

ASSESSMENT OF THE EFFECTIVENESS OF METACOGNITION AND TIME-MANAGEMENT STRATEGIES ON STUDY BEHAVIOUR OF SECONDARY SCHOOL STUDENTS IN OSUN STATE, NIGERIA

BY

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Abstract

The study investigated the study behaviour of secondary school students in Osun State, Nigeria and determined the effect of Metacognition Strategy (MS) and Time-Management Strategy (TM) on the students' study behaviour.. The study employed the pre-test post-test control group experimental design. The population comprised all senior secondary school students in Osun State during the 2022/2023 academic session. A school was selected for the study using the purposive sampling technique. The school population comprised 410 students from which 164 students were selected. 66 students that manifested very poor study behaviour were selected for participation in the treatment programme. An instrument titled Study Behaviour Inventory (SBI) was used to collect pretest and posttest data for the study. The instrument was tested for validity and reliability. Data collected were analyzed using inferential statistics such as t-test and Analysis of Covariance (ANCOVA). Findings revealed that the efficacy of metacognitive strategy training in enhancing the study behaviour of students was significant. Also, a significant effect of time management strategies in improving study behaviour was discovered. The study concluded that metacognition and time-management strategies were effective strategies for improving secondary school students' study behaviour but time-management strategy was more effective than metacognition strategy in improving students, study behaviour.

Keywords: Metacognition, Time-Management Strategies, Study Behaviour

Introduction

Devoting one's time and energy to the pursuit of knowledge is what is meant when talking of studying. It is a process that, after some practice, has become second nature and requires little or no mental effort to carry out. Study behaviour is a method for learning; it is a set of abilities that deals with things like taking in new material, organizing it, and preparing for tests. All academic disciplines can benefit from this distinct technique, which can be learned, unlearned, and relearned in a relatively short amount of time. Study behaviour might involve time-management and motivational approaches, among others, that improve a person's capacity to study, retain, and recall material that aids in passing examinations. The most influential factor on students' academic success, according to their own assessments, is their study behaviour. The fact that students cannot be expected to learn all they need to know about a subject or a job from classroom instruction and extracurricular activities has a major impact on education quality (Sakirudeen & Sanni, 2017). What constitutes students' study behavior is the sum of what they learn both in and out of class. Osa-Edoh and Alutu (2012) found a strong association between students' study behaviour and their academic achievement, therefore it is clear that students should make an effort to develop good study behaviour if they want to do better in school.

The study behaviour of students, as an indication of the attainment of educational objectives, requires careful examination if Nigerian education is to remain relevant and up-to-date. The reason is that educational quality is determined by the inputs and processes that result in outcomes. The inputs in education involve the teachers,

classrooms, instructional materials and financial resources, while the processes involve teaching and learning which eventually lead to the outcome known as the academic performance and this is defined by Scott (2012) as how well a student completes his or her tasks and studies. Study Behaviour of students is one of the fundamental criteria by which effective teaching-learning activities are measured. That is, how well the needs and interests of learners are being met and how well the learners are guided and supported to male achievement. Appropriate study behaviour for effective academic performance of students in secondary school is the focus of this study because secondary school education is an important level among all levels of education in Nigeria. It is also an important sector for the development of the individual and the nation (Achoka, *et al.* 2007). Secondary school education is also an important stage where students make transition into the higher institutions of their choices. The higher institution Okebukola (2008) describes as a place where high levels of human resources that drive the economy and ensures rapid societal transformation are provided. Alaka and Obadara (2013) submitted that secondary education in Nigeria is the pivot of the entire educational system. It is also noted that secondary education is fast losing its significance due to poor academic performance of students in public examinations. This submission was backed up by the mass failure of students in public examinations which has obviously justified the falling standard of secondary school education in Nigeria.

As stated by Federal Government of Nigeria (NPE, 2004), the broad goals of secondary education in Nigeria are to prepare individuals for purposeful living within society and to achieve higher education. The extent to which these goals are achieved can be determined by measuring students' academic performance in secondary school. The aforementioned information makes it crystal evident that Osun State secondary school students are severely underperforming academically. Stakeholders in education are deeply worried about the public secondary school pupils' dismal academic performance, which could usher in a new age of educational decadence if it persists (Egede, 2014). Consequently, the goal of producing self-sufficient individuals will not be met, leading to higher unemployment rates and moral decay in society due to a dearth of imaginative and original thinkers and the near-eradication of moral education in secondary schools. More so, the dreams of parents who have great expectations for their children's academic success and social standing may eventually fade away. This study aimed to compare the efficacy of metacognition with that of time-management techniques as treatments for encouraging healthy study behaviour.

There was a belief that metacognition technique would help students learn better by encouraging them to consider not only what they already know, but also who they are, what they want to know, and how they may get there. The ability to reflect on one's own learning and teaching is crucial. If they want to develop professionally, assess their own progress, and stay up with their students' demands, teachers need to exercise reflective thinking in the classroom. In order for students to be well-prepared for their futures, it is crucial to encourage them to reflect regularly so that they can establish their own reflecting practices and learn metacognition abilities. For young students who are just starting out and are having trouble expanding and maintaining their vocabulary, Diaz (2015) investigated the efficacy of a metacognition method. Participants were able to boost their vocabulary learning by becoming more self-aware of their learning approach and by using metacognition strategies, which was a good outcome of the training.

An effective time-management strategy is a problem-solving tool that students can use to enhance their study habits. It entails setting study goals, prioritizing study tasks, deciding how much time to devote to studying, and being prepared for the unexpected. Time management has addicting effects and is a direct predictor of academic improvement (Poraskari & Shahryari, 2014). Both students' study habits and their methods for managing their time effectively affect their academic achievement, with the former making the most impact. Therefore, it is crucial for the researcher to examine the relationship between metacognition and time-management strategies as they pertain to the study behaviour of secondary school students in Osun State. This will help improve academic performance by encouraging students to practice good study behaviour and comparing the effects of these two strategies. The role of

metacognition in enhancing students' self-regulation, academic performance, and cognitive development has been a growing focus of contemporary educational research. Several recent studies have explored how the integration of metacognitive strategies contributes to improved learning outcomes across science, mathematics, and general education.

Rasheed and Zafar (2023) examined the application of metacognitive strategies in secondary school science instruction using a quasi-experimental pre- and post-test design. Their findings revealed that embedding metacognitive approaches within science lectures significantly enhanced students' self-regulation, self-consciousness, and overall learning proficiency. Similarly, Jatmiko, Retnawati, and Rohman (2025) concentrated on reducing cognitive load in mathematics learning by developing the DHANO model, which includes phases such as self-regulation, planning, evaluation, and reflective journaling. Grounded in the ADDIE framework, their study demonstrated that structured metacognitive development supports individualized problem-solving and fosters deeper engagement with learning tasks. In alignment with these findings, Ellah, Nworgu, and Achor (2018) assessed cognitive levels and metacognitive awareness among senior secondary science students, particularly those with low academic ability. Their correlational study revealed that deficiencies in cognitive skills increased awareness of metacognitive processes, influencing both surface- and deep-learning approaches. Interestingly, while male and female learners exhibited comparable study processes, their levels of metacognitive awareness differed, suggesting gender as a potential moderating variable.

Further empirical evidence supports the positive influence of metacognition on academic achievement. Famarin (2024), through an experimental study, demonstrated that students taught with metacognitive strategies outperformed peers taught with traditional methods in general science. Similarly, Ishak, Oderinde, and Ahmad (2025) synthesized evidence across contexts, identifying four dominant themes: metacognition and learning outcomes, educational efficiency, moderators and mediators, and metacognition assessment. Their findings showed that metacognitive interventions improved not only academic performance but also critical thinking, self-efficacy, and autonomy across STEM and humanities disciplines. Parallel to the discourse on metacognition, research on time management emphasizes its crucial role in self-regulated learning. Fu et al. (2025) revealed strong correlations between time management, self-control, study engagement, and reduced mobile phone dependence. Their mediation analysis highlighted both direct and indirect pathways linking time management to study engagement. Complementing this, Holili et al. (2024) evaluated time management training among junior high school students in Proppo and found that structured prioritization and scheduling enhanced concentration, productivity, and learning outcomes. These findings reinforce the theoretical basis of self-regulated learning, highlighting the integration of time management into educational practice.

Additional studies further contextualize time management as a determinant of academic success. Stratified analyses in Cavite schools revealed developmental differences, with senior high school students demonstrating more advanced time management skills compared to their junior counterparts, albeit under increased academic pressure. Similarly, Siresha and Kodali (2024) identified demographic factors such as gender, socio-economic status, and education level as predictors of time management effectiveness. Their results showed that female students performed better in handling distractions, while socio-economic background significantly influenced the adoption of effective study techniques. Taken together, these studies underscore the interrelatedness of metacognition and time management as central components of self-regulated learning. Metacognitive strategies equip learners with tools to monitor, plan, and evaluate their cognitive processes, while effective time management ensures structured task execution and reduced cognitive overload. Both domains, therefore, contribute synergistically to improving learning efficiency, fostering academic achievement, and preparing students for adaptive lifelong learning.

All parties involved in education in Osun State are deeply concerned about the recent poor academic performance of secondary school students. As a result, the blame has been swiftly placed on teachers, school funding, instructional materials, curriculum, school location, class size, parents' income and family type, students' intelligence, time-

management skills, and study behaviour, as well as on the lack of effective educational reforms. Stakeholders in education believe that students' study behaviour will improve if they are exposed to strategies for managing study behaviour. Metacognition and Time-management strategies were perceived to inculcate good study behaviour but the comparative effectiveness of these strategies has not been ascertained

Study Behaviour which is one of the indicators of educational goals achievement, should be well considered among secondary school students. This is because the inputs and processes involved in education which lead to outcomes determine the quality of education. The inputs in education involves the teachers, students, classrooms, instructional materials, financial resources and study behaviour. The processes involve teaching and learning which eventually lead to the outcome known as the academic performance. If students continue to fall short of intellectual standards, a new era of educational decadence may begin. If students continue to fall short of intellectual standards, a new era of educational decadence may begin. Society could see a rise in unemployment and moral decay due to a shortage of original thinkers and a near-collapse of moral education in secondary schools, and students may not become economically and politically independent. More so, the dream of parents seeing their children succeed academically and rise to prominent positions in society may remain unrealistic. Therefore, teaching and learning are said to be inadequate, uninteresting and not stimulating when the students' study behaviour is poor but when good study behaviour is achieved, teaching and learning are said to be excellent and enthusiastic, hence this study.

Objectives of the Study

The specific objectives of the study were to:

- i. determine the effectiveness of metacognition strategy in improving the study behaviour of secondary school students in Osun State;
- ii. ascertain the effectiveness of time-management strategies in improving the study behaviour of secondary school students in Osun State;

Research Hypotheses

In order to further achieve the stated objectives of the study, the following research hypotheses were postulated.

Ho1 Metacognition strategy will not significantly improve the study behaviour of secondary school students

Ho2 There is no significant effect of time-management strategy on the study behaviour of secondary school students

Methodology

This study adopted pre-test post-test control group designs. Using the pre-test post-test control group design, the participants were randomly assigned to experimental and control groups. The treatments were introduced only to experimental participants after which the experimental and control groups were measured on the dependent variable. The researcher then compared the groups on the post-test. The research design is presented in Table below:

Group	Pre-test	Independent variable	Post-test
Group Ae	01	X1: MS	02
Group Be	03	X2: TS	04
Group Cc	05	Xc: Placebo	06

As shown in the Table above; X1 and X2 are the treatment 1 and 2 respectively; Xc is the placebo for the control group. 01, 03 and 05 represents the pre-test score for experimental groups Ae, Be and control group Cc, while 02, 04 and 06 are the respective post-test scores. Furthermore;

X1 represent Treatment 1, Metacognition Strategy (MS)

X2 represent Treatment 2, Time-Management Strategy (TS)

Xc represents Placebo/Control.

The study population consisted all secondary school students in Osun State. Based on available statistics of secondary school students as provided by the Ministry of Education Osun State, there were 394 secondary schools in Osun State, with a total population of 139465 of which SS1 and SS2 consisted of 47,452 students at the beginning of the 2022/2023 academic session, while the population of the school selected for the study comprised 410 students.

A sample of 164 students was selected for the study using the multistage sampling procedure. One research instrument was used for the study. The SBI, adopted from Adeyemo's (1986) Study Habit Questionnaire, measures students' study behaviour. The SBI is made up of two parts. Part A of the instrument requires participants to supply information which include sex, age and class. Part B consists of forty items subdivided into four sections. The items cover four major dimension of students' study behaviour namely time-management, study concentration, study techniques and test-taking skills. Eighteen of the forty items expressed bad study behaviour and twenty-two items expressed good study behaviour. Participants were required to indicate on a four point scale how often they engage in each study behaviour.

The validity of the Instrument was determined through face and construct validation methods. To determine the reliability of the Instrument, the Instrument was administered twice to fifty-five senior secondary school students of St Phillips Anglican Grammar school, Ile-Ife at an interval of three weeks. The SBI yielded a test-retest reliability coefficient of 0.71 and the administration of SBI was further subjected to internal consistent reliability which yielded a reliability coefficient of 0.83. The coefficient was considered high enough to justify the reliability of the Instrument.

The instrument Study Behaviour Inventory (SBI) was used to collect data for the study. Administration of the instrument was carried out by the researcher. The inventory was administered directly on 164 students. Sixty-six (66) participants with poor study behaviour were randomly assigned into experimental and control groups. At the end of the treatment, the instrument was re-administered on the 66 participants. After the completion of the treatment programme, both the treatments and control groups went through the post-test assessment.

Data for the study consisted of subjects' pre-test and post-test scores on the research instrument. The scores were analyzed using inferential statistics such as T-test and Analysis of Covariance (ANCOVA). The research hypotheses were tested at 0.05 level of significance.

Result

Hypothesis 1: Metacognition strategy will not significantly improve the study behaviour of secondary school students

Table 1: Effectiveness of Metacognition Strategy on Study Behaviour

Source	Type III Sum of Squares	Df	Mean Square	F	Sig.	Partial Eta Squared
Corrected Model	1246.112a	2	623.056	3.019	.061	.140
Intercept	4146.829	1	4146.829	20.091	.000	.352
Pretest	246.112	1	246.112	1.192	.282	.031

Group	1163.084	1	1163.084	5.635	.023	.132
Error	7636.988	37	206.405			
Total	578660.000	40				
Corrected Total	8883.100	39				

R Squared = .140 (Adjusted R Squared = .094)

Dependent Variable: Post-test score on study behaviour

Table 1 presents the results of the effectiveness of metacognition strategy on the study behaviour of secondary school students in Osun State. From the Table, results show no significant difference in the participants' pretest scores, indicating that there was no bias in the selection of the participants with regards to their scores on study behaviour. This can be further confirmed by the mean difference and p values presented in Table 1. However, the results showed that treating participants with metacognition in comparison to the control group was significantly effective in improving study behaviour [$F(1, 37) = 5.635, p < 0.05$]. Hence, the hypothesis is rejected, and it can therefore be concluded that metacognition strategy significantly improved the study behaviour of secondary school students.

Hypothesis Two: There is no significant effect of time-management strategy on the study behaviour of secondary school students

Table 2: Effectiveness of Time-Management Strategy on Study Behaviour

Source	Type III Sum of Squares	Df	Mean Square	F	Sig.	Partial Eta Squared
Corrected Model	2748.421a	2	1374.210	10.600	.000	.364
Intercept	5232.849	1	5232.849	40.366	.000	.522
Pretest	422.796	1	422.796	3.261	.079	.081
Group	2617.825	1	2617.825	20.194	.000	.353
Error	4796.554	37	129.637			
Total	602661.000	40				
Corrected Total	7544.975	39				

R Squared = .364 (Adjusted R Squared = .330)

Dependent Variable: Post-test score on study behaviour

Table 2 presents the results of the effectiveness of time-management strategy on the study behaviour of secondary school students in Osun State. From the Table, results show no significant difference in the participants' pretest scores as $p(0.079)$ is greater than the 0.05 threshold. This indicates that there was no bias in the selection of the participants with regards to their scores on study behaviour scores. This is further confirmed by the mean difference and p values presented in Table 2. Moreover, result showed that participants in the time-management group in comparison with the control group showed significant effectiveness in their study behaviour [$F(1, 37) = 20.194, p < 0.05$]. Hence, the hypothesis is rejected, and it is therefore be concluded that time-management strategy significantly improved the study behaviour of secondary school students. In addition, the results showed that the model yielded an R-squared of 0.364 with an Adjusted R-Squared of 0.330. This implies that the model can account for at least 33.0% and at most 36.4% of the variance observed in the improvement of study behaviour among the participants.

Discussion

Findings from the first hypothesis clearly demonstrate the efficacy of metacognitive strategy training in enhancing the study behaviour of students. The statistically significant improvement recorded among experimental participants, compared to the control group, indicates that explicit training in metacognitive approaches equips learners with tools for effective self-regulation. Components such as the exploration of higher-order cognition, reflected in declarative

knowledge—knowledge that can be verbalized, written, and explained—contributed to this effect. Equally, learners' ability to reflect on what they know, their learning identities, and their desired growth trajectory highlights the transformative potential of metacognition in fostering both personal and professional development. This supports earlier findings by Georgiades (2004) and Leutwyler (2009), as well as more recent contributions by Rasheed and Zafar (2023), who established that metacognitive strategies integrated into science instruction significantly improve self-regulation and learning proficiency.

The current results also align with Diaz (2015) and Scot (2010), who emphasized that adherence to structured metacognitive principles enhances academic performance. Moreover, Jatmiko, Retnawati, and Rohman (2025) illustrated through the DHANO model that metacognition is not only a reflective process but also a systematic framework enabling learners to plan, monitor, and evaluate their thought processes, thereby reducing cognitive load in mathematics learning. Similarly, Ellah, Nworgu, and Achor (2018) confirmed that metacognitive awareness explains substantial variance in study processes among low-ability science students, underscoring the broader applicability of the present findings. Collectively, these studies affirm that fostering metacognitive awareness equips learners with adaptable strategies for problem-solving and improved study behaviours.

Findings from the second hypothesis revealed a significant effect of time management strategies in improving study behaviour. The marked difference between experimental and control participants underscores the role of structured time management as a remedy for study-related challenges. This effectiveness appears to derive from its built-in components such as clock-based reminders, scheduling, prioritization, goal setting, and task sequencing. For instance, participants trained to use alarms for reminders or to design personalized study timetables reported more disciplined engagement with their learning activities. Students who perceived themselves as having greater control over their time demonstrated superior study behaviours and higher academic performance, corroborating earlier results by Stinebrickner (2004), Nonis (2006), and Kelly (2004).

The present findings are further reinforced by recent scholarship. Fu et al. (2025) established that time management directly predicts study engagement while also exerting indirect effects through self-control and reduced mobile phone dependence. Likewise, Holili et al. (2024) confirmed that time management training enhances concentration, productivity, and learning outcomes in junior high school students, echoing the principles of self-regulated learning. Evidence from Cavite schools also shows developmental differences, with senior high school students exhibiting more advanced time management abilities compared to their junior counterparts, though under higher academic demands. Additionally, Siresha and Kodali (2024) demonstrated that demographic factors such as gender, socio-economic background, and level of education significantly shape time management effectiveness, with female learners showing better outcomes in managing distractions.

Together, these findings substantiate that effective time management strategies not only address the immediate issue of students' busy lifestyles but also foster sustainable study habits that lead to long-term academic success. The convergence of current and prior studies emphasizes the dual role of time management: as a skill set enabling efficient allocation of cognitive resources and as a predictor of enhanced study behaviours across diverse learner groups.

Conclusion and recommendation

In view of the findings from the study, it was concluded that students need to improve their metacognitive ability, to spend more time in their studies and the need for them to apply more effective study behaviour which will help them to improve on their academic achievement. Metacognition and time-management are effective strategies for improving study behaviour of secondary school students for excellent academic performances. Thus, it was recommended that there is need to ensure that every student undergoes trainings in good study behaviour throughout

their academic career in secondary school. The training, which should come up preferably during the orientation week would go a long way in preparing the student adequately to meet the challenges of their academic career. The teaching of metacognition and time-management strategies should be incorporated into the school curriculum in Nigeria. Finally, it is necessary to review the Nigerian secondary school curriculum for the training of school counsellors such that topics in study behaviour are emphasized in the training and certification of school counsellors.

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