# Effects of Environmental Management on Students' Learning Strategies

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## ABSTRACT

Learning strategies are crucial for language acquisition, skill improvement, and overall mastery. Effective learning is highly dependent on environmental management, a strategy in which learners organize their physical and social surroundings to reduce distractions and increase learning effectiveness. Despite its importance, the specific mechanisms through which the learning environment influences a learner's choice of strategies remain under-explored. Furthermore, the application of these effective learning strategies receives insufficient attention from researchers and remains ambiguous in current literature. Hence, this study aims to examine the influence of environmental management on students' learning strategies, specifically its relationship with cognitive strategies, metacognitive self-regulation, and resource management. This study employed a quantitative survey, collecting data via a 5-point Likert scale instrument, which is divided into 3 main sections, focusing on: cognitive components, metacognitive self-regulation and resource management. The sample involved 286 respondents from University Technology MARA Selangor, comprising elementary and intermediate Japanese language students from science and technology, social sciences, and business academic backgrounds. The findings clearly show that students actively utilize cognitive, metacognitive, and resource management strategies. Statistical analyses also revealed a strong, positive, and significant relationship between environmental management and cognitive components, metacognitive self-regulation, and resource management. Ultimately, these findings offer theoretical implications by expanding existing knowledge on self-regulated learning environments. They also provide practical insights for educators and institutions to design, manage, and organize activities that promote more strategic and effective teaching and learning.

**Keywords**: learning strategies, environment, cognitive, metacognitive, self-regulation

## INTRODUCTION

### Background of Study

Learning strategies are crucial to language learning because they help students comprehend, retain, and use a language efficiently. According to Wenden (1987), "Learning strategies are the various operations that learners use in order to make sense of their learning." Effective learning depends not only on teachers, curriculum, or instructional resources but also on the quality of the environmental management in which learning occurs. Environment management is a self-regulated learning strategy in which learners intentionally organize and modify their physical and social learning environment to reduce distractions and enhance learning effectiveness. According to Pintrich (2000) and Wolters (2003) (in Yang et al., 2023), environment management refers to learners' behaviors of applying strategies to decrease distractions from the learning contexts by changing or adapting the environment to make it more conducive to task completion. The environment will provide stimulus to the learners. Good environments will help students ~~to~~ learn efficiently through the application of strategies to decrease distractions from the learning contexts by changing or adapting the environment to make it more conducive to task completion. Numerous studies in this field have demonstrated the significance of the environment for learning. Even though a lot of research has been done on this subject, it remains one of the most popular subjects. This is due to the fact that the environments of students are always changing.

This research aims to investigate the relationship between environment management and cognitive strategies, metacognitive self-regulation, and resource management. It also seeks to determine how environmental influences affect language learning.

**Statement of Problem**

Environmental management in educational settings has increasingly been recognized as an important factor influencing students' learning processes and outcomes. Previous studies have highlighted that a well-managed learning environment, including physical, psychological, and instructional dimensions, can significantly enhance students' engagement, concentration, and academic performance (Fraser, 2012; Dorman, 2008). More recent research suggests that effective environmental management contributes to the development of adaptive learning strategies, enabling students to regulate their learning, manage time effectively, and employ appropriate cognitive and metacognitive techniques (OECD, 2019; Zimmerman, 2002). These findings indicate that the learning environment plays a crucial role in shaping students' approach ~~to~~ and management of their learning.

Despite these contributions, several issues remain in the literature. First, many studies have primarily focused on the direct effects of environmental management on academic achievement, and often overlooking its influence on students' learning strategies as a mediating factor (Fraser 2012). Consequently, the relationship between environmental management and the development of effective learning strategies remains insufficiently examined. Second, existing research has produced inconsistent findings regarding how different components of environmental management, such as classroom organization, teachers' support, and physical conditions, affect students' strategic learning approaches across various educational contexts (Dorman, 2008). Furthermore, much of the previous research has focussed on general classroom settings, with limited attention given to how environmental management shapes diverse learning strategies among students with different needs and backgrounds.

These issues highlight the need for further investigations. Recent studies have emphasized the importance of exploring how environmental factors influence students' self-regulated learning and strategic behavior, particularly in dynamic and evolving educational environments (OECD 2019). In addition, recommendations for future research suggest the need to examine the specific mechanisms through which environmental management affects students' choice and the use of learning strategies (Zimmerman 2002). Such recommendations indicate a clear research gap in understanding the extent to which environmental management contributes to developing and implementing effective learning strategies among students.

Therefore, this study aimed to address these gaps by examining the effects of environmental management on students' learning strategies. By focusing on this relationship, this study aims to provide a more comprehensive understanding of how environmental factors influence strategic learning behavior. The findings are expected to contribute both theoretically—by extending existing knowledge on learning environments and self-regulated learning—and practically, by offering insights for educators and institutions to design and manage learning environments that promote effective learning strategies.

This rationale forms the basis for the development of the research objectives (RO) and research questions (RQ), which are designed to systematically investigate the relationship between environmental management and students' learning strategies.

**Research Questions**

This study is done to explore the influence of environmental management on learning strategies. Specifically, this study is done to answer the following questions;

- How do learners perceive environmental management in learning?
- How do learners perceive cognitive strategies in learning?
- How do learners perceive their metacognitive self-regulation in learning?

- How do learners perceive resource management in learning?
- Is there a significant relationship between environmental management and cognitive strategies?

$H_{01}$: There is no significant relationship between environmental management and cognitive strategies

- Is there a significant relationship between environmental management and metacognitive self-regulation?

$H_{01}$: There is no significant relationship between environmental management and metacognitive self-regulation

- Is there a significant relationship between environmental management and resource management?

$H_{03}$: There is no significant relationship between environmental management and resource management.

# LITERATURE REVIEW

## Theoretical Framework of the Study

- Social Cognitive Theory (Bandura, 1986) and Learning

Social Cognitive Theory is a learning theory that has emerged based on the idea that people learn by watching what others do and that human thought processes are central to comprehending personality. It originated and evolved from the social learning theory (Bandura, 1977). According to the theory, an individual's behavior, environment, and personal variables interact dynamically and reciprocally to shape their behavior and they always influence one another (Nickerson, 2025). Behavior is influenced by personal factors, while the environment is influenced by behavior, and the cycle repeats.

- Learner's Strategies

Learning strategies refer to the specific approaches, techniques, and actions that students use to acquire, process, and retain information. Grounded in self-regulated learning theory, these strategies encompass cognitive, metacognitive, and behavioral processes that enable learners to plan, monitor, and evaluate their learning (Zimmerman, 2002). Cognitive strategies include activities such as summarizing, organizing, and elaborating on information, whereas metacognitive strategies involve self-monitoring and reflection during the learning process. Additionally, resource management strategies such as time management, help-seeking, and maintaining a conducive learning environment play an essential role in enhancing learning outcomes. Research indicates that students who employ effective learning strategies demonstrate higher academic performance, greater motivation, and improved problem-solving skills (Pintrich, 2004). In this study, learning strategies are viewed as dynamic and context-dependent behaviors that can be influenced by environmental management, thus highlights the importance of well-structured learning environments in promoting effective, strategic learning.

## Past Studies

- Past Studies on Environment and Learning Strategies

Many studies have been done to investigate learning strategies. One of them is a study by Ramlee et al. (2014), who conducted a study on environmental factors and student learning approaches of Malaysian polytechnic students. This study used the Course Experience Questionnaire (CEQ) Revised Two-Factor Study Process Questionnaire (RSPQ-2F) to obtain data. The survey was conducted at Malaysian polytechnics, involving 527 final-year students. The learning environment factors are based on Moos's (1974) scheme. The results indicate that good teaching is a major factor affecting the increase in students' deep approach, followed by the assessment, learning resources, and clear objectives.

Another study, carried out by Tabinas et al. (2023), looked into college students' motivation, learning strategies, and how they relate to the online learning environment. A study involving 150 college students was carried out.

They used a correlational design to assess the current relationship between learning tactics, motivation, and the online environment. The results of the statistical study indicate a strong correlation between various learning styles, motivation levels, and the online learning environment. As a result, better learning processes and more student motivation are linked to better online learning environments.

**Conceptual Framework of the Study**

Learning requires learners to depend on motivation to stay focused (Rahmat & Thasrabian, 2024). For some learners, motivations come from within, while for others, the environment creates a source of motivation. According to Wenden & Rubin (1987), there are three main strategies for learning, and they are (i) cognitive (rehearsal, organization, elaboration, and critical thinking), (ii) metacognitive strategies, and (iii) resource management (environment management, effort management, and help-seeking). Bandura (1986) states that motivation (for learning) comes from the person, their behaviour, and their environment. A positive environment can give a positive learning experience, and vice versa. Figure 1 shows the conceptual framework of the study. This study explores the influence of environmental management on learning. Specifically, this study also investigates if there is a relationship between environmental management and all learning strategies.

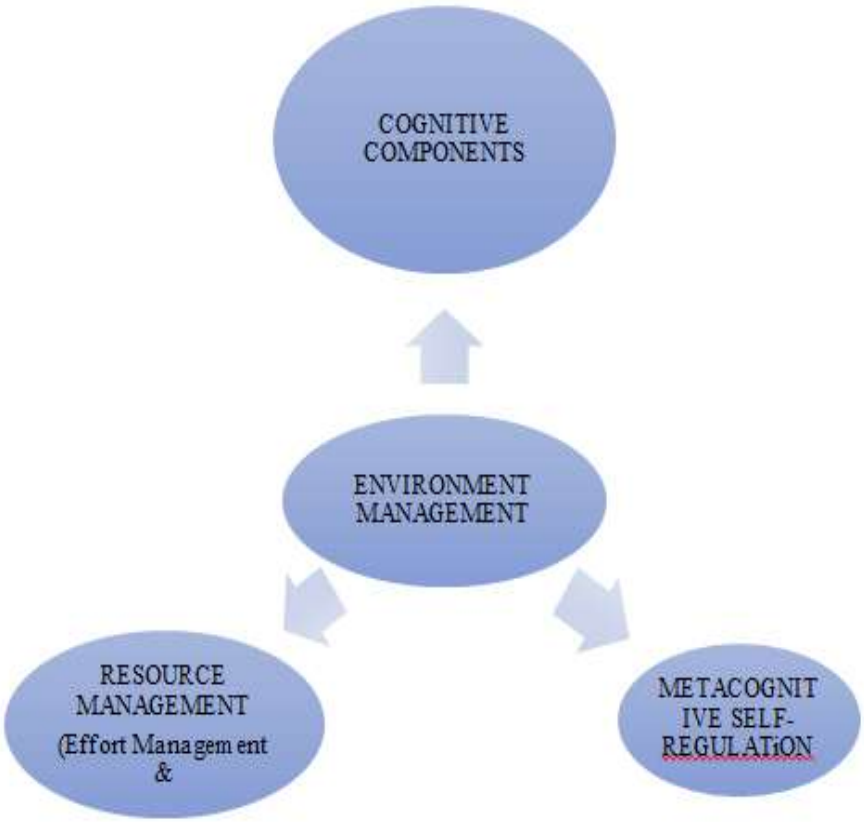


Figure 1 -Conceptual Framework of the Study

The Influence of Environmental Management on Learning Strategies

## METHODOLOGY

This quantitative study is done to explore the influence of environmental management on learning strategies. A convenient sample of 286 participants responded to the survey. The instrument used is a 5 Likert-scale survey and is rooted from Wenden and Rubin (1987) to reveal the variables in table 3 below. Table 1 below shows the categories used for the Likert scale; 1 is for Strongly Disagree, 2 is for Disagree, 3 is for Undecided, 4 is for Agree and 5 is for Strongly Agree.

Table 1- Likert Scale Use

| NO | SCALE |
|---|---|
| 1 | Strongly Disagree |
| 2 | Disagree |
| 3 | Undecided |
| 4 | Agree |
| 5 | Strongly Agree |

Table 2- Distribution of Items in the Survey

| | VARIABLE (KEYWORD) | | CONSTRUCT | ITEM | TO ITEM/ Cronbach alpha |
|---|---|---|---|---|---|
| A | COGNITIVE COMPONENTS | (a) | Rehearsal | 4 | 19 (.939) |
| | | (b) | Organization | 4 | |
| | | (c ) | Elaboration | 6 | |
| | | (d) | Critical Thinking | 5 | |
| B | METACOGNITIVE SELF-REGULATION | | | | 11(.886) |
| C | | (a) | Environment Management | 4 | 4(.835) |
| D | RESOURCE MANAGEMENT | (b) | Effort Management | 4 | 8(.710) |
| | | (c ) | Help-Seeking | 4 | 42 (.954) |

Table 2 shows the distribution of items in the survey. Section A has 19 items on Cognitive components. Section B has 11 items on Metacognitive self-regulation. Section C has 4 items on Environment management, and Section D has 8 items on Resource Management.

Table 3- Reliability Levels, Cronbach's Alpha Ranges, and Their Interpretations

| Reliability Level | Cronbach's Alpha range | Interpretation |
|---|---|---|
| Excellent | 0.9 and above | Indicates very high internal consistency |
| Good | 0.80-0.89 | Reflects strong internal consistency |
| Acceptable | 0.70-0.79 | Indicates acceptable internal consistency |
| Questionable | 0.60-0.69 | Reflects questionable internal consistency |
| Poor | Below 0.6 | Indicates poor internal consistency |

In order to determine the internal reliability of the instrument, reliability analysis is conducted. Table 3 above shows the distribution and interpretation of Cronbach Alpha range. According to Ahmad et.al. (2024), Cronbach Alpha scores between 0.7 to 0.9 are considered acceptable to excellent.

Table 2 also shows the reliability of the survey. The analysis shows a Cronbach alpha of .939 for Cognitive components, .886 for Metacognitive self-regulation, .835 for Environment management, and .710 for Resource management. The overall Cronbach alpha for all 42 items is .954; thus, revealing a good reliability of the instrument chosen/used. Further analysis using SPSS is done to present findings to answer the research questions for this study.

# FINDINGS

## Demographic Analysis

According to Zienefuss et al. (2021), researchers report demographic data in percentages to establish sample representatives and allow for generalizability to a larger population. The reporting also provides an overview of participants' characteristics. Percentages offer a clear and understandable picture of the sample makeup.

Table 4- Percentage for Demographic Profile

| Question | Demographic Profile | Categories | Percentage (%) |
|---|---|---|---|
| 1 | Gender | Male | 30% |
| | | Female | 70% |
| 2 | Field | Science & Technology | 47% |
| | | Social Sciences & Business | 53% |
| 4 | Level | Beginner | 47% |
| | | Intermediate | 42% |
| | | Advanced | 11% |

Table 4 explains the demographic profile of the respondents involved in this study. It includes the gender of the sample, their academic field, and their level of Japanese language proficiency. The respondents were mostly female but were balanced in terms of educational background and mostly consisted of individuals with basic or intermediate Japanese language proficiency. 70% of the respondents were female, while only 30% were male. In contrast to the gender difference, the academic backgrounds of the respondents were balanced. Over 53% of the respondents had backgrounds in the social sciences and business, while 47% belonged to the science and technology fields. Regarding the level of Japanese proficiency, the data obtained showed that the respondents were students who were still in the process of mastering Japanese. 47% of the respondents were at the basic level and 42% at the intermediate level. Combined, these groups represented 89% of the total sample. On the other hand, only a small minority of 11% classified themselves as advanced.

## Descriptive Statistics

Why is there a need to report the mean and standard deviation? According to Vetter (2017), Mean (M) represents the average, or center of a data set. Standard deviation (SD) indicates the typical distance of individual observations from the mean which shows the data's variability or spread. A low SD means the data points are clustered close to the whole high mean. SD indicates they are more spread out. It is good to have a high SD.

**Findings for Environment Management (RO1)**

This section presents data to answer research question 1: How do learners perceive environmental management in learning?

Table 5- Mean (M) and Standard Deviation (SD) for Environment Management (5 items)

| ITEM | M | SD |
|---|---|---|
| RMCEMQ1I usually study in a place where I can concentrate on my course work. | 4.17 | 0.79 |
| RMCEMQ 2I make good use of my study time for the courses in this program. | 3.93 | 0.75 |
| RMCEMQ3I have a regular place set aside for studying | 3.87 | 0.79 |
| RMCEMQ 4Imake sure that I keep up with the weekly readings and assignments for the courses. | 4.39 | 0.76 |

Table 5 presents the mean and standard deviation scores for students' environment management practices. The findings show that the mean scores range from 3.87 to 4.39, which indicates that students demonstrate relatively strong environment management skills. The highest mean score is RMCEMQ4 (M = 4.39, SD = 0.76). This suggests that most students are disciplined in managing academic tasks and maintaining consistent study habits. Students also reported studying in places where they could concentrate on coursework (M = 4.17, SD = 0.79), indicating their awareness that a conducive learning environment is important. The item RMCEMQ 2 also shows a relatively high mean (M = 3.93, SD = 0.75), reflecting effective time utilization among students. The lowest mean score was RMCEMQ3 for having a regular place set aside for studying (M = 3.87, SD = 0.79), which may imply that some students lack a fixed place for study. The relatively low standard deviation values across all items indicate that responses were fairly consistent among participants.

**Findings for Cognitive Components (RO2)**

This section presents data to answer research question 2: How do learners perceive cognitive strategies in learning? In the context of this study, this is measured by (i) rehearsal, (ii) organization, (iii) elaboration and (iv) critical thinking.

Table 6- Mean (M) and Standard Deviation (SD) for Rehearsal (4 items)

| ITEM | M | SD |
|---|---|---|
| LSCCRQ1When I study for the classes, I practice saying the material to myself over and over. | 3.81 | 0.77 |
| LSCCRQ 2When studying for the courses, I read my class notes and the course readings over and over again. | 3.93 | 0.80 |
| LSCCRQ 3I memorize key words to remind me of important concepts in this class. | 3.97 | 0.71 |
| LSCCRQ 4I make lists of important items for the courses and memorize the lists. | 3.84 | 0.83 |

Table 6 shows the mean and standard deviation scores for students' use of rehearsal strategies in learning. The results show that the mean scores range from 3.81 to 3.97, which indicates that students moderately to highly employ rehearsal techniques to support their learning process. The highest mean score was the item LSCCRQ3 (M = 3.97, SD = 0.71). This suggests that students frequently rely on keyword memorization as a strategy to remember important information. The second-highest mean score was the item LSCCRQ2, where students repeatedly read class notes and course materials (M = 3.93, SD = 0.80), which shows that repetition is used consistently when studying. Meanwhile, LSCCRQ practicing by repeating saying the materials to themselves

(M = 3.81, SD = 0.77) and making lists of important items to memorize (M = 3.84, SD = 0.83) also showed relatively high mean scores. It shows that the students have an active engagement in rehearsal-based learning methods. All the standard deviation values are below 1.00, which indicates that responses were fairly consistent among participants.

Table 7—Mean (M) and Standard Deviation (SD) for Organization (4 items)

| ITEM | M | SD |
|---|---|---|
| LSCCOQ1 When I study the readings for the courses in the program, I outline the material to help me organize my thoughts. | 3.70 | 0.80 |
| LSCCOQ 2 When I study for the courses, I go through the readings and my class notes and try to find the most important ideas. | 3.89 | 0.73 |
| LSCCOQ 3I make simple charts, diagrams, or tables to help me organize course materials in this program. | 3.19 | 0.96 |
| LSCCOQ 4 When I study for the courses, I go over my class notes and make an outline of important concepts. | 3.79 | 0.78 |

Table 7 presents the mean and standard deviation scores for students' use of organizational learning strategies. The mean scores for all items were between 3.19 and 3.89. The findings suggest that students demonstrate a moderate level of organizational skills in managing and structuring course materials. The highest mean score was for Item LSCCOQ2 (M = 3.89, SD = 0.73), demonstrating that students can generally recognize important ideas while studying. Likewise, students reported going over their course notes and summarizing key ideas (M = 3.79, SD = 0.78), reflecting the application of structured study techniques. Outlining reading materials to arrange ideas also recorded a moderate mean score (M = 3.70, SD = 0.80). The lowest mean score was observed for Item LSCCOQ3 (M = 3.19, SD = 0.96), indicating that students use visual organizational tools less frequently. Overall, the standard deviation for all items is relatively low. The slightly higher SD for LSCCOQ3 reflects greater variation in students' use of charts, diagrams, and tables as learning aids/tools.

Table 8—Mean (M) and Standard Deviation (SD) for Elaboration (6 items)

| ITEM | M | SD |
|---|---|---|
| LSCCEQ1 When I study for the courses in this program, I pull together information from different sources, such as lectures, readings, and discussions. | 3.65 | 0.81 |
| LSCCEQ 2I try to relate ideas in one subject to those in other courses whenever possible | 3.48 | 0.84 |
| LSCCEQ 3When reading for the courses, I try to relate the material to what I already know. | 3.92 | 0.72 |
| LSCCEQ 4When I study for the courses in this program, I write brief summaries of the main ideas from the readings and my class notes. | 3.52 | 0.87 |
| LSCCEQ 5I try to understand the material in the classes by making connections between the readings and the concepts from the lectures. | 3.78 | 0.69 |
| LSCCEQ 6I try to apply ideas from course readings in other class activities such as lecture and discussion. | 3.63 | 0.77 |

The results presented in Table 8 indicate that students generally demonstrate a relatively high level of engagement with elaboration learning strategies. The highest mean score was observed for LSCCEQ3 (M = 3.92, SD = 0.72), suggesting that students frequently related new information to their prior knowledge when engaging

with course materials. This was followed by LSCCEQ5 (M = 3.78, SD = 0.69), indicating that students actively establish connections between readings and lecture concepts to enhance their understanding. Similarly, LSCCEQ1 (M = 3.65, SD = 0.81) and LSCCEQ6 (M = 3.63, SD = 0.77) reflected students' tendency to integrate information from multiple sources and apply learned concepts across different learning activities. Comparatively, slightly lower mean scores were recorded for LSCCEQ4 (M = 3.52, SD = 0.87) and LSCCEQ2 (M = 3.48, SD = 0.84), indicating moderate engagement in summarizing learning materials and relating ideas across subjects. Overall, the findings suggest that students actively employ elaboration strategies, particularly in connecting new knowledge with existing understanding and integrating information across various learning contexts, thereby supporting effective and meaningful learning.

Table 9- Mean (M) and Standard Deviation (SD) for Critical Thinking (5 items)

| ITEM | M | SD |
|---|---|---|
| LSCCCTQ1I often find myself questioning things I hear or read in the courses to decide if I find them convincing. | 3.65 | 0.77 |
| LSCCCTQ 2When a theory, interpretation, or conclusion is presented in classes or in the readings, I try to decide if there is good supporting evidence. | 3.47 | 0.77 |
| LSCCCTQ 3I treat the course materials as a starting point and try to develop my own ideas about it. | 3.62 | 0.75 |
| LSCCCTQ 4I try to play around with ideas of my own related to what I am learning in the courses. | 3.67 | 0.74 |
| LSCCCTQ 5Whenever I read or hear an assertion or conclusion in the classes, I think about possible alternatives. | 3.52 | 0.79 |

The results presented in Table 9 indicate that the students demonstrated a moderate to relatively high level of engagement in critical thinking strategies. The highest mean score was observed for LSCCCTQ4 (M = 3.67, SD = 0.74), suggesting that students frequently generated and explored their own ideas in relation to course content. This was closely followed by LSCCCTQ1 (M = 3.65, SD = 0.77), indicating a tendency among students to critically question information encountered in their courses. Furthermore, LSCCCTQ3 (M = 3.62, SD = 0.75) reflects students' ability to utilize course materials to develop their own interpretations. Moderate levels of engagement were also evident in LSCCCTQ5 (M = 3.52, SD = 0.79), which suggests that students consider alternative perspectives when evaluating assertions, and LSCCCTQ2 (M = 3.47, SD = 0.77), indicating comparatively lower but still consistent efforts in assessing the supporting evidence. Overall, the findings suggest that students exhibit a satisfactory level of critical thinking, particularly in questioning, idea development, and exploration, which are essential components for fostering higher-order cognitive processes and meaningful learning.

**Findings for Metacognitive Self- Regulation Components (RO3)**

This section presents data to answer research question 3: How do learners perceive metacognitive self-regulation in learning?

Table 10- Mean (M) and Standard Deviation (SD) for Metacognitive Self-Regulation (11 items)

| ITEM | M | SD |
|---|---|---|
| MSSRQ1During class time, I often miss important points because I am thinking of other things. | 2.86 | 0.92 |

| | | |
|---|---|---|
| MSSRQ 2When reading for the courses, I make up questions to help focus my reading. | 3.42 | 0.81 |
| MSSRQ 3When I become confused about something I am reading for the classes, I go back and try to figure it out. | 3.80 | 0.75 |
| MSSRQ 4If course readings are difficult to understand, I change the way I read the material. | 3.70 | 0.80 |
| MSSRQ 5Before I study new course material thoroughly, I often skim it to see how it is organized | 3.60 | 0.79 |
| MSSRQ 6I ask myself questions to make sure I understand the material I have been studying in this program. | 3.71 | 0.76 |
| MSSRQ7I try to change the way I study in order to fit any course requirements and the instructors' teaching style. | 3.62 | 0.80 |
| MSSRQ8I 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. | 3.60 | 0.76 |
| MSSRQ 9When studying for the courses in this program I try to determine which concepts I do not understand well. | 3.76 | 0.71 |
| MSSRQ 10When I study for the courses, I set goals for myself in order to direct my activities in each study period. | 3.62 | 0.79 |
| MSSRQ 11If I get confused taking notes in classes, I make sure I sort it out afterwards. | 3.76 | 0.77 |

The data shows that respondents generally demonstrated a relatively high level of metacognitive self-regulation, as most items have the mean scores above 3.5. Respondents consider themselves to be very active learners in learning and constantly diversify their language learning strategies. The highest mean score was observed for MSSRQ3 (M = 3.80, SD = 0.75), which suggests that whenever they met with problems, the students frequently went back and tried to figure it out. The second highest mean scores were for the items MSSRQ 9 and MSSRQ 11, both with the mean scores of 3.76, showing that while studying, the students try to determine which concepts they do not understand well and to make sure to sort them out afterwards. The lowest mean score (2.86) is recorded for the item MSSRQ1 for "During class time, I often miss important points because I am thinking of other things." Meanwhile, the Standard deviation values ranging from 0.71 to 0.92, show relatively low variability in responses. This implies that the metacognitive patterns among the respondents are consistent.

**Findings for Resource Management (RO4)**

This section presents data to answer research question 5: How do learners perceive resource management in learning? In the context of this study, this is measured by (i) effort management and (ii) help-seeking.

Table 11- Mean (M) and Standard Deviation (SD) for Effort Management (4 items)

| ITEM | M | SD |
|---|---|---|
| RMCEMQ1I have a regular place set aside for studying | 3.72 | 0.87 |
| RMCEMQ 2I work hard to do well in the classes in this program even if I do not like what we are doing. | 3.87 | 0.76 |
| RMCEMQ 3When course work is difficult, I either give up or only study the easy parts. | 2.72 | 1.09 |

| | | |
|---|---|---|
| RMCEMQ 4 Even when course materials are dull and uninteresting, I manage to keep working until I finish. | 3.84 | 0.85 |

Table 11 presents the mean and standard deviation scores for four items related to effort management among the respondents. Overall, the findings show that the respondents demonstrated a relatively high level of effort management in their learning process. The highest mean score was RMCEMQ2 with a mean of 3.87 and a standard deviation of 0.76. The comparatively low SD shows consistency in responses, and this suggests that the majority of respondents were willing to put effort into their studies despite a lack of interest in some activities. Similarly, RMCEMQ4 obtained a high mean score of 3.84 with an SD of 0.85. This result suggests that even when the contents were uninteresting, the respondents generally showed perseverance and resolve in finishing academic tasks. The item RMCEMQ1 recorded a mean of 3.72 and an SD of 0.87, demonstrating that respondents moderately agreed that they maintained a consistent study environment. This shows that setting up a specific area for learning is rather a good practice. In contrast, RMCEMQ3 had the lowest mean score of 2.72 and the highest SD of 1.09. Since this is a negatively worded item, the lower mean suggests that respondents generally disagreed with giving up when facing difficult coursework. The higher standard deviation, however, suggests that responses were more variable, indicating that some respondents still had trouble sustaining effort when faced with challenging tasks.

Overall, the results suggest that the respondents possessed positive effort management strategies, particularly in terms of persistence, hard work, and maintaining motivation despite difficult or uninteresting course content.

Table 12- Mean (M) and Standard Deviation (SD) for Help-Seeking (2 items)

| ITEM | M | SD |
|---|---|---|
| RMCHSQ1When I cannot understand the material in a course, I ask my lecturer for help. | 3.60 | 0.82 |
| RMCHSQ 2 When I cannot understand the material in a course, I ask another student in the class for help. | 4.10 | 0.82 |
| RMCHSQ 3 When I cannot understand the material in a course, I ask my friends from other class for help. | 3.61 | 1.02 |
| RMCHSQ 4 When I cannot understand the material in a course, I ask my seniors who have taken the course previously for help. | 2.84 | 1.17 |

The results presented in Table 12 indicate that students demonstrate a generally moderate to high level of engagement in help-seeking strategies, consistent with the patterns observed for other learning strategies. The highest mean score was recorded for RMCHSQ2 (M = 4.10, SD = 0.82), indicating that students predominantly seek assistance from peers within the same class when encountering difficulties, reflecting their strong reliance on immediate and accessible sources of support. This was followed by RMCHSQ3 (M = 3.61, SD = 1.02) and RMCHSQ1 (M = 3.60, SD = 0.82), suggesting that students were also moderately engaged in seeking help from friends outside the class and lecturers. Notably, the standard deviation for RMCHSQ3 is greater than 1, indicating relatively high variability in students' responses for this item. In contrast, RMCHSQ4 recorded the lowest mean (M = 2.84, SD = 1.17), indicating that students were less likely to seek assistance from seniors who had completed the course. Similarly, the standard deviation for RMCHSQ4 exceeds 1, further highlighting the substantial variability in help-seeking from seniors. Overall, the findings reveal a consistent pattern with earlier results on elaboration and critical thinking, where students actively engage in adaptive learning strategies with a stronger preference for immediate and familiar support systems. This reflects a balanced but context-dependent use of help-seeking behavior that contributes to effective learning.

**Exploratory Statistics**

According to He (2024), correlation is a statistical technique that shows how strongly two variables are related to each other or the degree of association between the two. It's a common tool for describing simple relationships without making a statement about cause and effect. This section presents data to answer the research question on correlation.

According to He (2024), the coefficient is significant at the .05 level and positive correlation is measured on a 0.1 to 1.0 scale. Weak positive correlation would be in the range of 0.1 to 0.3, moderate positive correlation from 0.3 to 0.5, and strong positive correlation from 0.5 to 1.0.

To determine if there is a significant association in the mean scores between all components in learning, data is analyzed using SPSS for correlations. Results are presented separately in Table 13 below.

Table 13- Correlation between all components in learning

**Correlations**

| | | ENVIRONMENT_MANAGEMENT | COGNITIVE | METACOGNITIVE | RESOURCE_MANAGEMENT |
|---|---|---|---|---|---|
| ENVIRONMENT MANAGEMENT | Pearson Correlation | 1 | .595** | .666** | .535** |
| | Sig. (2-tailed) | | <.001 | <.001 | <.001 |
| | N | 286 | 286 | 286 | 286 |
| COGNITIVE | Pearson Correlation | .595** | 1 | .785** | .599** |
| | Sig. (2-tailed) | <.001 | | <.001 | <.001 |
| | N | 286 | 286 | 286 | 286 |
| METACOGNITIVE | Pearson Correlation | .666** | .785** | 1 | .584** |
| | Sig. (2-tailed) | <.001 | <.001 | | <.001 |
| | N | 286 | 286 | 286 | 286 |
| RESOURCE_MANAGEMENT | Pearson Correlation | .535** | .599** | .584** | 1 |
| | Sig. (2-tailed) | <.001 | <.001 | <.001 | |
| | N | 286 | 286 | 286 | 286 |

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

**Findings for the Relationship between environmental management and cognitive components (RO5)**

This section presents data to answer research question 6: Is there a significant relationship between environmental management and cognitive components?

$H_{01}$: There is no significant relationship between environmental management and cognitive components

Table 13 shows that there is a strong and positive relationship between environmental management and cognitive components (r=.595**) and (p=.000). Null hypothesis is rejected for $H_{01}$.

Findings for the Relationship between environmental management and metacognitive self-regulation (RO6)

This section presents data to answer research question 7: Is there a significant relationship between environmental management and metacognitive self-regulation?

$H_{02}$: There is no significant relationship between environmental management and metacognitive self-regulation

Table 13 also reveals that there is a strong and positive relationship between environmental management and metacognitive self-regulation (r=.666**) and (p=.000). Null hypothesis is rejected for $H_{02}$.

**Findings for the Relationship between environmental management and resource management (RO7)**

This section presents data to answer research question 8: Is there a significant relationship between environmental management and resource management?

$H_{03}$: There is no significant relationship between environmental management and resource management.

Table 13 also reveals that there is a strong and positive relationship between environmental management and resource management (r=.535**) and (p=.000). Null hypothesis is rejected for $H_{03}$.

# CONCLUSION

## Summary of Findings and Discussion

This study examines the influence of environmental management on Japanese language learning strategies. First, students are disciplined and adept at finding environments conducive to focus, though they prefer dynamic, changing locations rather than studying in a single, fixed place. This study is in accordance with the study by Wenden (1987), “Learning strategies are the various operations that learners use in order to make sense of their learning." They are also good at choosing good locations to focus their attention. The least used by students is choosing a fixed environment and location. This indicates that students’ environments are more dynamic and constantly changing.

Second, the finding on Cognitive Strategies. Students rely heavily on memorization, connecting new information to existing knowledge, and generating their own ideas. However, they rarely use visual aids like charts and diagrams. The item is, students actively use various cognitive strategies, placing strong emphasis on memorizing keywords and relating new material to existing knowledge. As mentioned by OECD (2019) and Zimmerman (2002), effective environmental management contributes to the development of adaptive learning strategies, enabling students to regulate their learning, manage time effectively, and employ appropriate cognitive and metacognitive techniques.

Third, the finding on Metacognitive Self-Regulation is that students proved to be very pro-active self-regulators. They relied heavily on "correction" strategies, frequently revisiting referenced materials and actively organizing notes after class. The main challenge identified was maintaining sustained focus due to missing important points during lectures due to other distractions. This finding is supported by Dorman (2008) regarding how different components of environmental management, such as classroom organization, teachers’ support, and physical conditions, affect students’ strategic learning approaches across various educational contexts.

Next, the finding on Resource Management. The item is, students showed their effort, showing high persistence in completing assignments even when the assignments were boring or uninteresting. They rarely gave up when faced with difficult coursework. Students highly prioritized an immediate support system, namely getting help from classmates, while getting help from seniors was the least popular approach. As mentioned by Nickerson

(2025), an individual's behavior, environment, and personal variables interact dynamically and reciprocally to shape their behavior and always influence one another. This finding is supported by Bandura (1977). Social Cognitive Theory is a learning theory that has emerged based on the idea that people learn by watching what others do and that human thought processes are central to comprehending personality. As mentioned by Pintrich (2004), in this study, learning strategies are viewed as dynamic and context-dependent behaviors that can be influenced by environmental management, highlighting the importance of well-structured learning environments in promoting effective, strategic learning.

Lastly, the finding in correlation is statistical analysis that rejects all null hypotheses. This proves that there is a significant positive relationship between environmental management and cognitive components, metacognitive self-regulation, and resource management. The significant and positive correlations found in this study are consistent with the study of Tabinas et al. (2023), which showed a strong correlation between learning strategies, motivation, and learning environment. And, these results are consistent with the findings of Ramlee et al. (2014) that a well-structured learning environment is a major factor that influences and enhances students' learning approaches.

## Implications and Suggestions for Future Research

### Theoretical and Conceptual

The findings of this study align with Bandura's Social Cognitive Theory (1986). Environmental management is closely related to cognitive and metacognitive strategies. This study supports the theory that the environment and individual behavior interact in a dynamic and reciprocal manner during learning activities. Furthermore, this research corroborates the conceptual framework proposed by Wenden and Rubin (1987) by clearly demonstrating that environmental management acts as a key factor in increasing the use of various cognitive, metacognitive, and self-management strategies.

### Pedagogical Implications

Since the most frequently used tool is environmental strategies, educators should emphasize the importance of structured learning environments by promoting time management skills, designated study spaces, and active class participation. Educators should be equipped with a lot of strategies that they will be able to propose to students so that they can deal with difficult academic tasks. If, for instance, one strategy does not work, they should be able to suggest another alternative.

The important role of environmental stewardship, educators, and institutions must actively design conducive classes and activities that support learning strategies. Challenged with sustained attention during class, educators should design activities that will require them to make use of a variety of strategies, and after the completion of the task, they should hold a discussion session with students, talking about the strategies they made use of, whether these strategies are proven to be useful or not.

As students strongly favor one-to-one help-seeking, educators can provide positive reinforcement or establish group study teams to help students cultivate a positive self-regulated learning mindset. Finally, because of the low use of charts and diagrams, educators should use cognitive engagement by encouraging the use of visual aids to help students diversify their cognitive strategies.

### Future Research Suggestions

89% of the respondents in this study were beginning and intermediate language learners; further research on the relationship between environmental management and learning styles might focus on factors such as environment, motivation, performance, and the length of exposure to the language. This might influence the perceptual learning styles and the language learning strategy use of the language learners. Future studies should consider using qualitative methods, such as interviews or focus groups, to gain a deeper and more understanding of why learners prefer certain environments and strategies. Therefore, we recommend future studies to examine teachers' awareness and readiness in language learning strategies.

Future studies can operationalize to use qualitative methods like interviews and focus groups. By targeting the most surprising or highly variable quantitative results from the survey, qualitative data can bridge the gap between *what* students do and *why* they do it. Researchers can assemble focus groups of these language learners to discuss how they choose their study spots. Group discussions can reveal shared cultural behaviors, campus infrastructure limitations (e.g., noisy dorms, crowded libraries), or specific preferences for ambient noise (like studying in cafes) that a 5-point scale cannot capture.

To address the inherent limitations of relying strictly on self-reported Likert-scale data, future study should adopt a mixed-methods design to build upon the current study's statistical foundation. While the existing quantitative findings successfully establish significant positive correlations between environmental management and students' cognitive, metacognitive, and resource management strategies, they inherently lack the capacity to explain the underlying mechanisms driving this attitude. By incorporating qualitative instruments such as semi-structured interviews and focus groups, future study can deeply explore the localized contextual factors that influence these statistical trends. Lastly, as explicitly recommended in this study, triangulating quantitative metrics with qualitative insights will more comprehensively understand the learner's preferences, thereby providing educators with actionable, nuanced insights for designing optimal self-regulated learning environments.

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