

META-COGNITIVE SKILLS AS PREDICTORS OF ACADEMIC SELF-EFFICACY AMONG SECONDARY SCHOOL STUDENTS IN CALABAR MUNICIPALITY OF CROSS RIVER STATE, NIGERIA

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Abstract

The study investigated the contribution of meta-cognitive skills to the prediction of academic self-efficacy of senior secondary school students in Calabar Municipality of Cross River State, Nigeria. Specifically, it determined the joint contribution of planning skills, monitoring skills and evaluation skills to academic self-efficacy of students. Correlational research design was employed in this study. The population of the study consisted of 6,210 SS2 students in secondary schools in the study area. A sample size of 376 students was selected using Taro Yamane's sample-size formula at 0.05 level of precision while proportionate stratified random sampling and simple random sampling were used to select the sample. A questionnaire structured under the title 'Meta-Cognitive Skills and Academic Self-Efficacy Questionnaire (MSASEQ)' was used to collect data from respondents. The questionnaire was validated by some specialists in Educational Psychology and Measurement and Evaluation. Cronbach's alpha method was used to obtain a reliability index of 0.87. Multiple linear regression was used to analyse the data at 0.05 alpha level of significance. Results of the study showed that planning skills, monitoring skills and evaluation skills, collectively predicted academic self-efficacy of the students significantly; the total explained variance being 12.1% of the academic self-efficacy. Evaluation skills made the most significant positive contribution to the prediction of academic self-efficacy of the students; planning skills contributed next; while monitoring skills made no significant independent contribution to the prediction of academic self-efficacy of students. The study concluded that meta-cognitive skills are useful in making students confident about their ability to carry out

academic tasks. It recommends that school administrators should integrate meta-cognitive strategies in classroom instructional activities; teacher training programme on the use of meta-cognitive strategies should be provided; and setting goals, monitoring self-performance and reflection through the counselling programme should be encouraged and promoted at the school and parental level.

Keywords: Meta-cognitive skills; academic self-efficacy; secondary school students; self-regulated learning,



Introduction

At secondary school, not only is there an understanding of the subject but learners must also comprehend and guide the thinking by which they learn. Learners' thinking awareness of how they learn are referred to as metacognitive awareness and normally involve planning, monitoring, and evaluative processes (Tsai et al., 2024; Egaga et al., 2025; Panigrahi et al., 2025). Self-efficacy for a learner's success in academics is an individual's belief about their capability to organize and perform actions required to succeed in academically related activities (Adie et al., 2026; Schunk, 2023; Graham, 2022). Both are pertinent to motivation, learning autonomy, persistence, task completion, problem solving, and academic success since confidence determines which strategies they adopt, while successful regulation might reinforce this confidence through mastery (Adie et al., 2026; Graham, 2022; Meece, 2023). The relation thus can be considered reciprocally interactive, although within this study the variable was operationalized as metacognitive skills the predictor and academic self-efficacy the outcome.

Globally, many scholars have drawn attention to both cognitive and motivational resources that allow students to cope with and control difficult learning tasks. Planning refers to actions that learners take before and during learning such as specifying goals, analyzing the task demands, developing a set of task relevant goals and actions, preparing and planning learning activities, and allocating time to tasks (Zimmerman et al., 2023; Ebele & Agbade; 2020; Effiong, & Agbade, 2016; Ihekoronye et al. 2020). Planning helps students translate their general academic goals into specific actions and plan for potential obstacles. Self-regulation involving the learner gaining control of one's thinking and learning process may also boost students' self-confidence in doing their assignments, comprehending complicated texts, sitting for exams and even finishing tasks as intended (Graham, 2022; Meece, 2023).

Monitoring, is the learner's ability to maintain focus while working on a task, while evaluation assesses the outcomes of the learning process as well as the strategies used during and after completion of the task (Nilson & Zimmerman, 2023; Williams, 2024; Adie et al., 2026). While monitoring allows students to detect when learning is faltering and then adapt or change strategies as necessary, evaluation allows students to measure the progress that they have made against specific learning outcomes, identify their strengths and weaknesses and enhance their subsequent learning experiences (Nilson & Zimmerman, 2023). It all can be explained as a regulatory cycle; students plan their approach, they monitor its implementation, and they evaluate how successful the approach turned out to be (Nilson & Zimmerman, 2023; Onah et al., 2023; Meremikwu et al.2022; Adie et al 2019; Ibu et al.2019).

Various studies have reported various relationships between metacognition and self-efficacy across different educational systems, though vary in the direction of the relationship. In Turkey, Bagci and Unveren (2020) aimed to investigate the extent to which metacognitive awareness of reading strategies is related to reading-comprehension self-efficacy among 380 eight grade students. The study employed correlational survey design and the instruments for

data collection included the Metacognitive Awareness of Reading Strategies Inventory and the Self-Efficacy Scale in Reading Comprehension. Multivariate Analysis of Variance and some additional procedures were used for the analysis. The study revealed that general reading, problem solving and support reading strategies significantly predicted reading self-efficacy in visual comprehension and reading self-regulation domains. The findings provide a direct support for the proposed metacognitive skills self-efficacy relationship, but because of limiting it only to reading comprehension, it can hardly explain general academic self-efficacy (Adie, 2025; Ogunode, & Agbade, 2023; Olofu et al. 2019; Opara et al.2020; Agbade & Ironbar, 2017).

In addition, in a study conducted by Yelge and Dagyar (2020) the relationship between metacognitive awareness, self-efficacy and foreign-language anxiety was examined through structural equation modeling for 285 seventh and eighth graders attending to a secondary school in Turkey. The instruments used to collect data included a personal information form, the Foreign Language Classroom Anxiety Scale, the Self-Efficacy Questionnaire for Children and the Junior Metacognitive Awareness Inventory. According to the findings, students possess moderate level of metacognitive awareness, self-efficacy and foreign-language anxiety (Egaga & Adie, 2025; Adie et al. 2022; Ibu et al. 2019; Igyu et al. 2022; Adie, et al. 2026; Meremikwu et al. 2022). The findings revealed interaction effects between metacognitive awareness and self-efficacy and foreign-language anxiety, however the impact of metacognitive awareness on the relation between self-efficacy and foreign language anxiety was not statistically significant. That supports, with a cautionary note, that the relationship between the aforementioned variables depends on the specific discipline as well as statistical modeling employed (Adie & Oshie 2026).

More recent experimental evidence has lent stronger support to the influence of metacognitive skills on students' self-efficacy. Arianto and Hanif (2024) explored the separate and interactive effect of metacognitive strategies and self-regulated learning on science self-efficacy and science problem-solving on a sample of 100 fifth grade students from Surabaya and Sidoarjo. The researchers employed a true-experimental design of a 2 2 factorial Solomon four-group design using post-test only and questionnaires to measure science self-efficacy and problem solving ability and analysis of variance to analyze data using SPSS. The results of the study revealed that metacognitive strategy and self-regulated learning had a significant effect individually in increasing students' science self-efficacy and science problem solving ability, although no significant interactive effect. Thus, metacognitive strategies can reinforce self-belief though restricting the sample to primary pupils prohibits direct generalisation to secondary students.

In an experiment carried out by Meher et al. (2024), to determine the effectiveness of the metacognitive training programme on higher secondary students' self-efficacy in Sambalpur. In two government aided higher secondary schools, random sampling procedure was employed in selecting schools, then a non-equivalent control group pre-test and post-test quasi-experimental design was adopted in selection of students into experimental and control groups, comprised of 41 and 38 students, respectively. The experimental group was exposed to various metacognitive trainings like think aloud process, brainstorming, concept map and self assessment. While the control group was exposed to the traditional teaching methods. Data were collected through the 'self-efficacy scale of Sherer-Maddux ' (culturally adapted version) and analysed by Analysis of Covariance (ANCOVA). The training has improved significantly the students' general and social self-efficacy in general. However, interaction between the teaching methods with the students' gender and caste, and self-efficacy has not been found significant. This research lends support for use of metacognitive learning skills development self-belief of the higher secondary students but its outcome measurement using

general and social self-efficacy instead of academic self-efficacy limits the generalization for the present study.

In other developing countries evidence from studies have provided similar evidence suggesting that a student's confidence is closely related to his ability to control his own learning. For example, Sariyatun et al. (2025) surveyed 116 Grade 10–12 students from Central Java, Indonesia. They examine the effect of digital literacy and metacognitive skills on students' self-efficacy and the mediating role of social support. The data from survey questionnaire were analyzed using confirmatory factor analysis to evaluate construct validity and reliability then analyzed using partial least squares structural equation modeling (PLS-SEM). The finding found that metacognitive skills have a significant influence on student's self-efficacy with the beta value = .675 ($p < .001$) and that social support has a significant strengthening effect on the relationship. While these results provide direct evidence on metacognitive skills as predictors of self-efficacy for high school students, they do not break down metacognition into planning, monitoring and evaluating skills, but treat metacognitive awareness as a singular construct.

In African, the study conducted by Mwangi, Mwaniki, and Mutua (2024) investigated the relationship between metacognition and academic performance of Form two students in Nairobi County, Kenya, with a sample of 376 students. Correlational design was utilized in this study and a measure of metacognition was used in conjunction with student's academic performance data to carry out a Pearson product-moment correlation and a multiple regression analysis. A significant relationship between metacognition and academic performance, $r(363) = .13$, $p < .05$, was established, with both metacognitive knowledge and metacognitive regulation yielding positive predictive indices. Although the study did not include academic self-efficacy as outcome variable, it has established relevance of metacognitive regulation for African secondary students and hence further studies on relationship between metacognitive regulation and motivational outcome are needed.

Similar results are available from Nigeria, where Ojo et al. (2024) examined metacognitive awareness, self-efficacy and Biology performance among 180 Senior Secondary Two (SSII) students purposively sampled from six public secondary schools in Ifo Local Government Area of Ogun State. The study design was correlational survey research design with the use of adapted 52-item Metacognitive Awareness Inventory, self-efficacy scale and the students' Biology scores to collect the data. The instruments had been reported to have Cronbach alpha of .73 and .82 for metacognitive awareness scale and self-efficacy scale, respectively. Descriptive statistics, Pearson correlation analysis and multiple regression analysis were employed in analyzing data. Findings indicate a positive significant relationship between metacognitive awareness and self-efficacy, $r = .16$, $p < .05$, whereas self-efficacy correlated negatively with regulation of cognition alone. The study is indicative of a link between metacognition and self-efficacy but not necessarily of how individual aspects of cognition predict self-efficacy.

Similarly, Elom and Aja (2024) have added related evidence to Nigeria, when they investigated the effect of a metacognitive learning-cycle model on secondary school students' Physics achievement in Ebonyi State. Using quasi-experimental research design, a sample of 65 secondary school students was selected from the population of 924 Senior Secondary Two students in the State. Data were collected using Physics Achievement Test, which has been validated and whose Kuder-Richardson 20 reliability coefficient is .82, and was analyzed using mean and analysis of covariance. It was found that the metacognitive learning-cycle model enhanced the students' Physics achievement.

Though the study corroborates the importance of metacognitive instructional strategy in Nigeria but focused only on achievement as dependent variable and not on academic self-efficacy as well as treated planning, monitoring and evaluation together instead of as

independent predictors. The reviewed evidence therefore leaves behind conceptual, methodological and geographical lacunas. A lot of the previous studies considered meta-cognition as a unitary concept, analyzed academic achievement and not academic self-efficacy as dependent variables, concentrated on only one subject, utilized primary, secondary, tertiary or non-Nigerian population. Even those conducted in Nigeria did not jointly assess the relative contributions of planning, monitoring, and evaluation as independent predictors of the general academic self-efficacy of secondary school students, just as no current Nigerian studies in this line was found to cover students of Calabar Municipality Local Government Area of Cross River State.

This thus raises a need to ascertain whether or not planning, monitoring and evaluation skills do collectively and individually predict academic self-efficacy among the students in Calabar. Such evidence would clarify how the three regulatory skills contribute jointly and singly towards students' beliefs about their ability to cope with academic tasks in this environment.

Purpose of the study

The main purpose of this study was to examine meta-cognitive skills as predictors of academic self-efficacy among secondary school students in Calabar of Cross River State, Nigeria. Specifically, the study sought to:

1. ascertain the joint prediction of meta-cognitive skills (planning skills, monitoring skills, and evaluation skills) on academic self-efficacy among secondary school students in Calabar Municipality of Cross River State, Nigeria.

Research Question

One research question was formulated to guide the study:

1. To what extent do meta-cognitive skills (planning skills, monitoring skills, and evaluation skills) jointly predict academic self-efficacy among secondary school students in Calabar Municipality of Cross River State, Nigeria?

Research Hypothesis

The following null hypothesis is formulated and will be tested in the study:

1. Meta-cognitive skills (planning skills, monitoring skills, and evaluation skills) do not jointly and significantly predict academic self-efficacy among secondary school students in Calabar Municipality of Cross River State, Nigeria.

Methodology

Correlation research design was employed in this study to ascertain the degree to which meta-cognitive skills (planning, monitoring and evaluation skills) correlate with academic self-efficacy among Senior Secondary school students in Calabar Municipal Local Government Area of Cross River State, Nigeria. The population for this study consisted of six thousand, two hundred and ten (6,210) Senior Secondary school Two (SS 2) students in the secondary schools within the study area. A sample size of three hundred and seventy-six (376) students was derived using Taro Yamane's sample-size formula at 0.05 level of precision.

A proportionate stratified random sampling technique was adopted to ensure that all the sampled schools and their students are represented. The sample size was proportionately allocated to selected schools based on their SS 2 population. Thereafter, a simple random sampling method was employed to draw the respondents from the various selected schools. Structured questionnaire titled "Meta-Cognitive Skills and Academic Self-Efficacy Questionnaire (MSASEQ)" was used to elicit information from the respondents. The questionnaire consist of personal background data of respondents, planning skills, monitoring skills, evaluation skills and academic self-efficacy in the questionnaire are arranged in a

modified four points likert type scale format: Strongly Agree (SA = 4), Agree (A = 3), Disagree (D = 2), Strongly Disagree (SD = 1). Before the administration, the questionnaire underwent a face and content validation by some experts in Educational Psychology, Measurement and Evaluation for clarity, content validity, scope, coverage and appropriateness.

The reliability of the questionnaire was determined by carrying out a trial test on some students who are like study participants but excluded from the study population. Responses to the trial test were analyzed using the Cronbach's alpha method. The test resulted to a reliability of 0.87. The collected questionnaire was code and analyzed using multiple regression analysis to test the null hypothesis at 0.05 level of significance.

Result

Research Question 1: To what extent do meta-cognitive skills (planning skills, monitoring skills, and evaluation skills) jointly predict academic self-efficacy among secondary school students in Calabar Municipality of Cross River State, Nigeria?

To answer this research question, multiple regression analysis was employed. Planning skills, monitoring skills, and evaluation skills were entered jointly as the predictor or independent variables, while academic self-efficacy was used as the criterion or dependent variable. The results of the analysis are presented in Table 1.

Table 1: Summary of multiple regression analysis on the joint prediction of academic self-efficacy by meta-cognitive skills

Explainable variable	R	R ²	Adj. R ²	Std Error of the estimate
meta-cognitive skills	.348 ^a	.121	.111	5.352

Table 1 shows that the multiple correlation coefficient (R), coefficient of determination (R²), and adjusted coefficient of determination (Adjusted R²) were .348, .121, and .111, respectively. The R-value of .348 indicates a positive relationship between the combined dimensions of meta-cognitive skills and academic self-efficacy among secondary school students. Based on the adjusted coefficient of determination of .111, planning skills, monitoring skills, and evaluation skills jointly accounted for approximately 11.1% of the variation in students' academic self-efficacy. The remaining 88.9% of the variation was attributable to other factors not included in the regression model. Therefore, meta-cognitive skills jointly predicted academic self-efficacy to a relatively low extent among secondary school students in Calabar Municipality of Cross River State, Nigeria.

Hypothesis one

This study tested the hypothesis that meta-cognitive skills (planning skills, monitoring skills, and evaluation skills) do not jointly and significantly predict academic self-efficacy among secondary school students in Calabar Municipality of Cross River State.

Table 1: Multiple regression analysis of the joint contribution of meta-cognitive skills (planning skills, monitoring skills, and evaluation skills) on academic self-efficacy among secondary school students

Source of variation	SS	Df	MS	F	Sig.
Regression	487.342	3	162.447	12.439	.000 ^b
Residual	3539.254	271	13.060		
Total	4026.596	274			
Model	Unstandardized Coefficients		Standardized Coefficients		
	B		Std. Error	Beta	
					t
(Constant)	21.391	2.656			8.054
					Sig.

problem-solving thinking	.169	.066	.121	2.544	.011
decision-making thinking	.029	.068	.020	.431	.667
logical reasoning thinking	.176	.070	.125	2.524	.012

*significant at .05 level

The results of the multiple linear regression analysis presented in Table 1 showed that the regression model was statistically significant ($F(3, 271) = 12.439$), ($p < .001$). Since the probability value was less than the .05 level of significance, the null hypothesis was rejected. This indicated that problem-solving thinking, decision-making thinking, and logical reasoning thinking jointly and significantly predicted academic self-efficacy among secondary school students in Calabar Municipality of Cross River State. An examination of the relative contributions of the predictor variables showed that logical reasoning thinking had the highest positive and significant contribution to academic self-efficacy ($Beta = .125$), ($t = 2.524$), ($p = .012$). This was closely followed by problem-solving thinking, which also made a positive and significant contribution ($Beta = .121$), ($t = 2.544$), ($p = .011$). However, decision-making thinking made a positive but non-significant contribution to academic self-efficacy ($Beta = .020$), ($t = .431$), ($p = .667$). Consequently, the study concluded that problem-solving thinking, decision-making thinking, and logical reasoning thinking jointly and significantly predicted academic self-efficacy among secondary school students in Calabar Municipality of Cross River State.

Discussion of Findings

The finding revealed that meta-cognitive skills, comprising planning, monitoring, and evaluation skills, jointly and significantly predicted academic self-efficacy among secondary school students in Calabar Municipality Local Government Area of Cross River State. This implies that students' ability to establish learning goals, monitor and regulate their learning progress, and evaluate the effectiveness of their learning strategies contributes significantly to their confidence in successfully performing academic tasks. Although the proportion of variance explained by meta-cognitive skills was relatively modest, the finding demonstrates that these skills provide an important cognitive foundation for the development of students' academic self-belief.

A possible reason for this finding is that students who effectively plan their learning activities are more likely to approach academic tasks with clearly defined goals, suitable strategies, and a sense of direction. Monitoring skills enable students to identify learning difficulties, recognise errors, and modify ineffective learning methods before the difficulties become overwhelming. In the same way, evaluation skills allow students to determine whether the strategies they adopted produced the desired outcomes and identify areas requiring improvement. These processes provide students with repeated experiences of control, progress, and successful task completion, which may strengthen their confidence in their academic capabilities. The finding is theoretically justified by the self-regulated learning perspective, which maintains that learners develop stronger beliefs in their abilities when they actively plan, monitor, control, and evaluate their learning. It is also consistent with Social Cognitive Theory, which explains that self-efficacy develops partly through mastery experiences. Thus, students who successfully regulate their learning are more likely to perceive themselves as academically capable.

The present finding agrees with Meher et al. (2021), who found that metacognitive interventions involving thinking aloud, brainstorming, concept mapping, and self-assessment significantly improved the general and social self-efficacy of higher secondary school students. It also supports Babouhoun and Tabli (2024), whose study revealed a statistically significant relationship between metacognitive strategies and self-efficacy among third-year

secondary school students. Similarly, Koyuncuoğlu (2023) reported a positive relationship between metacognition and general self-efficacy, indicating that students with stronger metacognitive abilities demonstrated greater confidence in their capacity to accomplish academic tasks. Furthermore, Anyanwu et al. (2024) established a significant relationship among metacognition, self-efficacy, and self-regulated learning strategies among senior secondary school students in Ibadan, Nigeria. Collectively, these studies confirm that students' ability to plan, monitor, and evaluate their learning is associated with stronger confidence in their academic abilities.

Conclusion

It was therefore concluded that meta-cognitive skills significantly and collectively accounted for the prediction of academic self-efficacy of secondary school students in Calabar Municipality Local Government Area of Cross River State. The implication is that if a student learns to plan, monitor, and evaluate learning, such a student tends to gain the belief that he or she can successfully engage in school tasks. Thus, meta-cognitive skills form an important framework in which the self-confidence of student in their capacity to engage in school work is built up in order for effective learning to occur. There should, therefore be a conscious effort on the part of teachers, school administrators, counsellors and parents to develop these skills in students of the secondary schools.

Recommendations

1. Secondary school teachers should inculcate meta-cognitive skills into their instructional procedures to facilitate goal-setting, planning, and the appropriate and systematic execution and review of strategies employed by learners in completing academic tasks.
2. Educational Administrators and Principals should continue to provide the necessary resources and avenues for the organisation of regularly organized training and workshop sessions for teachers to assist them in acquiring the appropriate competencies that they require to enable students develop planning, monitoring and evaluative skills in every school subject.
3. Parents and school Counsellors should continually counsel and give to student the required support, feedback and encouragement needed to stimulate reflection on strengths and limitations in their academic engagement and to build their confidence to reach new height of self-efficacy

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