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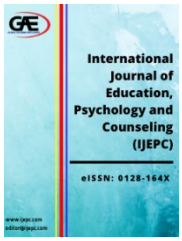

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THE INFLUENCE OF RESOURCE MANAGEMENT ON LEARNING STRATEGIES AMONG UNDERGRADUATES

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Abstract:

This study examines how undergraduate students use learning strategies with a particular focus on resource management, cognitive, and metacognitive techniques. It explores students' perceptions of these strategies and their impact on learning. The study employs a quantitative survey methodology using a 5-point Likert scale instrument consisting of 41 items across four sections. Data were collected from 318 undergraduate students. The results were analyzed with SPSS to present findings that address the research questions of this study. The findings indicate that students' cognitive strategies focus on memorization and organization of information, prioritizing mental and written methods instead of verbal or visual approaches. Although they practice critical thinking, their approach focuses more on linking new information to prior knowledge and assessing validity, rather than generating original concepts or thoroughly examining evidence. Students perceive their metacognitive strategies as a means of actively monitoring and regulating comprehension, mainly by recognizing and addressing points of confusion. They effectively apply self-monitoring and adaptive learning strategies but are less inclined to engage proactively in pre-reading strategies, such as formulating questions. The minimal in-class distractions indicate that they see themselves as attentive

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learners. The results also suggest that students manage their learning effectively by controlling their environment and effort, demonstrating resilience and a strong degree of persistence, even when facing challenging or less engaging content. They actively seek assistance, mainly from peers, when they face challenges. Although they typically handle their study environment effectively, there is a small inconsistency in completing all weekly tasks. The findings indicate a notable connection between resource management and their cognitive approaches, as well as metacognitive regulation. This suggests that efficient resource management is a crucial element related to a learner's application of both fundamental study methods and advanced self-regulation skills.

Keywords:
Learning Strategies, Resource Management, Cognitive, Metacognitive, Quantitative Survey

Introduction

Background of Study

Suitable learning techniques greatly influence students' academic success. A learning strategy refers to a method or ability employed by an individual to achieve a positive outcome. Comprehending learning strategies is crucial for allowing students to appreciate the learning process and for teachers to facilitate learning more efficiently. There are three primary types of self-regulated learning, which are cognitive, metacognitive, and resource management strategies (Mohammed Raffi et al., 2023). The cognitive component refers to the mental processes of knowing, understanding, and learning. It involves functions such as paying attention, memory, comprehension, problem-solving, and critical thinking. Meanwhile, metacognitive self-regulation includes the ability of students to plan, monitor, evaluate their progress, and adjust learning strategies when necessary. Resource management includes time management, study environment, seeking help, and using learning materials. It is believed that the use of effective learning strategies is an important factor in achieving academic success, and students may require a variety of strategies to control their learning (Mohamed Adnan, Nordin & Ibrahim, 2018). This research will examine how much undergraduate students engage when responding to questions about cognitive components, metacognitive self-regulation, and resource management as learning strategies.

Statement of Problem

In personalised learning, metacognitive awareness is crucial, as it enables students to plan, evaluate, and define more specific goals for their learning activities. Students with metacognitive awareness can effectively plan, sequence, and track their learning (Ackermans et al., 2024). Meanwhile, self-regulation of motivation refers to keeping an eye on one's motivation level or state and taking action to activate, sustain, or enhance it, including overcoming obstacles and failures (Villar et al., 2024). Resource management is one of the three primary learning strategies within self-regulated learning (SRL). It reflects the growing necessity of managing and controlling resources (including time, energy, the learning environment, and outside help) during the learning process. This strategy encompasses the behavioural and environmental components of SRL strategies, including effort regulation (the capacity to persevere in the face of learning), peer learning (the practice of working with peers

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or other students to support the learning process), time and study environment management (the capacity to manage one's own learning time and tasks), and help-seeking (the practice of asking for assistance from peers or teachers or consulting outside resources. (Zhao et al., 2024). Resource management strategies were the least studied learning strategies among SRL approaches, as mentioned by Zhao et al. (2024). Research conducted by Bickerdike (2016) found that students exhibit varied learning strategies. This journal article will report on a survey of undergraduate students' perceptions regarding the use of cognitive components, resource management, and metacognitive self-regulation as learning strategies.

Research Objective and Research Questions

This study is done to explore the perception of learners on their use of learning strategies. Specifically, this study is done to answer the following questions;

- How do learners perceive their use of cognitive components as their learning strategy?
- How do learners perceive their use of metacognitive self-regulation as their learning strategy?
- How do learners perceive their use of resource management as their learning strategy?
- Is there a relationship between resource management and other components in learning strategies?

Literature Review

Theoretical Framework

Learning Strategies

Karpicke & O'Day (2024) identify six learning processes, including elaborative inquiry, teaching and explaining, retrieval practice, spaced practice, interleaved practice, and repetitive reading. These tactics can be separated into three categories, which are metacognitive (teaching and explaining), cognitive (repeated reading, retrieval practice, and elaborative inquiry), and resource management (spaced and interleaved practice). The first strategy is reading repeatedly, a cognitive approach. Although students often read while preparing for an exam, research indicates that merely reading the same content repeatedly is not an effective learning strategy. Teaching and explaining, classified as a metacognitive strategy, is typically ineffective for students unless specifically encouraged, despite compelling evidence of its effectiveness. The following two techniques could be classified as cognitive techniques, which are retrieval practice and in-depth questioning. Instructors can use these techniques in the classroom, and students can use them when studying alone. Cross-training and spaced practice are categorised as resource management techniques. Students make decisions about when, where, and how they study, and research indicates that these choices have a significant impact on learning.

Rincon-Flores et al. (2024) also discussed a similar concept, stating that a customized and effective learning experience can be achieved through the integration of cognitive, metacognitive, and resource management strategies in adaptive learning. Cognitive strategies involve adjusting the learning pace and content to align with each learner's cognitive style and aptitude. An article by Rincon-Flores et al. examines how adaptive learning (AL) systems can

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support various cognitive functions, from reviewing information through digital materials (videos, reading) to engaging in advanced cognitive activities such as problem solving. They explicitly emphasise the importance of tailoring activities to students' needs. Metacognitive strategies encourage learners to reflect on their learning process, identify difficulties, and adjust their approaches accordingly. The article highlights the significance of self-regulated learning, a fundamental element of metacognition, which entails monitoring and controlling one's learning, including assessing the surroundings and adjusting accordingly. The system also promotes student reflection and self-awareness by creating structured chances for inquiry in the classroom. Resource management strategies, on the other hand, focus on providing students with the necessary support and resources to optimize their learning, such as prompt feedback, access to relevant information, and opportunities for collaboration. The AL system is designed on a "didactic model" that incorporates diverse digital tools, automated-response exercises, and chances for engagement with instructors and peers. This directly tackles the necessity of enhancing the educational environment and offering adequate support.

Zubbir et al. (2023) examined the language acquisition techniques of 144 undergraduate students studying Japanese at a Malaysian University, based on Bandura's Reciprocal Determinism theory. The study employed a quantitative survey to assess the interaction among students' behaviour, personal traits, and environment. Results indicated that students often utilize behavioural techniques such as repetition and have favourable views of their metacognitive self-regulation usage. The research also identified a connection between a supportive educational atmosphere and increased effort and help-seeking behaviour. The findings indicate that both learners and teachers can benefit from comprehending these connections to improve language acquisition, highlighting the need for future studies to develop a teaching framework rooted in these insights.

The study investigates how students apply cognitive learning strategies, resource management, and metacognitive self-regulation. It explores whether students use effective techniques such as organization, elaboration, and critical thinking (explaining, retrieval practice) or rely primarily on rehearsal (repetitive reading). Metacognitive self-regulation is evaluated by assessing how students monitor and adjust their learning progress. In the area of resource management, the study explores how students manage their study environment, effort, and help-seeking behaviours. It also identifies barriers to the use of effective strategies, such as time constraints, motivation issues, and limited access to resources. The findings can help enhance learning by promoting better study guidance, targeted metacognitive training, and enhanced access to effective learning resources.

Past Studies

Past Studies on Strategies in Learning

A study by Khawwaf et al. (2024) examines the factors influencing academic motivation among university students, focusing on learning strategies, academic achievement, self-efficacy, self-esteem, and self-regulation. It also explores the impact of psychological capital and gender on these relationships. Based on the understanding that academic success is largely driven by student motivation, it is shaped by a combination of psychological, strategic, and regulatory factors. The study adopted a quantitative, cross-sectional survey design. Data were collected from 300 students at the University of Dhi Qar, Iraq, and analyzed using Pearson correlation, stepwise regression, and structural equation modeling. Findings indicated that

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learning strategies, academic achievement, self-efficacy, self-esteem, and self-regulation significantly influence academic motivation.

Zhao et al. (2024) investigated whether mobile sensing could be used to evaluate university students' resource management and self-regulated learning (SRL) practices. The study involved 211 students from a Chinese university, who participated over the course of one year. Participants were recruited and provided with the iSense app, a mobile sensing application on their smartphones. They were required to complete weekly self-report surveys using subscales of the Motivated Strategies for Learning Questionnaire (MSLQ). Meanwhile, the app monitored various behavioural indicators, such as their physical activities, sleep patterns, semantic locations, application usage, and overall smartphone usage. The survey responses were then compared with the data collected by the app. The study concluded that mobile sensing can effectively assess resource management and SRL strategies. The researchers suggested that this approach could be used to develop personalized interventions to enhance students' SRL skills.

Another study by Heo, Bonk & Doo (2022) examined the structural relationships between learning engagement, resource management, and self-efficacy during the COVID-19 pandemic. It also explored whether depression levels moderated these relationships by comparing students with no depression to those experiencing moderate to severe depression. The results revealed that resource management influenced learning engagement, regardless of depression levels. Furthermore, self-efficacy played a crucial role in shaping resource management. The authors concluded that fostering self-efficacy is essential for effective resource management in learning.

Self-regulated learning (SRL) and resource management are crucial to academic success, as highlighted by all three studies. A recurring key factor is self-efficacy, which not only directly influences learning motivation and engagement but also serves as a foundation for effective resource management (Heo, Bonk & Doo, 2022). Students with strong self-belief are more likely to adopt and sustain effective learning strategies. These findings have practical implications for educators and institutions, emphasizing the importance of teaching resource management skills, fostering self-efficacy, and considering individual student differences when designing learning environments and interventions.

Conceptual Framework

Learners depend on the use of learning strategies to enhance their learning success. Rahmat (2023) noted that that learners strategically select and apply different strategies at different stages of the learning process to maximise outcomes. As mentioned by Wenden and Rubin (1987), learners use strategies such as resource management, cognitive components, and metacognitive self-regulation to maximize their learning. This study (Figure 1) explores the relationship between resource management and cognitive components in learning. It also investigates the relationship between resource management and metacognitive self-regulation, as well as cognitive components and metacognitive self-regulation.

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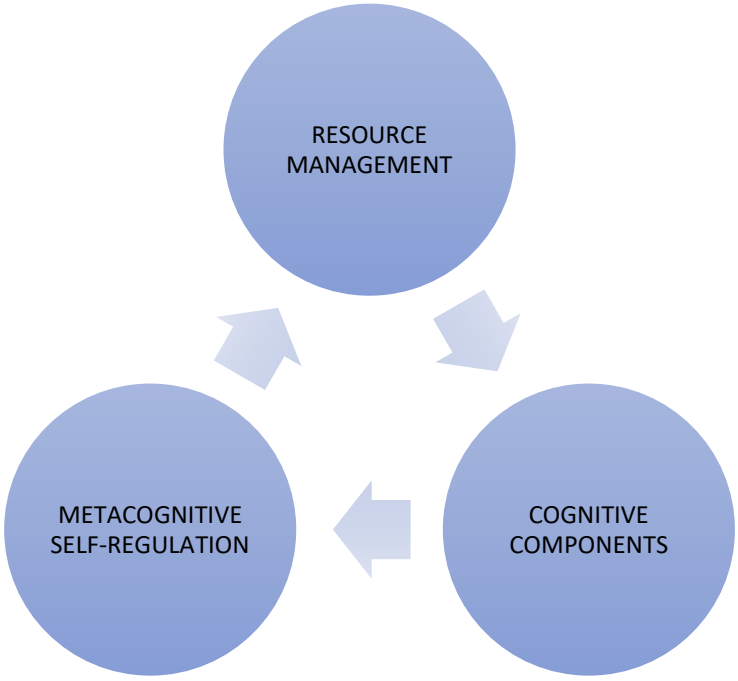

Figure 1- Conceptual Framework of the Study-
The Influence of Resource Management on Learning Strategies.

Methodology

This quantitative study is done to explore the motivation factors for learning among undergraduates. A purposive sample of 318 participants completed a survey based on a five-point Likert-scale survey and is referred to as Wenden and Rubin (1987) to measure the variables in Table 1 below. The survey consisted of four sections, which are Section A (Demographic Profile), Section B (Cognitive Components), Section C (Metacognitive Self-regulation), and Section D (Resource Management). There were 44 items altogether for each survey, where 3 items were in Section A, 19 items in Section B, 11 items in Section C, and 11 items in Section D.

Table 1: Distribution of Items in the Survey

Sect	STRATEGY		SUB-STRATEGY	Item	Tot Items	Cronbach Alpha
B	COGNITIVE COMPONENTS	(a)	Rehearsal	4	19	.918
		(b)	Organization	4		
		(c)	Elaboration	6		
		(d)	Critical Thinking	5		
C	METACOGNITIVE SELF-REGULATION				11	.845

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D	RESOURCE MANAGEMENT	(a)	Environment Management	5	11	.829
		(b)	Effort Management	4		
		(c)	Help-Seeking	2		
					41	.947

Table 1 presents the reliability results of the survey instrument. The analysis shows a Cronbach's Alpha of .918 for cognitive components, .845 for metacognitive self-regulation and .829 for resource management. The overall coefficient reliability for all 41 items is .947, indicating a good reliability of the instrument used. Data were further analysed using the Statistical Package for the Social Sciences (SPSS) to present findings to answer the research questions for this study.

Findings

Findings for Demographic Profile

This section contains three items which are (i) Gender, (ii) Discipline and (iii) Level. The data were tabulated and shown separately in the Table 2, 3 and 4 below.

Table 2: Percentage for Q1 Gender

1	Male	43%
2	Female	57%

Table 2 shows that female participants contribute 57%, while male participants only contribute 43% to the questionnaire.

Table 3: Percentage for Q2 Discipline

1	**Science & Technology**	**55%**
2	**Social Sciences**	**45%**

Based on Table 3, 55% of participants were from the Science & Technology discipline, and 45% of participants were from the Social Sciences discipline.

Table 4: Percentage for Q3 Level

1	**Diploma**	**33%**
2	**Degree**	**67%**

From Table 4, 67% the participants were from the degree level, while 33% respondents were from the diploma level.

Findings for Cognitive Components

This section presents data to answer research question 1: How do learners perceive their use of cognitive components as their learning strategy? Cognitive components are measured by (i) rehearsal, (ii) organization, (iii) elaboration and (iv) critical thinking.

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Table 5: Mean for (i) Rehearsal

Item	Mean	SD
LSCCRQ1 When I study for the classes, I practice saying the material to myself over and over.	3.5	.85755
LSCCRQ2 When studying for the courses, I read my class notes and the course readings over and over again.	3.8	.83839
LSCCRQ3 I memorize key words to remind me of important concepts in this class.	4.4	.80704
LSCCRQ4 I make lists of important items for the courses and memorize the lists.	4	.84979

Table 5 presents the mean score for Rehearsal. The item with the highest mean score of 4.4 (SD=.80704) is "*I memorize key words to remind me of important concepts in this class*", followed by item "*I make lists of important items for the courses and memorize the lists*" with a mean score of 4.84979. Next, the item with a mean score of 3.8 is "*When studying for the courses, I read my class notes and the course readings over and over again*". The item with the lowest mean score of 3.5 (SD=.85755) is "*When I study for the classes, I practice saying the material to myself over and over*".

Table 6: Mean for (ii) Organization

Item	Mean	SD
LSCCOQ1 When I study the readings for the courses in the program, I outline the material to help me organize my thoughts.	3.8	.90626
LSCCOQ2 When I study for the courses, I go through the readings and my class notes and try to find the most important ideas.	4	.82340
LSCCOQ3 I make simple charts, diagrams, or tables to help me organize course materials in this program.	3.3	1.04818
LSCCOQ4 When I study for the courses, I go over my class notes and make an outline of important concepts.	3.8	.86183

Table 6 presents the mean scores for Organization, which consists of four items. The item with the highest mean of 4.0 (SD=.82340) is *"When I study for the courses, I go through the readings and my class notes and try to find the most important ideas"*. The item *"When I study for the courses, I go over my class notes and make an outline of important concepts"* and *"When I study the readings for the courses in the program, I outline the material to help me organize my thoughts"* share the same mean score of 3.8 (SD=.86183), representing the second highest mean. The lowest mean score of 3.3 (SD=1.04818) is obtained by the *item "I make simple charts, diagrams, or tables to help me organize course materials in this program"*.

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Table 7: Mean for (iii) Elaboration

Item	Mean	SD
LSCCEQ1 When I study for the courses in this program, I pull together information from different sources, such as lectures, readings, and discussions.	3.7	.88495
LSCCEQ2 I try to relate ideas in one subject to those in other courses whenever possible	3.8	.90954
LSCCEQ3 When reading for the courses, I try to relate the material to what I already know.	3.9	.81317
LSCCEQ4 When I study for the courses in this program, I write brief summaries of the main ideas from the readings and my class notes.	3.5	.96775
LSCCEQ5 I try to understand the material in the classes by making connections between the readings and the concepts from the lectures.	3.8	.83638
LSCCEQ6 I try to apply ideas from course readings in other class activities such as lecture and discussion.	3.7	.807044

Table 7 shows the mean scores for Elaboration, which consists of six items, with mean values ranging from 3.5 to 3.9. The item *"When reading for the courses, I try to relate the material to what I already know"* has the highest mean score of 3.9 (SD=.81317). Two items share the second highest mean of 3.8, which *are "I try to relate ideas in one subject to those in other courses whenever possible"* and *"I try to understand the material in the classes by making connections between the readings and the concepts from the lectures"*. The *items "When I study for the courses in this program, I pull together information from different sources, such as lectures, readings, and discussions"* and *" I try to apply ideas from course readings in other class activities such as lecture and discussion"* share the third highest mean of 3.7 (SD=.807044). The item with the lowest mean score of 3.5 (SD=.96775) is *"When I study for the courses in this program, I write brief summaries of the main ideas from the readings and my class notes"*.

Table 8: Mean for (iv) Critical Thinking

Item	Mean	SD
LSCCCTQ1 I often find myself questioning things I hear or read in the courses to decide if I find them convincing.	3.7	.85950
LSCCCTQ2 When a theory, interpretation, or conclusion is presented in classes or in the readings, I try to decide if there is good supporting evidence.	3.5	.87967
LSCCCTQ3 I treat the course materials as a starting point and try to develop my own ideas about it.	3.5	.86187
LSCCCTQ4 I try to play around with ideas of my own related to what I am learning in the courses.	3.6	.81710
LSCCCTQ5 Whenever I read or hear an assertion or conclusion in the classes, I think about possible alternatives.	3.6	.89049

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Table 8 presents the mean scores for Critical Thinking, with values ranging from 3.5 to 3.7. The item with the highest mean score of 3.7 (SD= 0.85950) is "I often find myself questioning things I hear or read in the courses to decide if I find them convincing.". Two items share the second highest mean score of 3.6 (SD=.81710 & SD=.89049), namely *"I try to play around with ideas of my own related to what I am learning in the courses"* and *"Whenever I read or hear an assertion or conclusion in the classes, I think about possible alternatives"*. The lowest mean score of 3.5 (SD=.861710) is recorded by two items, which are *"I treat the course materials as a starting point and try to develop my own ideas about it"* and *"When a theory, interpretation, or conclusion is presented in classes or in the readings, I try to decide if there is good supporting evidence"*.

Findings for Metacognitive Self-Regulation

This section presents data to answer research question 3: How do learners perceive their use of resource management as their learning strategy? This is measured by (i) environment management, (ii) effort management, and (iii) help-seeking.

Table 9: 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	.94893
MSSRQ 2 When reading for the courses, I make up questions to help focus my reading.	3.4	.97742
MSSRQ 3 When I become confused about something I am reading for the classes, I go back and try to figure it out.	3.8	.84792
MSSRQ 4 If course readings are difficult to understand, I change the way I read the material.	3.7	.89746
MSSRQ 5 Before I study new course material thoroughly, I often skim it to see how it is organized	3.5	.92502
MSSRQ 6 I ask myself questions to make sure I understand the material I have been studying in this program.	3.7	.86946
MSSRQ7 I try to change the way I study in order to fit any course requirements and the instructors' teaching style.	3.6	.90925
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	.85484
MSSRQ 9 When studying for the courses in this program I try to determine which concepts I do not understand well.	3.8	.81256
MSSRQ 10 When I study for the courses, I set goals for myself in order to direct my activities in each study period.	3.7	.91651
MSSRQ 11 If I get confused taking notes in classes, I make sure I sort it out afterwards.	3.7	.89127

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Table 9 shows the mean scores for Metacognitive Self-Regulation, with values ranging from 3.2 to 3.8 for 11 items. The highest mean score of 3.8 (SD=.84792 & SD= .81256) is recorded by two items, which are *"When I become confused about something I am reading for the classes, I go back and try to figure it out"* and *"When studying for the courses in this program I try to determine which concepts I do not understand well"*. The second highest mean at 3.7(SD=.89746, SD=.86946, SD=.91651 & SD=.89127) is shared by four items, namely *"If course readings are difficult to understand" , I change the way I read the material" , " I ask myself questions to make sure I understand the material I have been studying in this program", "When I study for the courses, I set goals for myself in order to direct my activities in each study period"* and *"If I get confused taking notes in classes, I make sure I sort it out afterwards"*. The third highest mean of 3.6 (SD=.90925 & SD=.85484) is obtained by item *"I try to change the way I study in order to fit any course requirements and the instructors' teaching style"* 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"*. The item *"Before I study new course material thoroughly, I often skim it to see how it is organized"* scored 3.5 (SD=.92502), followed by *"When reading for the courses, I make up questions to help focus my reading"* scored 3.4 (SD=.97742). The lowest mean score of 3.2 is recorded by the item *"During class time, I often miss important points because I am thinking of other things"*.

Table 10: Mean for (i) Environment Management (5 items)

Item	Mean	SD
RMCEMQ1 I usually study in a place where I can concentrate on my course work.	4	.86461
RMCEMQ 2 I make good use of my study time for the courses in this program.	3.7	.83877
RMCEMQ3 I have a regular place set aside for studying	3.7	.92173
RMCEMQ 4 I make sure that I keep up with the weekly readings and assignments for the courses.	3.5	.88977
RMCEMQ 5 I attend the classes regularly in this program.	4.4	.81869

Table 10 presents the mean scores for Environment Management across five items. The highest mean score of 4.4 (SD = 0.86461) is recorded for the fifth statement, *"I attend the classes regularly in this program."* The first statement, *"I usually study in a place where I can concentrate on my course work."* obtained the second highest score of 4. Meanwhile, the second, *"I make good use of my study time for the courses in this program."* and the third statement, *"I have a regular place set aside for studying",* both scored 3.7 (SD=.83877 & SD=.92173). The lowest mean score is 3.5 (SD=.88977), which refers to the statement *"I make sure that I keep up with the weekly readings and assignments for the courses"*.

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Table 11: Mean for (ii) Effort Management (4 items)

Item	Mean	SD
RMCEMQ1 I have a regular place set aside for studying	3.7	.92858
RMCEMQ 2 I work hard to do well in the classes in this program even if I do not like what we are doing.	3.8	.85084
RMCEMQ 3 When coursework is difficult, I either give up or only study the easy parts.	3.1	1.07250
RMCEMQ 4 Even when course materials are dull and uninteresting, I manage to keep working until I finish.	3.8	.84532

Table 11 displays the mean scores for Effort Management, comprising four items. The highest mean score of 3.8 (SD=.85084 & SD=.84532) is shared by the items *"I work hard to do well in the classes in this program even if I do not like what we are doing"* and *"Even when course materials are dull and uninteresting, I manage to keep working until I finish."*. this is followed by item *"I have a regular place set aside for studying"*, which recorded a mean score of 3.7 (SD=.92858). The item *"When coursework is difficult, I either give up or only study the easy parts"* achieved the lowest mean score of 3.1 (SD=1.07250).

Table 12: Mean for (iii) Help-Seeking

Item	Mean	SD
RMCHSQ1When I cannot understand the material in a course, I ask another student in the class for help.	4.2	.79208
RMCHSQ 2 I try to identify students in the classes whom I can ask for help if necessary.	4.1	.86995

Table 12 presents the mean score for Help-Seeking, which consists of two items. The item *"When I cannot understand the material in a course, I ask another student in the class for help"* recorded the highest mean score of 4.2 (SD=.79208). Meanwhile, the *item "I try to identify students in the classes whom I can ask for help if necessary"* recorded the lowest mean score of 4.1(SD=.866995).

Findings For Relationship Between The Learning Strategies.

This section presents data to answer research question 4: Is there a relationship between resource management and other components in learning strategies?

To determine if there is a significant association in the mean scores between resource management and other components in learning strategies, data is analysed using SPSS for correlations. Results are presented separately in Tables 13, 14, 15, and 16 below.

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Table 13: Correlation between Resource Management and Cognitive Components

Correlations

		RESOURCE_MANAGEMENT	COGNITIVE
RESOURCE_MANAGEMENT	Pearson Correlation	1	.692**
	Sig. (2-tailed)		.000
	N	318	318
COGNITIVE	Pearson Correlation	.692**	1
	Sig. (2-tailed)	.000	
	N	318	318

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

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

Correlations

		COGNITIVE	METACOGNITIVE
COGNITIVE	Pearson Correlation	1	.735**
	Sig. (2-tailed)		.000
	N	318	318
METACOGNITIVE	Pearson Correlation	.735**	1
	Sig. (2-tailed)	.000	
	N	318	318

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

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

Correlations

		METACOGNITIVE	RESOURCE_MANAGEMENT
METACOGNITIVE	Pearson Correlation	1	.725**
	Sig. (2-tailed)		.000
	N	318	318
RESOURCE_MANAGEMENT	Pearson Correlation	.725**	1
	Sig. (2-tailed)	.000	
	N	318	318

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

Table 15 shows an association between metacognitive and affective strategies. The correlation analysis indicates a high significant association between two variables (r=.641**) and (p=.000), which are metacognitive and affective strategies. According to Jackson (2015), correlation coefficients are considered significant at the .05 level and positive correlation is measured on a scale of 0.1 to 1.0. A weak positive correlation would be in the range of 0.1 to

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0.3, a moderate positive correlation between 0.3 to 0.5, and a strong positive correlation from 0.5 to 1.0. This means that there is also a strong positive relationship between metacognitive and affective strategies.

Conclusion

Summary of Findings and Discussions

The cognitive components in this study were measured in terms of rehearsal, organization, elaboration, and critical thinking. For rehearsal, the most selected strategy by students was memorizing key words of important concepts. As shown in Table 5, students regularly employ rehearsal strategies, particularly those involving memorization. Making and remembering lists of significant objects is the second most popular strategy for remembering crucial topics. Although less popular than the top two strategies, students also frequently reread their notes and course materials. The least preferred strategy was practicing material by repeating it out loud several times. Overall, the data indicate that students prefer written and mental memorization techniques over verbal repetition. These findings are comparable to those from Karpicke & O'Day's study (2024), which found that simple rereading the same material is not favoured by students. For the organization, students agree that they will go through their notes or any related readings to identify the most important ideas. For elaboration, students preferred to relate new material to what they already know while reading the course content. Lastly, for critical thinking, most students tend to question the things they hear or read in the course. Metacognitive self-regulation among students extended beyond simply recognizing confusion. It involves actively monitoring and adjusting their comprehension. When uncertainty occurs, students actively participate in self-examination to identify the specific ideas they do not understand, to pinpoint particular areas of confusion, which enables them to take focused corrective measures, like revisiting a challenging section or asking for assistance on a specific topic, instead of staying in a state of inactive doubt. This intentional and self-guided control of their learning process is the core of efficient metacognitive self-regulation.

Resource management is measured in terms of environment management, effort management, and help-seeking. Most students attend classes regularly as part of the program. By doing so, they place themselves in a setting where learning is the main priority, minimizing external distractions and ensuring engagement during instruction, discussions, and classroom activities. It is the essential initial action in managing their learning surroundings. In terms of effort management, students choose to work hard in their classes even when they do not enjoy the subject, and persist in studying course materials despite finding them dull or uninteresting. This demonstrates a strong level of resilience and self-control in their effort management. Their readiness to put in effort even in subjects they do not enjoy shows an emphasis on long-term objectives (e.g., succeeding in the course, obtaining a degree) rather than short-term feelings of boredom or indifference. Such determination when encountering boring or unengaging content is an essential ability, and an essential element of successful self-regulation. For help-seeking, students prefer to ask their classmates for assistance when they do not understand the material. The tendency to seek help from peers is an essential element of managing social resources. This approach is usually quicker and less daunting than approaching a teacher. It emphasizes dependence on a peer support system to elucidate perplexing ideas. This method, although successful, can also be a double-edged blade. Although it offers prompt responses and fosters teamwork abilities, it might not consistently deliver the comprehensive, expert guidance that a teacher can offer. Therefore, while effective, this method is best used alongside

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a more comprehensive help-seeking approach that might ultimately include the instructor for further explanation. The findings from this research align with those of Zubir et al. (2023), who discovered that learners in a supportive environment are committed to their education and seek assistance when necessary.

Pedagogical Implications and Suggestions for Future Research

The result of this study indicate that the majority of respondents understand and apply learning strategies, as shown in the scores for each question ranging from 3.0 to nearly 5.0. Future studies should consider increasing the number of items in every category for a broader analysis.

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