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EXPLORING THE INTERRELATIONSHIP BETWEEN KEY COMPONENTS: COGNITIVE, METACOGNITIVE, SOCIAL, AND AFFECTIVE STRATEGIES IN LANGUAGE LEARNING

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Abstract

This quantitative research aims to explore the motivational factors that drive students in their learning. A total of 142 individuals from a purposive sample participated in the survey. The instrument used is a 5-point Likert-scale survey and is rooted from Wenden and Rubin (1987) to reveal the variables in learning strategies namely the Cognitive Component, Metacognitive Self-Regulation, and Resource Management, as well as to identify the relationship between these variables. Respondents were Malaysian undergraduate students in a public university in Malaysia, learning English as a Second Language. Findings found that all three variables proved to be significant factors in learners' learning and that they are strongly related to one another. It was found that cognitive strategies play a significant role in enhancing language comprehension and retention. Meanwhile, the practice of critical thinking through questioning and active engagement with course materials demonstrates a moderate to high level of implementation among students. The consistent engagement with such strategies underscores the importance of active learning in language acquisition. Metacognitive self-regulation was also prominent, highlighting the approaches students adopt to monitor and control their learning processes. Additionally, the study sees that students' ability to pull together information from multiple resources considerably enhances their learning experience and outcomes. The interrelationship between the said strategies was also explored, to see how these factors collectively impact students' language learning processes. Such understanding is crucial for developing interventions to improve academic self-efficacy and foster a supportive learning environment. Hence, the findings from this research offer insights for improvement in academic curriculum and instructional design.

Keywords:*Cognitive Component; English Language; Learning Strategies; Metacognitive Self-Regulation; Resource Management*

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INTRODUCTION

The modern educational environment prioritizes personalized learning approaches to fulfill each student's distinct educational requirements. Educational institutions worldwide have started to widely adopt differentiated instruction methods which elevates the need for educators to understand student perspectives on learning strategies (Tomlinson, 2014). This research aims to explore students' perspectives on diverse learning strategies with an emphasis on cognitive, metacognitive, and resource management techniques that the literature review will elaborate on.

Given the growing complexity and interconnected nature of modern learning environments, a critical question arises: Do these various learning strategies display any significant interconnections with each other? The study examines the question by analyzing possible connections and trends among various strategic approaches students utilize according to Schunk (2005). The study aims to offer educators and policymakers valuable insights into student educational navigation patterns which will help develop more tailored teaching methodologies. This study examines cognitive strategies and self-regulation through metacognition to better understand how students perceive and implement these learning strategies in their academic experiences. In an ideal higher education setting in Malaysia, language learning strategies would be seamlessly woven into the curriculum to support students in achieving advanced language proficiency. Cognitive strategies, such as critical thinking, synthesis, and applying language knowledge, would be actively used by students to boost their understanding and communication abilities. Universities and colleges would foster an environment that promotes critical thinking and problem-solving, encouraging students to engage deeply with language materials, think analytically, and retain knowledge over the long term (Hariri, Mahmudah, & Yusof, 2025; Yusof et al., 2020).

A strong emphasis would be placed on metacognitive self-regulation, empowering students to take charge of their own learning by setting clear goals, monitoring their progress, and reflecting on their outcomes. Institutions would provide the tools and training needed for students to develop the ability to regulate their learning independently (Mat et al., 2024). This would lead to a more personalized learning experience, where students could adapt their strategies to match their individual learning styles and needs (Lashari, Awang-Hashim, & Lashari, 2023).

Optimally integrated with students having access to a wide range of learning materials, language labs and interactive learning platforms, digital resources would also be part of resource management strategies. In addition, all students in Malaysia would benefit from such facilities and higher education institutions of the country would make sure that these resources are easily available and easily accessible to all the students irrespective of their socio-economic status. Further, educators would also be competent in incorporating these resources to support learning, to develop a more enriched and supportive learning environment (Mohamad & Wan Mokhtar; Sulong, 2022).

Collaboration between students, faculty, and support staff would further enrich the learning process. As a standard practice, students would engage in peer learning, mentoring, and community workshops geared toward enhancing interaction and collaboration among students. This will not only improve students' language abilities, but also their communication, collaboration, and teamwork skills needed in the globalized world (Din et al., 2021).

Even with everything in place, the present state of higher education in Malaysia indicates discrepancies in the adoption of efficient language teaching and learning strategies. Many students face challenges in applying cognitive strategies effectively, and more often than not, they tend to resort to rote learning as a means to accomplish their objectives. In their cases, engaging in learning tasks mechanically brings about a bare minimum understanding of the task along with poor language skills (Yusof, Awang-Hashim, & Kaur, 2020; Mohamad & Wan Mokhtar, 2024).

Managing resources continues to be an important challenge because of unequal access to education and technology. Lack of access to important resources considerably obstructs the academic improvement of rural and underprivileged students (Hariri, Mahmudah, & Yusof, 2025). Inadequate training and insufficient support obstruct the effective management of resources in teaching, resulting in some resources remaining underutilized (Sulong, 2022; Lashari et al., 2023).

Absence of integrated learning continues to worsen the issues at hand. The absence of peer-teaching and other forms of academic interactions can hinder collaborative knowledge-building, stunting the growth of learners and their capability to integrate information. This profound gap emphasizes the need for a higher level of sophistication in addressing the integration of language instruction within higher education frameworks (Din et al., 2021; Lashari et al., 2023). This research investigates the interplay between language learning and cognitive, metacognitive, and resource management strategies employed in Malaysian universities. Through studying the perspectives of the students with regard to the strategies they employ toward learning, the study seeks to highlight practices that contribute to and those that obstruct efficiency in the education process.

Policymakers and educators will be able to better structure language instruction and address the multiplicity of learner needs and expectations (Yusof et al., 2020). The work is intended to confirm the assumptions and insights on the learning strategies that university students in Malaysia develop to use in the process of language learning for the sake of recommending improvements for effective language acquisition. In conclusion, this study highlights the responsibilities that higher educational institutions shouldered in enabling learners to use the languages essential for them in a globalized context.

LITERATURE REVIEW

Learning Strategies in General

Rebecca Oxford's renowned model for understanding language learning strategies, established in 1990, defines these strategies as particular actions that learners engage in to make learning more efficient, faster, enjoyable, autonomous, effective, and relevant to new situations. Oxford categorizes these strategies into two main types: direct and indirect strategies. Direct strategies entail active involvement with the language and include memory, cognitive, and compensatory approaches. Indirect strategies support and oversee language acquisition without direct engagement with the language and comprise metacognitive, emotional, and social approaches.

On the contrary, O'Malley and Chamot (1990) present an alternative cognitive framework for learning strategies, dividing them into three primary categories. Cognitive strategies involve manipulating the learning material through repetition, deduction, and translation. Metacognitive strategies encompass the planning, monitoring, and evaluation of the learning process, enabling learners to exercise control over their cognitive activities. Social and affective strategies, by contrast, emphasize interaction with others as well as the regulation of emotional states, motivation, and attitudes during the learning experience.

In a broader educational context, Weinstein and Mayer (1986) define learning strategies as deliberate behaviors and cognitive processes employed by learners to influence the encoding of information. Their framework extends beyond the domain of language learning to include general study techniques aimed at enhancing comprehension and memory retention.

Building on this foundation, Joan Rubin (1987) was instrumental in highlighting the role of learner strategies in second language acquisition (SLA). She distinguished between learning strategies, which can have either direct or indirect impacts on language development, and communication strategies that assist in conveying meaning. H. H. Stern (1992) advocated for a multidimensional framework, positing that effective language learners utilize a blend of cognitive, social, and affective strategies. Stern's approach recognizes the highly individualized nature of language learning, emphasizing the importance of adapting strategies to suit personal learning styles and specific learning environments.

Although Oxford, O'Malley and Chamot, Weinstein and Mayer, Rubin, and Stern offer varied taxonomies and theoretical orientations, they collectively affirm the central role of strategic behaviors in successful SLA. Oxford's model distinguishes between direct and indirect strategies, encompassing both practical language use and psychological support mechanisms. O'Malley and Chamot provide a similarly structured model, with a particular focus on cognitive functions. Weinstein and Mayer contribute a more comprehensive educational lens, situating learning strategies within general academic contexts. Rubin's framework introduces an important differentiation between strategies for learning and those for communication. Meanwhile, Stern’s holistic approach integrates external interaction with internal psychological processes.

This study operationalizes "learning strategies" as intentional, goal-directed behaviors and cognitive processes aimed at optimizing the effectiveness, efficiency, and overall experience of learning. These strategies include specific techniques for engaging with content, regulatory mechanisms for monitoring and guiding one’s learning process, and socially interactive practices for drawing on peer support and emotional resilience. This multidimensional perspective reflects the inherent complexity of language learning and acknowledges the necessity of a varied and personalized strategic repertoire aligned with each learner’s individual context and style.

Cognitive Components

Cognitive components refer to the underlying mental processes that enable perception, memory, language, learning, and problem-solving. Anderson (1983) identifies cognitive components as essential elements in the information processing model, where they function as building blocks in the cognitive structure that support complex mental activities. Sternberg (1985) introduces the triarchic theory of intelligence, highlighting the analytical, creative, and practical cognitive components that work synergistically to facilitate intelligent behavior. Additionally, Sweller

(2005) emphasizes the importance of cognitive load theory in understanding how cognitive components such as working memory and schema construction influence learning outcomes.

Based on the analysis of expert opinions, cognitive components can be defined as the fundamental mental processes that underpin our ability to process information, solve problems, and adapt to new situations. These components interact dynamically and are foundational for higher-order cognitive functions. This understanding emphasizes the importance of integrating multiple cognitive components to enhance overall cognitive performance and learning capabilities.

Metacognitive Self-Regulation

Metacognitive self-regulation refers to an individual's capacity to be aware of and exert control over their cognitive processes. Flavell (1979) conceptualized metacognition as comprising both metacognitive knowledge and self-regulatory strategies, which collectively enable learners to plan, monitor, and evaluate their learning activities. Building on this foundation, Zimmerman (2000) emphasized the critical role of metacognitive self-regulation in promoting academic achievement. He highlighted that it empowers learners to set meaningful goals, implement appropriate learning strategies, and make informed adjustments in response to performance-related feedback.

Schraw and Moshman (1995) further elaborated on the structure of metacognitive self-regulation, identifying three essential components: declarative knowledge, which involves understanding what strategies are available; procedural knowledge, which pertains to knowing how to implement those strategies; and conditional knowledge, which focuses on understanding when and why to apply specific strategies within a given context.

In summary, metacognitive self-regulation encompasses the processes by which learners deliberately monitor and direct their cognitive efforts toward achieving academic objectives. It involves both the knowledge of various learning strategies and the practical ability to apply and adapt them effectively. Enhancing learners' metacognitive self-regulation skills improves learning outcomes and contributes significantly to academic success.

Resource Management

In the fields of education and cognitive psychology, resource management refers to the strategic allocation and effective use of various resources such as time, effort, and learning materials—to support the attainment of educational objectives. Pintrich (2004) underscores the significance of resource management within the broader framework of self-regulated learning, asserting that learners must actively manage their time, organize their study environments, and regulate the intensity and persistence of their effort in order to maximize academic performance and learning efficiency.Weinstein, Husman, and Dierking (2000) highlight the importance of managing both internal resources (e.g., motivation and cognitive strategies) and external resources (e.g., study materials and social support) to enhance academic performance. Additionally, Zimmerman and Martinez-Pons (1986) discuss how students who are proficient in resource management tend to employ better organizational and planning strategies, leading to more effective and efficient learning.

From the reviewed literature, resource management can be defined as the strategic and efficient use of both internal and external resources to achieve specific learning objectives. Effective resource management involves planning, organizing, and monitoring resources to facilitate optimal learning outcomes. Developing strong resource management skills is crucial for students to enhance their academic performance and achieve long-term educational success.

Past Studies

Numerous scholars have explored Language Learning Strategies (LLS) thoroughly, especially in the contexts of second and foreign language learning. The research conducted by Nur Natasha Eliana et al (2024) involving 167 participants emphasized a distinct positive relationship among cognitive and metacognitive aspects, metacognitive and resource management, as well as cognitive and resource management. The results also showed that students' selection of learning strategies is primarily affected by cognitive learning styles. Additionally, students generally exhibit favorable resource management practices. The results regarding resource management show a generally positive perspective on academic challenges, although there remains room for improvement in enduring tough coursework.

An alternative study carried out by Siti Nur Shahida Md. Aziz and Parilah Mohd Shah (2020) explored students' preferences concerning language learning strategies (LLS) and analyzed how gender influences these choices. The study involved thirty third-semester students from the Polytechnic of Sultan Salahuddin Abdul Aziz Shah in Shah Alam, with information collected via a modified questionnaire. The findings showed a significant inclination towards cognitive and metacognitive strategies, akin to the study by Nur Natasha Eliana et al. (2024), whereas affective and compensation strategies were the least preferred. Moreover, the research indicated that gender exerted a statistically insignificant effect on LLS preferences.

Conceptual Framework

Successful learning requires the learners to use strategies. These strategies help learners manipulate learning materials to facilitate their learning (Rahmat, 2018). Different strategies help learners achieve different aspects of their learning process. Figure 1 illustrates the conceptual framework of the research. The foundation of this study is based on Wenden and Rubin's (1987) strategies for learning. They identified three primary learning strategies: cognitive components, metacognitive self-regulation, and resource management. Cognitive components include employing sub-strategies such as rehearsal, organization, elaboration, and critical thinking skills.. Metacognitive strategies involve the learners planning their learning. Resource management refers to sub-strategies such as environment management, effort management and help-seeking.

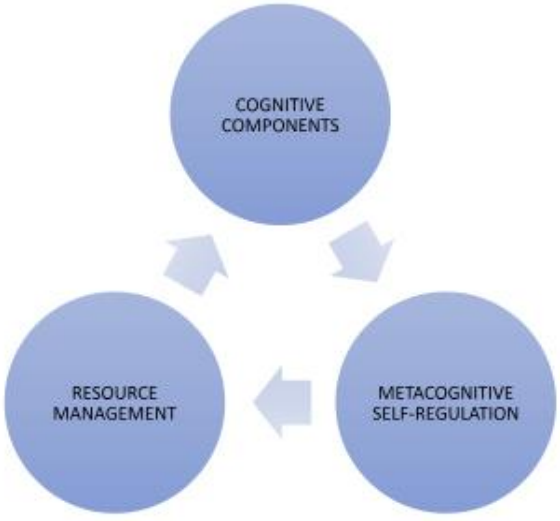

Figure 1- Conceptual Framework of the Study

METHODOLOGY

This quantitative study will look into the motivational elements that influence learning in undergraduate students. A targeted sample of 142 persons completed the poll. The characteristics shown in Table 1 were determined using a 5-point Likert scale poll informed by Wenden and Rubin's (1987) research. The questionnaire is divided into four parts. Section A contains elements related to the demographic profile. Section B covers 19 items focusing on cognitive issues. Section C contains eleven questions about metacognitive approaches. Section D has eleven things about resource management.

Table 1: Distribution of Items in the Survey

	Strategy (Keyword)		Sub-Strategy	Item	Total Items	Cronbach Alpha
B	**Cognitive Components**	(a)	Rehearsal	4	19	.905
		(b)	Organization	4		
		(c)	Elaboration	6		
		(d)	Critical Thinking	5		
C	**Metacognitive Self-Regulation**				11	.801
D	**Resource Management**	(a)	Environment Management	5	11	.766
		(b)	Effort Management	4		
		(c)	Help-Seeking	2		
					41	.930

Table 1 additionally indicates the survey's reliability. Cronbach analysis was performed on every variable. The Cronbach alpha for Cognitive components is .904, for Metacognitive components it is .801, and for Resource management, it is .766. The comprehensive assessment for all 41 items is .930. This indicates a strong reliability of the selected instrument. Additional analysis utilizing SPSS is conducted to showcase findings that address the research questions for this investigation.

RESULT AND DISCUSSION

Findings for Demographic Profile

Table 2 displays the demographic profile of students who took part in the survey. The data shows that 32% of the respondents are male, while 68% are female.

Table 2: Percentage for Q1-Gender

No	Item	Percentage
1	Male	32%
2	Female	68%

The table 3 above shows that the largest percentage of students is from Social Sciences (52%), followed closely by those taking Science and Technology (48%). Different age groups took part in this study. According to the data, the largest age group is 17 to 21 years old, comprising 65%, while the remaining 35% are from the 22 to 26 age group.

Table 3: Percentage for Q2-Discipline

No	Item	Percentage
1	Science & Technology	48%
2	Social Sciences	52%

Table 4: Percentage for Q3-Age Group

No	Item	Percentage
1	17-21	65%
2	22-26	35%
3	27 and above	0%

Table 5 shows the percentage distribution for the level of study. The table indicates that 13% are enrolled in Certificate/Diploma programs, while 87% are pursuing Degree programs.

Table 5: Percentage for Q4-Level of Study

No	Item	Percentage
1	Certificate /Diploma	13%
2	Degree	87%

Findings for Cognitive Components

This section provides information to address research question 1- How do students view the application of cognitive elements in their learning? In this study, this is assessed through (i) rehearsal, (ii) organization, (iii) elaboration, and (iv) critical thinking.

Table 6 illustrates the mean for the item "Rehearsal" in learning. It seems that learners find memorising keywords most useful (with a mean of 4.0, SD = .73733) to remind them of important concepts in class. This is followed by making lists of important items (with a mean of 3.9, SD = .82262). Whereas, the strategies of practicing saying the material to themselves over and over, as well as reading the class notes over and over both have a mean of 3.6 (SD = .85848 and SD = .77960 respectively).

Table 6: Mean for (i) Rehearsal (4 items)

Item	Mean	SD
LSCCRQ1 When I prepare for my classes, I repeatedly say the material to myself.	3.6	.85848
LSCCRQ2 While preparing for the courses, I repeatedly review my class notes and the assigned readings.	3.6	.77960
LSCCRQ3I remember key terms to help me recall essential ideas in this course.	4	.73733
LSCCRQ4I create lists key items for the classes and commit them to memory.	3.9	.82262

According to the organisation mean (3.9, SD =.73624), students believe that the most crucial aspect of studying is trying to identify the most significant concepts in the readings and class notes.

The next steps include creating an outline of key concepts (mean of 3.7, SD =.88870), outlining the content to assist organise one's thoughts (mean of 3.8, SD =.81857), and creating basic charts, diagrams, or tables to help organise course materials (mean of 3.3, SD = 1.01317).

Table 7: Mean for (ii) Organisation (4 items)

Item	Mean	SD
LSCCOQ1 In order to better arrange my thoughts, I make an overview of the readings for the program's courses as I study them.	3.8	.81857
LSCCOQ 2I try to identify the most crucial concepts in the readings and my class notes while I study for the classes.	3.9	.73624
LSCCOQ 3I create basic tables, charts, or diagrams to assist me in organising the course materials for this course.	3.3	1.01317
LSCCOQ 4I review my class notes and create an overview of key ideas while I study for the classes.	3.7	.88870

Table 8: Mean for (iii) Elaboration (6 items)

Item	Mean	SD
LSCCEQ1 I combine knowledge from several sources, including texts, lectures, and discussions, when I prepare for the classes in this program.	3.8	.86900
LSCCEQ2 I makes every effort to connect concepts from one course to those from other courses.	3.6	.92515
LSCCEQ3I make an effort to connect the readings for the classes to my prior knowledge.	4	.80184
LSCCEQ4 I create concise synopses of the key points from the readings and my class notes while I study for the courses in this program.	3.7	.90738
LSCCEQ5 By drawing connections between the readings and the ideas presented in the lectures, I aims to comprehend the content covered in class.	3.9	.77382
LSCCEQ6 In other class activities like lectures and discussions, I tries to incorporate concepts from the course texts.	3.8	.79571

Table 8 demonstrates the mean for the Elaboration method. The method of linking the material to past knowledge had the greatest mean (4.0, SD = 0.80184). This is followed by comprehending the information by drawing parallels between the readings and the concepts from the lectures (mean = 3.9, SD =.77382).

Following this, students attempt to apply ideas from course readings in other class activities such as lecture and discussion (mean = 3.8, SD =.79571), gather information from various sources, such as lectures, readings, and discussions (mean = 3.8, SD =.86900), and write summaries of the main ideas from the readings and class notes (mean = 3.7, SD=.90738).

Finally, learners attempt to connect ideas from one subject to those from other courses wherever possible (mean = 3.6, SD =.92515).

Table 9: Mean for (iv) Critical Thinking (5 items)

Item	Mean	SD
LSCCCTQ1I frequently find myself questioning what I hear or read in the cours es to see whether I find it persuasive.	3.8	.83572
LSCCCTQ2When a theory, interpretation, or conclusion is provided in class or in readings, I try to determine whether there is adequate supporting evidence.	3.7	.76928
LSCCCTQ3I use the course materials as a starting point and try to create my own opinions about them.	3.7	.78088
LSCCCTQ4I try to come up with my own ideas about what I'm learning in the classes.	3.7	.79818
LSCCCTQ5Whenever I read or hear an assertion or conclusion in class, I consi der possible alternatives.	3.7	.84254

Table 9 presents the means for critical thinking. The highest mean at 3.8 (SD = .83572) is reported for the item "I often find myself questioning things I hear or read in the courses to see whether I find it persuasive". The remaining 4 items obtained the second highest mean score of 3.7 for " When a theor, interpretation, or conclusion is provided in class or in readings, I try to determine whether there is adequate supporting evidence"(SD=.76928),I use the course materials as a starting point and try to create my own opinions about them." (SD = .78088), "I try to come up with my own ideas about what I'm learning in the classes." (SD = .79818) and "Whenever I read or hear an assertion or conclusion in the classes, I consider possible alternatives" (SD = .84254).

Findings for Metacognitive Self-Regulation

This section presents data to answer research question 2- How do learners perceive the use of metacognitive self-regulation in their learning?

Table 10: Mean for Metacognitive Self-Regulation

Item	Mean	SD
MSSRQ1 During class time, I often miss important points because I am thinking of other things.	3.2	1.00307
MSSRQ2 When reading for the courses, I make up questions to help focus my reading.	3.4	.86754
MSSRQ3 When I become confused about something I am reading for the classes, I go back and try to figure it out.	3.8	.76759
MSSRQ4 If course readings are difficult to understand, I change the way I read the material.	3.8	.77123
MSSRQ5 Before I study new course material thoroughly, I often skim it to see how it is organized	3.6	.90857
MSSRQ6 I ask myself questions to make sure I understand the material I have been studying in this program.	3.7	.89273
MSSRQ7 I try to change the way I study to fit any course requirements and the instructors' teaching style.	3.7	.80218
MSSRQ8 I try to think through a topic and decide what I am supposed to learn from it rather than just reading it over when studying for the courses in this program.	3.6	.83775
MSSRQ9 When studying for the courses in this program I try to determine which concepts I do not understand well.	3.8	.75606

MSSRQ10 When I study for the courses, I set goals for myself to direct my activities in each study period.	3.7	.84919
MSSRQ11 If I get confused taking notes in classes, I make sure I sort it out afterwards.	3.7	.96601

Table 10 highlights the mean for metacognitive self-regulation. The highest mean at 3.8 is obtained for 3 items, “When I become confused about something I am reading for the classes, I go back and try to figure it out” (SD = .76759), “If course readings are difficult to understand, I change the way I read the material” (SD = .77123) and “When studying for the courses in this program I try to determine which concepts I do not understand well” (SD = .75606). The second highest mean at 3.7 is for 4 items, “I ask myself questions to make sure I understand the material I have been studying in this program” (SD = .89273), “I try to change the way I study to fit any course requirements and the instructors’ teaching style” (SD = .80218), “When I study for the courses, I set goals for myself to direct my activities in each study period” (SD = .84919), and “If I get confused taking notes in classes, I make sure I sort it out afterward” (SD = .96601). The third highest mean is 3.6 for the items “Before I study new course material thoroughly, I often skim it to see how it is organised” (SD = .90857) and “I try to think through a topic and decide what I am supposed to learn from it rather than just reading it over when studying for the courses in this program” (SD = .83775).

Findings for Resource Management

This section presents data to answer research question 3- How do learners view the application of resource management in their education? In the context of this study, this is measured by (i) environment management, (ii) effort management and (iii) help-seeking.

Table 11: Mean for (i) Environment Management (5 items)

Item	Mean	SD
RMCEMQ1 I normally study in a location where I can focus on my coursework.	4.2	.80752
RMCEMQ 2 I make effective use of my study time for this program's courses.	3.9	.73986
RMCEMQ3 I have a regular place space set aside for studying	3.8	.91429
RMCEMQ4 I ensure that I complete weekly readings and homework for the courses.	3.7	.78925
RMCEMQ5 I routinely attend classes in this program.	4.5	.70193

Table 11 presents the mean scores for five items related to Environment Management, listed from highest to lowest. The highest mean score of 4.5 (SD = .70193) is for "I routinely attend the classes in this program," followed by 4.2 (SD = .80752) for "I normally study in a location where I can focus on my coursework." The mean score for "I make effective use of my study time for this program’s courses" is 3.9 (SD = .73986), while "I have a regular place space set aside for studying" has a score of 3.8 (SD = .91429). The lowest mean score, 3.7 (SD = .78925), is for "I ensure that I complete weekly readings and homework for the courses."

Table 12: Mean for (ii) Effort Management (4 items)

Item	Mean	SD
RMCEMQ1 I have a regular place set aside for studying	3.8	.82186
RMCEMQ 2 Even though I dislike what we are doing, I put a lot of effort into achieving well in the classes in this program.	4	.76642

RMCEMQ 3 When coursework is difficult, I either give up or only study the easy parts.	2.9	1.09094
RMCEMQ 4 I can continue working until I finish, even when the course materials are uninteresting.	3.9	.73281

Table 12 shows the mean scores for four items related to Effort Management, listed from highest to lowest. The highest mean score of 4.0 (SD = .76642) is for "I work hard to do well in the classes in this program even if I do not like what we are doing." This is followed by "I am able to continue working until I finish, even when the course materials are boring and uninteresting.", with a mean score of 3.9 (SD = .73281). "I have a regular place set aside for studying" has a mean score of 3.8 (SD = .82186), and the lowest mean score of 2.9 (SD = 1.09094) is for "When coursework is difficult, I either give up or only study the easy parts."

Table 13: Mean for (iii) Help-Seeking (2 items)

Item	**Mean**	**SD**
RMCHSQ1When I cannot understand the material in a course, I ask another student in the class for help.	4.2	.81751
RMCHSQ 2I try to identify students in the classes whom I can ask for help if necessary.	4.2	.88836

Table 13 shows the mean scores for two items related to Help-Seeking, both with a mean score of 4.2. The items are: "When I cannot understand the material in a course, I ask another student in the class for help" (SD = .81751) and "I try to identify students in the classes whom I can ask for help if necessary" (SD = .88836).

Findings for the Relationship between all learning strategies

This section presents data to answer research question 4- Is there a relationship between all learning strategies?

Table 14: Correlation between Cognitive Components and Metacognitive Self-Regulation

Correlations			
		COGNITIVE	**METACOGNITIVE**
COGNITIVE	Pearson Correlation	1	.718**
	Sig. (2-tailed)		.000
	N	142	142
METACOGNITIVE	Pearson Correlation	.718**	1
	Sig. (2-tailed)	.000	
	N	142	142

**. Correlation is significant at the 0.01 level (2-tailed)

The relationship between cognitive and metacognitive self-regulation is illustrated in Table 14. With a p-value of.000, correlation analysis reveals a highly significant link between cognitive and metacognitive self-regulation (r=.718**). According to Jackson (2015), positive correlations are assessed on a scale of 0.1 to 1.0, and a coefficient is considered significant at the.05 level.

A moderate positive correlation is between 0.3 and 0.5, a strong positive correlation falls between 0.5 and 1.0, while a weak positive correlation falls between 0.1 and 0.3. This implies that cognitive and metacognitive self-regulation have a strong positive association.

Table 15: Correlation between Metacognitive Self-Regulation and Resource Management

Correlations			
		METACOGNITIVE	**RESOURCE management**
METACOGNITIVE	Pearson Correlation	1	.549**
	Sig. (2-tailed)		.000
	N	142	142
RESOURCE management	Pearson Correlation	.549**	1
	Sig. (2-tailed)	.000	
	N	142	142

Table 15 suggests that resource management and metacognitive self-regulation are related. A correlation coefficient of r=.549** and p=.000 indicate a highly significant relationship between resource management and metacognitive self-regulation, according to the correlation analysis results. According to Jackson (2015), correlations range from 0.1 to 1.0, and a coefficient is considered significant at the.05 level. A weak positive correlation is defined as falling between 0.1 and 0.3, a moderate positive correlation ranges from 0.3 to 0.5, and a strong positive correlation is identified as anything from 0.5 to 1.0. Therefore, this indicates a strong positive relationship exists between metacognitive self-regulation and resource management.

Table 16: Correlation between Resource Management and Cognitive Components

Correlations			
		RESOURCE management	**COGNITIVE**
RESOURCE management	Pearson Correlation	1	.612**
	Sig. (2-tailed)		.000
	N	142	142
COGNITIVE	Pearson Correlation	.612**	1
	Sig. (2-tailed)	.000	
	N	142	142

There is a correlation between cognitive components and resource management, as seen in Table 16. With a p-value of.000, the correlation analysis shows a strong significant relationship between cognitive components and resource management (r=.612**). Positive correlations are calculated on a scale from 0.1 to 1.0, and a coefficient is deemed significant at the.05 level (Jackson, 2015). Between 0.1 and 0.3 is a weak positive correlation, between 0.3 and 0.5 is a moderate positive correlation, and between 0.5 and 1.0 is a strong positive correlation. Therefore, it can be said that resource management and cognitive components are strongly positively correlated.

The findings of this study confirm the multifaceted nature of language learning strategies and their interrelated influence on academic performance. The strong positive correlations identified among cognitive components, metacognitive self-regulation, and resource management suggest that effective language learners do not rely on a single strategy, but rather engage in an integrative use of diverse approaches. This reinforces the argument made by Oxford (1990) and Wenden and Rubin (1987) that strategic behaviors in language learning must be viewed as interconnected dimensions rather than isolated constructs.

Firstly, the use of cognitive strategies such as rehearsal, elaboration, organization, and critical thinking is notably prevalent among participants. The high mean scores associated with elaboration strategies—especially in connecting new material with prior knowledge demonstrate learners' efforts to make meaningful associations during the learning process. This aligns with Craik and Lockhart's (1972) levels-of-processing framework, which posits that deeper cognitive engagement leads to better retention and understanding. Moreover, the inclination toward critical thinking reflects students' ability to evaluate content rather than passively absorb it, which is consistent with Halpern's (1998) emphasis on the importance of critical thinking across academic domains.

Secondly, metacognitive self-regulation emerged as a critical factor enabling students to monitor, adapt, and reflect on their learning strategies. High mean scores in items related to adaptive reading techniques and self-questioning support the notion that students actively assess their comprehension and adjust their strategies accordingly. These findings resonate with the works of Zimmerman (2000) and Schraw and Moshman (1995), who advocate for self-regulation as a key determinant of academic achievement. The ability to identify areas of confusion and seek clarification is indicative of well-developed procedural and conditional knowledge, which are central to metacognitive awareness.

Thirdly, resource management was found to be a significant pillar of successful language learning, particularly in areas related to environmental control, effort management, and peer support. Students' strong agreement with items on class attendance, setting aside dedicated study spaces, and peer help-seeking behavior reflects a mature approach to learning that goes beyond mere time-on-task. This supports Pintrich's (2004) framework on self-regulated learning, wherein both internal (effort, motivation) and external (study environment, support systems) resources must be effectively orchestrated to optimize learning outcomes.

The statistical analyses further affirm the interdependence of these three domains. The strongest correlation observed between cognitive strategies and metacognitive self-regulation ($r = .718^{**}$) illustrates that learners who actively engage in processing information are also likely to monitor and regulate their learning. Likewise, the significant correlations between resource management and both cognitive strategies ($r = .612^{**}$) and metacognitive self-regulation ($r = .549^{**}$) underscore the supportive role of external and internal resource allocation in the broader strategic learning ecosystem. These findings are consistent with previous studies such as those by Nur Natasha Eliana et al. (2024), which emphasized the synergy among cognitive, metacognitive, and resource-based strategies in effective learning.

While the findings are generally positive, they also highlight some areas for pedagogical improvement. For instance, despite moderate to high means across all subdomains, the comparatively lower scores in effort management, particularly the item concerning perseverance in the face of difficulty, suggesting that not all students are equally equipped to persist through academic challenges. This finding resonates with the broader concerns about students' overreliance on surface learning methods such as rote memorization (Yusof et al., 2020), indicating a need for targeted interventions that foster resilience and intrinsic motivation.

In sum, this study contributes to the existing literature by empirically validating the integrated model of learning strategies proposed by Wenden and Rubin (1987), while also offering context-specific insights into Malaysian higher education. It reinforces the imperative for educators to nurture students' metacognitive awareness, encourage active cognitive engagement, and facilitate effective resource use through institutional support and instructional scaffolding. Ultimately, understanding how these strategies interact provides a foundation

for designing curriculum and pedagogical practices that are not only effective but also responsive to learners' diverse needs in a globalized academic landscape.

CONCLUSION

In conclusion, the study highlights the essential role of cognitive, metacognitive, and resource management strategies in shaping learners' academic success. By employing diverse cognitive strategies such as rehearsal, organization, elaboration, and critical thinking, students enhance their comprehension and retention of information. Additionally, metacognitive self-regulation fosters adaptive learning through self-monitoring, goal-setting, and strategic study adjustments.

Resource management further supports learning by optimizing study environments, maintaining perseverance, and seeking collaborative assistance. The strong positive relationships among these strategies reinforce the interconnected nature of effective learning, emphasizing that a well-rounded approach combining cognitive engagement, self-regulation, and resource utilization is crucial for academic achievement. These findings align with established theories, offering valuable insights into how learners can optimize their study habits for deeper understanding and long-term success.

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