

# Students' Perceptions of Teacher-Implemented Mnemonic Strategies and Their Self-Reported Learning in Science

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## ABSTRACT

Learners in rural public secondary schools often struggle to recall scientific terms and understand concept-heavy lessons, making Science a challenging subject for many. Strengthening their ability to remember and make sense of key ideas is essential for improving comprehension and confidence. However, limited research has examined how students perceive teacher-implemented mnemonic strategies and how these perceptions relate to their self-reported learning, particularly in rural school contexts with limited instructional resources.

This study explored students' perceptions of teacher-implemented mnemonic strategies and their relationship with self-reported learning in Science. A quantitative descriptive-correlational research design was employed involving forty-two (42) Grades 9 and 10 students of Sto. Domingo Integrated School in Quezon, Bukidnon, Philippines. Data were collected using an adopted Likert-scale questionnaire that underwent pilot testing to establish reliability. The findings revealed favorable perceptions of mnemonic strategies ( $M = 3.88$ ,  $SD = 0.56$ ) and a high level of self-reported learning in Science ( $M = 4.04$ ,  $SD = 0.48$ ). Pearson Product-Moment Correlation analysis indicated a moderate positive and statistically significant relationship between students' perceptions of mnemonic strategies and their self-reported learning ( $r = 0.564$ ,  $p < .001$ ). Students who reported more favorable perceptions of mnemonic strategies also tended to report higher levels of self-reported learning in Science. The findings suggest that positive perceptions of teacher-implemented mnemonic strategies are associated with higher levels of self-reported learning in Science. However, the correlational nature of the study does not establish causal relationships, and self-reported learning should not be interpreted as a direct measure of academic achievement. The study highlights the potential value of mnemonic strategies as instructional tools that may support students' learning experiences and engagement in rural Science classrooms.

**Keywords:** mnemonic strategies, self-reported learning, science education, student perceptions, secondary students

## INTRODUCTION

Many students continue to experience difficulties in learning Science, particularly in recalling scientific terminology and understanding abstract concepts. Challenges in remembering key ideas often affect students' academic performance, classroom participation, and confidence in learning. This concern is reflected in large-scale assessments, with Filipino students obtaining a Science score of 355 in the 2022 Programme for International Student Assessment (PISA), substantially below the OECD average (OECD, 2023). Similarly, results from the National Achievement Test indicate persistent gaps in students' mastery of fundamental scientific concepts (Department of Education, 2022).

Science education requires students to learn and retain a substantial amount of new information, including scientific terms, processes, and relationships among concepts. However, traditional instructional approaches may not always provide adequate support for memory retention and meaningful learning. Consequently, educators continue to explore instructional strategies that can enhance students' understanding and recall of scientific content.

One strategy that has gained attention is the use of mnemonic techniques. Mnemonic strategies, such as acronyms, rhymes, keywords, and visual associations, are designed to facilitate memory by linking new information with familiar cues. Previous studies have reported that mnemonic-based instruction can improve students' retention, comprehension, and engagement across various subject areas, particularly those involving complex terminology and factual information (Babalola, 2023).

Beyond academic achievement, students' perceptions of instructional strategies may influence their learning experiences. Self-reported learning reflects learners' perceptions of their understanding, confidence, and engagement with instructional content (Huang & Mayer, 2022). Examining students' perceptions of mnemonic strategies alongside their self-reported learning may provide valuable insights into the effectiveness of these instructional approaches.

Despite the documented benefits of mnemonic techniques, limited research has examined the relationship between students' perceptions of teacher-implemented mnemonic strategies and their self-reported learning in Science, particularly in rural Philippine secondary schools. Addressing this gap may contribute to a better understanding of how memory-support strategies are perceived to support Science learning in resource-constrained educational settings.

While previous studies have reported positive outcomes associated with mnemonic-based instruction, the present study does not seek to establish causal effects between mnemonic strategies and learning outcomes. Instead, it examines whether students' perceptions of teacher-implemented mnemonic strategies are related to their self-reported learning in Science. Because self-reported learning reflects students' perceptions rather than objective academic performance, it should not be interpreted as a direct measure of academic achievement. Examining this relationship may provide valuable insights into how students perceive memory-support strategies in Science classrooms, particularly in rural school settings.

Therefore, this study examined the relationship between students' perceptions of teacher-implemented mnemonic strategies and their self-reported learning in Science among Grades 9 and 10 students of Sto. Domingo Integrated School. Specifically, the study aimed to: (1) assess the level of students' perceptions of teacher-implemented mnemonic strategies in learning Science; (2) determine the level of students' self-reported learning in Science; and (3) examine the significant relationship between students' perceptions of teacher-implemented mnemonic strategies and their self-reported learning in Science.

## METHODOLOGY

### Research Design

This study employed a quantitative descriptive-correlational research design to examine the relationship between students' perceptions of teacher-implemented mnemonic strategies and their self-reported learning in Science among Grades 9 and 10 students of Sto. Domingo Integrated School, Quezon, Bukidnon. The descriptive component was used to determine the levels of students' perceptions of mnemonic strategy use and self-reported learning, while the correlational component was utilized to determine whether a significant relationship existed between these variables.

### Participants

The participants of the study were all Grades 9 and 10 students enrolled at Sto. Domingo Integrated School. Total population sampling was employed because the accessible population was small and manageable. To maximize participation and obtain a broader representation of junior high school learners within the school, all students from both grade levels were included in the study. A total of 42 students participated, comprising 19 Grade 9 students and 23 Grade 10 students.

### Research Instrument

Data were collected using an adopted survey questionnaire consisting of two sections. The first section measured students' perceptions of teacher-implemented mnemonic strategies through 12 items adapted from Elsis (2023). The original instrument was developed to assess students' perceptions of mnemonic use in vocabulary learning. For the present study, the instrument was utilized to examine students' perceptions of mnemonic strategies as implemented by their Science teacher, particularly in learning and retaining scientific terms and concepts.

The second section measured self-reported learning in Science through seven items adapted from Stanley and Zhang (2018). Self-reported learning was used to assess students' perceptions of their understanding, engagement, and learning experiences in Science. It should be noted that self-reported learning reflects perceived learning and does not constitute a direct measure of academic achievement or actual learning performance.

Responses were recorded using a five-point Likert scale ranging from 1 (Strongly Disagree) to 5 (Strongly Agree). Negatively worded items were reverse-coded prior to analysis.

Prior to the conduct of the study, the instrument was pilot-tested among Grade 11 students to establish its reliability and suitability. Reliability analysis yielded a Cronbach's alpha coefficient of 0.844 for the mnemonic strategies scale and 0.870 for the self-reported learning scale, indicating good internal consistency.

### **Data Collection Procedure**

Approval to conduct the study was obtained from the school authorities and the Institutional Ethics Review Committee (IERC) of Central Mindanao University before data collection commenced. Parental consent and student assent were secured prior to the administration of the questionnaire.

Mnemonic strategies were incorporated into regular Science instruction to support students' learning and recall of scientific concepts. These strategies primarily involved the use of acronyms, initial-letter memory cues, and simple word associations designed to help learners remember scientific terms, classifications, sequences, and related concepts. The mnemonic techniques were integrated into classroom lessons as part of the teacher's regular instructional practices and were applied during activities that emphasized recall and retention of key Science concepts.

The survey was administered during regular class hours, and participants were informed about the purpose of the study, the voluntary nature of their participation, and the confidentiality of their responses. Completed questionnaires were collected, checked for completeness, encoded, and prepared for statistical analysis.

### **Data Analysis**

Descriptive statistics, specifically the mean and standard deviation, were used to determine the levels of students' perceptions of teacher-implemented mnemonic strategies and self-reported learning in Science. To examine the relationship between the two variables, the Pearson Product-Moment Correlation Coefficient (Pearson  $r$ ) was employed. All statistical analyses were conducted at the 0.05 level of significance.

### **Ethical Considerations**

The study adhered to the ethical guidelines of the Institutional Ethics Review Committee (IERC) of Central Mindanao University. Ethical clearance was obtained under CMU Control Number: 1080, s. 2026. Participation in the study was voluntary, and respondents were informed of their right to withdraw at any time without penalty. Parental consent and student assent were secured prior to data collection. Anonymity and confidentiality were maintained throughout the research process, and all data collected were used solely for academic purposes.

## **RESULTS AND DISCUSSION**

### **Perceptions of Teacher-Implemented Mnemonic Strategies**

Table 1. Mean Scores of Students' Perceptions of Teacher-Implemented Mnemonic Strategies

Indicators	Mean	SD	Descriptive Rating
The teacher should use mnemonics to introduce vocabulary for the first time.	4.19	0.740	High
The teacher should use mnemonics as a strategy to learn vocabulary.	4.05	1.035	High
Mnemonics should be used for reviewing the learned vocabulary.	4.02	1.000	High
It is easier for me to remember vocabulary using mnemonics.	4.02	0.950	High
Using mnemonics motivates me to learn new vocabulary.	3.88	0.739	High
Using mnemonics in learning vocabulary is fun.	3.76	0.906	High
I love the challenge of making up mnemonics on my own while learning vocabulary.	3.74	0.964	High
Using mnemonics enhances my long-term vocabulary learning.	3.95	0.825	High
I still remember words I used mnemonics to learn in previous semesters.	3.83	0.730	High
I find mnemonics confusing. (R)	3.52	0.862	High
Using mnemonics in the classroom wastes class time. (R)	4.00	0.796	High
Before an exam, I would prefer to use a mnemonics activity to review than a vocabulary list.	3.64	1.206	High
Overall Mean	3.88	0.557	High

Note. (R) = Reverse-coded item. Mean scores were interpreted as follows: 4.20-5.00 = Very High; 3.40-4.19 = High; 2.60-3.39 = Moderate; 1.80-2.59 = Low; 1.00-1.79 = Very Low.

Table 1 presents the students' perceptions of teacher-implemented mnemonic strategies in Science. The results revealed an overall mean of 3.88 (SD = 0.557), indicating favorable perceptions of mnemonic strategies. This suggests that students generally viewed mnemonic strategies as helpful in learning and retaining Science concepts.

The highest-rated indicator was "The teacher should use mnemonics to introduce vocabulary for the first time" (M = 4.19), followed by "The teacher should use mnemonics as a strategy to learn vocabulary" (M = 4.05) and "Mnemonics should be used for reviewing learned vocabulary" (M = 4.02). These findings suggest that students value mnemonic strategies for introducing and reinforcing scientific concepts, supporting the findings of Aracı, Melekoğlu, and Çetin (2023), who reported that mnemonic strategies facilitate information organization and recall.

Students also agreed that mnemonic strategies made vocabulary easier to remember (M = 4.02), enhanced long-term learning (M = 3.95), motivated them to learn new vocabulary (M = 3.88), and made learning enjoyable (M = 3.76). These findings are consistent with Putra and Abdullah (2021) and Babalola (2023), who highlighted the role of mnemonics in information retention and learner engagement. The use of acronyms, initial-letter memory cues, and word associations during instruction may have contributed to these positive perceptions.

The lowest-rated indicators were "I find mnemonics confusing" (M = 3.52), "Before an exam, I would prefer to use a mnemonics activity to review than a vocabulary list" (M = 3.64), and "I love the challenge of making up mnemonics on my own while learning vocabulary" (M = 3.74). Although these indicators remained within the

high category, the findings suggest that some students may be less confident in creating their own mnemonic devices or may still prefer traditional review methods.

The findings suggest that students perceive mnemonic strategies as valuable instructional tools that may support vocabulary acquisition, retention, and engagement in Science learning.

### Self-Reported Learning in Science

Table 2. Mean Scores of Students' Self-Reported Learning in Science

Indicators	Mean	SD	Descriptive Rating
The class allowed me to better understand concepts.	4.05	0.854	High
The class helped me understand the course material.	4.07	0.745	High
The class made it easy to connect ideas together.	3.71	0.995	High
The class helped me think more deeply about course material.	4.07	0.745	High
The class did not help my learning. (R)	4.14	0.872	High
The class did not make it easier for me to understand the course material. (R)	4.12	0.803	High
I was not able to better understand course concepts. (R)	4.10	0.790	High
Overall Mean	4.04	0.482	High

Note. (R) = Reverse-coded item. Mean scores were interpreted as follows: 4.20-5.00 = Very High; 3.40-4.19 = High; 2.60-3.39 = Moderate; 1.80-2.59 = Low; 1.00-1.79 = Very Low.

Table 2 presents the students' self-reported learning in Science. The results revealed an overall mean of 4.04 (SD = 0.482), indicating a high level of self-reported learning. This suggests that students generally perceived the Science lessons as contributing positively to their understanding of concepts, engagement with learning activities, and overall learning experiences.

Among the indicators, the highest-rated statement was the reverse-coded item "The class did not help my learning" (M = 4.14), followed by "The class did not make it easier for me to understand the course material" (M = 4.12) and "I was not able to better understand course concepts" (M = 4.10). After reverse scoring, these results indicate that students perceived the class as contributing positively to their learning and understanding of Science concepts.

Students also agreed that the class helped them understand the course material (M = 4.07), think more deeply about the lessons (M = 4.07), and better understand concepts (M = 4.05). These findings support the view that instructional approaches promoting active cognitive engagement are associated with students' perceived learning and conceptual understanding (Stanley & Zhang, 2018; Huang & Mayer, 2022). Moreover, students reported that the class made it easy to connect ideas together (M = 3.71), suggesting that they were able to relate new knowledge to previously learned concepts, an important aspect of meaningful learning.

It should be noted that self-reported learning reflects students' perceptions of their learning experiences rather than objective measures of academic achievement. Nevertheless, the findings indicate that students generally viewed their Science learning experiences positively and perceived classroom instruction as supportive of their understanding and engagement with scientific concepts.

## Relationship Between Perceptions of Teacher-Implemented Mnemonic Strategies and Self-Reported Learning in Science

Table 3. Correlation Between Students' Perceptions of Mnemonic Strategies and Self-Reported Learning in Science

Variables	Mean	SD	Pearson r	Sig. (2-tailed)	Interpretation
Perception of Mnemonic Strategies	3.8849	0.55733	—	—	High
Self-Reported Learning	4.0374	0.48168	—	—	High
Correlation Between Variables	—	—	0.564	< .001	Significant, Moderate Positive Relationship

Note. Correlation is significant at the 0.05 level (2-tailed).

Table 3 presents the relationship between students' perceptions of teacher-implemented mnemonic strategies and their self-reported learning in Science. The Pearson correlation analysis revealed a statistically significant positive relationship between the two variables ( $r = 0.564$ ,  $p < .001$ ). This indicates a moderate positive correlation, suggesting that students who reported more favorable perceptions of mnemonic strategies also tended to report higher levels of self-reported learning in Science.

The findings suggest that students who viewed mnemonic strategies as helpful, engaging, and effective also tended to report more positive perceptions of their understanding of concepts, ability to connect ideas, and overall learning experience. However, because the study employed a correlational design, the results do not establish a cause-and-effect relationship between perceptions of mnemonic strategies and self-reported learning. The findings indicate an association between the variables rather than evidence that mnemonic strategies directly improve learning outcomes.

The result is consistent with the findings of Huang and Mayer (2022), who emphasized that students' perceptions of instructional strategies influence their learning experiences and cognitive engagement. Similarly, Rodrigues, Wong, and King (2021) reported that positive perceptions of learning activities are associated with higher levels of perceived learning and engagement. These studies suggest that when students perceive instructional approaches as useful and supportive, they are more likely to report positive learning experiences.

Although the relationship was moderate rather than strong, the correlation coefficient suggests a meaningful association between the variables in the context of classroom learning. The findings indicate that students who held more positive perceptions of mnemonic strategies also tended to report more positive learning experiences. Nevertheless, self-reported learning reflects students' perceptions of their understanding and engagement and should not be interpreted as a direct measure of academic achievement or actual learning performance.

The findings should also be interpreted in light of the study's sample characteristics. The study involved only 42 students from a single rural secondary school, which may limit the generalizability of the results to other educational settings. While the findings provide useful preliminary insights into the relationship between students' perceptions of mnemonic strategies and their self-reported learning, caution should be exercised when extending the results to larger or more diverse student populations.

The results demonstrate that positive perceptions of teacher-implemented mnemonic strategies are associated with higher levels of self-reported learning in Science. These findings provide preliminary evidence that mnemonic techniques may be perceived by students as supportive of their learning experiences and warrant further investigation using objective measures of academic performance, larger samples, and experimental or quasi-experimental research designs.

## CONCLUSION

The study found that students demonstrated high perceptions of teacher-implemented mnemonic strategies and high levels of self-reported learning in Science. Students generally viewed mnemonic techniques as helpful for learning scientific terms and concepts, retaining information, and engaging with Science lessons. Likewise, students reported positive learning experiences, including a better understanding of concepts and the ability to connect ideas presented during instruction.

A moderate positive and statistically significant relationship was found between students' perceptions of mnemonic strategies and their self-reported learning in Science. This indicates that students who reported more favorable perceptions of mnemonic strategies also tended to report higher levels of self-reported learning. However, because the study employed a descriptive-correlational design, the findings do not establish a causal relationship between the variables.

Mnemonic strategies were generally perceived by students as valuable instructional tools that may support their learning experiences in Science classrooms. Nevertheless, self-reported learning reflects students' perceptions of their learning and should not be considered a direct measure of academic achievement or actual learning outcomes. Furthermore, the relatively small sample drawn from a single rural secondary school limits the generalizability of the findings and suggests that the results should be interpreted as context-specific rather than representative of all secondary school learners.

The study provides preliminary evidence that positive perceptions of teacher-implemented mnemonic strategies are associated with higher levels of self-reported learning in Science. Further research utilizing larger samples, multiple schools, objective measures of academic performance, and experimental or quasi-experimental research designs is recommended to better understand the role of mnemonic strategies in Science learning, particularly in rural educational settings.

## RECOMMENDATIONS

Based on the findings of the study, Science teachers are encouraged to continue integrating mnemonic strategies into classroom instruction to support students' understanding, retention, and recall of scientific concepts. The use of varied mnemonic techniques, such as acronyms, initial-letter memory cues, and word associations, may help learners engage more effectively with vocabulary-intensive and abstract Science topics.

School administrators may support the implementation of mnemonic-based instruction by providing professional development opportunities that enhance teachers' knowledge and skills in using memory-support strategies and other learner-centered approaches. Curriculum developers may also consider incorporating mnemonic-based activities and examples into instructional materials to promote meaningful learning.

Future researchers may investigate the relationship between mnemonic strategies and students' learning outcomes using objective measures such as achievement tests, concept recall assessments, or retention tests. Further studies involving larger samples, multiple schools, different grade levels, and diverse educational contexts are recommended to improve the generalizability of findings regarding mnemonic-based instruction in Science education. Researchers may also employ experimental or quasi-experimental research designs to examine the effects of mnemonic strategies on learning outcomes more rigorously.

Additionally, qualitative or mixed-methods studies may be conducted to explore students' experiences with specific mnemonic techniques and gain deeper insights into how these strategies support learning in Science classrooms. Future studies may also examine potential differences in students' perceptions of mnemonic strategies and self-reported learning across grade levels, gender, and other demographic characteristics to provide a more comprehensive understanding of mnemonic-based instruction in Science education.

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