MANOVA Test for Academic Achievement

Multivariate Tests ^a						
Effect		Value	F	Hypothesis df	Error df	Sig.
Intercept	Pillai's Trace	.840	1243.873 ^b	2.000	475.000	.000
	Wilks' Lambda	.160	1243.873 ^b	2.000	475.000	.000
	Hotelling's Trace	5.237	1243.873 ^b	2.000	475.000	.000
	Roy's Largest Root	5.237	1243.873 ^b	2.000	475.000	.000
RAA	Pillai's Trace	.085	.917	46.000	952.000	.631
	Wilks' Lambda	.917	.917 ^b	46.000	950.000	.631
	Hotelling's Trace	.089	.917	46.000	948.000	.632
	Roy's Largest Root	.057	1.187 ^c	23.000	476.000	.251
a. Design: Intercept + RAA						
b. Exact statistic						
c. The estimation produces a lower constraint on the relevance level based on an upper bound on F.						

The MANOVA for Academic Achievement is presented in Table 19. Wilk's Lambda value of this test is 0.160. This value always lies between 0 and 1. The ideal worth is near 0. Therefore, for the variable RAA, the value is 0.917 which is close to 1. The significance value is very high i.e., $0.840 > 0.05$, respectively.

Implications and Limitations of the Study

The implications of the study on the Influence of Technology Usage and Metacognitive Awareness on Academic Achievement of Secondary School Students are significant. Firstly, it highlights the positive impact of metacognitive mindfulness on learning outcomes, particularly in written tasks, underscoring its crucial role in educational contexts. Secondly, the study underscores the importance of considering diverse cognitive styles, such as Field Reliance Freedom (FRI), when evaluating the effects of metacognitive awareness and technology use on academic success. Moreover, the findings suggest that integrating technology with metacognitive strategies can significantly influence academic achievement, offering promising avenues for enhancing teaching methods. Lastly, the study's use of quantitative analysis with SPSS demonstrates the practicality and efficacy of statistical tools in educational research for deciphering intricate relationships among variables. The study has several limitations. Firstly, its focus on the Tirupur district restricts the generalizability of findings to a wider population. Secondly, relying solely on questionnaire data may overlook nuanced metacognitive awareness aspects and technology usage. Additionally, the cross-sectional design limits insights into long-term effects and causal relationships. Lastly, the absence of qualitative data or in-depth interviews obstruct a thorough comprehension of students' experiences and perceptions related to metacognitive strategies and technology integration in the learning process.

6. RESEARCH CONCLUSION

Metacognition is the restriction of students to do all it takes to Create logical plans for addressing the problems they face, to overview unendingly results and to adjust the strategy subject to the circumstance, taking into account the utilization of their earlier information. By selecting the appropriate mental tool in this way, metacognition assists students in successfully achieving a single objective. The review, moreover, plans to make sense of the relationship and effect of metacognitive consideration and improvement use on understudies' savvy accomplishment. The 500 helper school students in the Tirupur area wrap up the outline survey. Students' academic performance, innovation use, and metacognitive mindfulness are the subjects of this

review. Likewise, it recognizes the impacts of innovation use and metacognitive care on the scholarly progress of understudies going to discretionary schools. The data that was accumulated were examined by the audit using SPSS. To perceive the association between academic motivation and metacognitive care, basic condition exhibiting was utilized. What's more, this technique was utilized to examine the connection between scholastic motivation and metacognitive care. The mean, standard deviation, T-test, thing second relationship, various association assessments, MANOVA, and Chi-square test are utilized to look at the gathered information. In this survey, development use and metacognitive care decidedly affect the scholastic outcome of understudies in discretionary schools. The importance was endeavoured through the assessment of the P-respect at an importance or alpha degree of 0.05%. Also, the alpha scores of the stock infer that the stock is inside steady. The review's outcomes check the utilization of improvement and metacognitive consideration framework impacts understudies' Scholarly accomplishment. Regardless, the findings support evaluating educational achievement from two distinct perspectives: development use and metacognitive care.

Statements and Declarations

Conflict of Interest

The writers say there isn't any conflict of interest.

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Data Availability Statement

This article does not apply to data sharing since the current study did not generate or analyse any datasets.

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Abbreviations

FDI	Field Dependence-Independence
MA	Metacognitive Awareness
SPSS	Statistical Package for the Social Sciences
PST	Prospective Science Teachers
LA	Learning Analytics
MAI	Metacognition Awareness Inventory
SD	Standard Deviation
INT	Intermediates
MANOVA	Multivariate Analysis of Variance
BTU	Boys in Technology Usage
GTU	Girls in Technology Usage
RTU	Rural Students in Technology Usage
UTU	Urban Students in Technology Usage
BMA	Boys in Metacognitive Awareness
GMA	Girls in Metacognitive Awareness

RMA	Rural in Metacognitive Awareness
UMA	Urban in Metacognitive Awareness
BAA	Boys in Academic Achievement
GAA	Girls in Academic Achievement
RAA	Rural in Academic Achievement
UAA	Urban in Academic Achievement
AA	Academic Achievement