INTERNATIONAL JOURNAL OF ADVANCED MULTIDISCIPLINARY STUDIES
Volume VI, Issue 1 January 2026, eISSN: 2799-0664

Metacognition, Learning Strategies, Motivation, and Problem-Solving Skills as Predictors of Science Achievement among Allied Medical Sciences Students

VERONICA S. ROQUE, MAEd
Unit Registrar/Faculty Member, Our Lady of Fatima University

MARLON B. MARVILLA, MAEd
Principal, Kalantiyaw Elementary School

FELICIANA JACOBA, EdD
Vice President for Academic Affairs, Nueva Ecija University of Science and Technology

CRISTO MARK D. ANCHETA, PhD
Professor V, Graduate School, Nueva Ecija University of Science and Technology

JANNEA LYN ESTARDO
Registrars' Staff, Our Lady of Fatima University

BRANDO C. PALOMAR, PhD
Graduate School, Philippine Normal University

Abstract — This study investigated the relationships among metacognition, learning strategies, learning motivation, problem-solving skills, and science achievement of Allied Medical Sciences students. Using a descriptive–correlational research design, data were collected from 281 students enrolled in nursing and allied health programs through validated instruments, including the Metacognitive Skills Scale, Revised Approaches to Studying Inventory, Science Motivation Questionnaire II, and a problem-solving skills scale. Pearson correlation analysis and structural equation modeling were employed to examine the relationships among variables. Results revealed a moderate positive correlation between metacognition and learning strategies ($r = 0.68$) and between metacognition and academic achievement ($r = 0.61$). Learning motivation demonstrated a moderate positive relationship with academic achievement ($r = 0.65$), while learning strategies and problem-solving skills showed negligible correlations with achievement. The findings suggest that metacognitive awareness and learning motivation are key predictors of science achievement among allied medical students. The study underscores the importance of integrating metacognitive and motivational strategies into instructional practices to enhance learning outcomes in health-related programs.

Keywords — Metacognition, Learning Strategies, Learning Motivation, Problem-Solving Skills, Science Achievement

I. Introduction

Science education plays a critical role in preparing students for evidence-based practice, particularly in allied medical and health-related programs. Learning sciences, as an interdisciplinary field, examine how students acquire, process, and apply knowledge across learning contexts (Sawyer, 2021). In health education, students are required not only to master scientific concepts but also to apply them in complex and dynamic real-world situations. Consequently, understanding the cognitive and motivational factors that influence students' academic performance is essential.

Among these factors, metacognition—commonly described as "thinking about one's thinking" (Flavell, 1979)—has been widely recognized as a critical component of effective learning. Metacognitive skills enable learners to plan, monitor, and evaluate their learning processes, leading to better comprehension, retention, and transfer of knowledge. Research has consistently shown that students with strong metacognitive awareness tend to demonstrate higher academic achievement and more effective learning behaviors.

In addition to metacognition, learning strategies, learning motivation, and problem-solving skills have been identified as important contributors to academic success. Learning strategies influence how students process information, motivation determines the extent of effort and persistence in learning tasks, and problem-solving skills support higher-order thinking and decision-making—skills that are indispensable in medical and allied health professions.

While previous studies have examined these variables independently or in paired relationships, limited research has explored their combined influence on science achievement, particularly among Allied Medical Sciences students in the Philippine context. Addressing this gap, the present study examines the interrelationships among metacognition, learning strategies, learning motivation, problem-solving skills, and academic achievement in science.

Review of Related Literature

Metacognition

Metacognition was first introduced by Flavell (1976) as an individual's awareness and regulation of cognitive processes. It encompasses three primary components: metacognitive knowledge, metacognitive regulation, and metacognitive accuracy. Metacognitive knowledge refers to learners' understanding of their cognitive abilities and strategies, regulation involves planning and monitoring learning activities, and accuracy reflects learners' ability to judge their performance realistically.

In educational contexts, metacognition has been associated with improved academic performance, self-regulated learning, and deeper conceptual understanding (Fleur et al., 2025). In science education, metacognitive skills support hypothesis formation, data analysis, and reflective reasoning, which are essential for scientific inquiry and professional practice.

Learning Strategies

Learning strategies refer to the methods and techniques learners use to acquire, organize, and apply information. According to educational research, learning strategies are commonly classified into surface, deep, and strategic approaches (UNSW Sydney, 2021). Surface learners focus on memorization and task completion, deep learners seek to understand underlying meanings, and strategic learners combine both approaches to optimize performance.

In health education, effective learning strategies are particularly important due to the volume and complexity of scientific content. Studies have shown that students who adopt deep and strategic learning approaches tend to achieve better academic outcomes and demonstrate greater long-term retention of knowledge (Minh Ton et al., 2025).

Learning Motivation

Learning motivation is a driving force that influences students' engagement, persistence, and academic performance. Motivation can be intrinsic, arising from personal interest and enjoyment, or extrinsic, driven by external rewards such as grades and career prospects. Eccles and Wigfield's expectancy-value theory highlights the role of motivation in determining students' learning choices and achievement outcomes.

In science education, motivated students are more likely to invest effort, use effective learning strategies, and persist in challenging tasks. Empirical evidence suggests a strong association between learning motivation and academic achievement, particularly in demanding fields such as medical and health sciences (Otermans et al., 2025).

Problem-Solving Skills

Problem-solving skills involve the ability to analyze situations, identify relevant information, generate solutions, and evaluate outcomes. These skills are central to scientific reasoning and clinical decision-making. While technological advancements have facilitated access to information, effective problem solving still requires critical thinking, logical reasoning, and reflective judgment.

Research indicates that although students may demonstrate proficiency in basic problem-solving tasks, they often struggle with evaluating assumptions and generating alternative solutions (Calma, 2025). Understanding how problem-solving skills relate to other learning variables and academic achievement remains an important area of inquiry.

Research Objectives and Questions

This study aimed to examine the relationships among metacognition, learning strategies, learning motivation, problem-solving skills, and science achievement of Allied Medical Sciences students.

Specifically, it sought to answer the following questions:

1. How may the profile of the respondents be described in terms of age, sex, and program?
2. How do respondents describe their learning strategies, learning motivation, and problem-solving skills?
3. Is there a significant relationship between metacognition and learning strategies, learning motivation, and problem-solving skills?
4. Is there a significant relationship between academic achievement and learning strategies, learning motivation, and problem-solving skills?
5. Is there a significant relationship between academic achievement and metacognition?

II. Methodology

Research Design

The study employed a descriptive–correlational research design to examine relationships among the selected variables without manipulating them.

Participants

The respondents consisted of 281 Allied Medical Sciences students enrolled in medical laboratory science, nursing, pharmacy, and related programs in Cabanatuan City. Purposive convenience sampling was used to select participants who were currently taking science-related courses.

Research Instruments

Data were collected using validated instruments:

- Metacognitive Skills Scale (MSS) to measure metacognitive knowledge, regulation, and accuracy
- Revised Approaches to Studying Inventory (RASI) to assess learning strategies
- Science Motivation Questionnaire II (SMQ-II) to measure learning motivation
- Problem-Solving Skills Scale to assess problem-solving attitude and critical thinking ability

Schematic Diagram of the Study

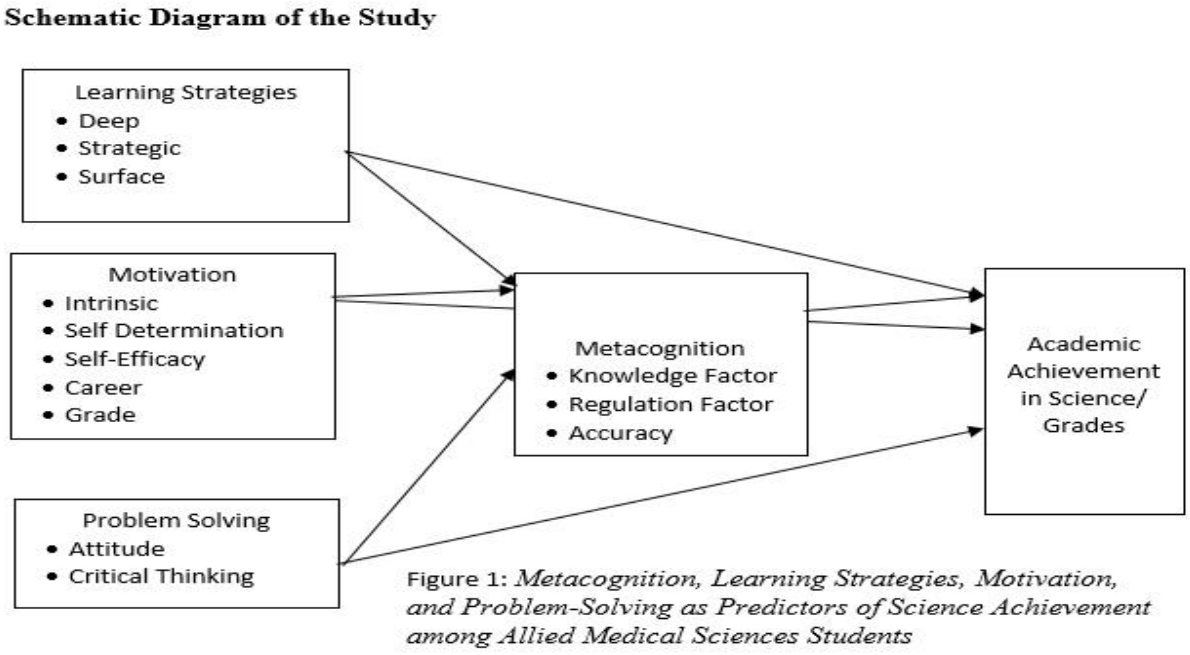

Figure 1: *Metacognition, Learning Strategies, Motivation, and Problem-Solving as Predictors of Science Achievement among Allied Medical Sciences Students*

Data Collection Procedure

Approval was obtained from the institutional research office prior to data collection. Questionnaires were administered online through Google Forms, and respondents were informed of the voluntary and confidential nature of participation.

Data Analysis

Data were analyzed using SPSS and AMOS. Descriptive statistics were used to summarize respondent profiles and variable levels, while Pearson correlation coefficients were computed to determine relationships among variables.

Ethical Considerations

The study adhered to ethical research standards, ensuring informed consent, confidentiality, anonymity, and voluntary participation.

III. Results and Discussion

Research Question 1. How may the profile of the respondents be described in terms of:

1.1. Sex
1.2. Age
1.3. Program

Table 1. Gender of the Participants

Sex	f	%
Male	87	30.96
Female	194	69.04
TOTAL	281	100.00

Table 2. Age of the Participants

Age	f	%
17	31	11.03
18	120	42.70
19	40	14.24
20	47	16.73
21	28	9.96
22	15	5.34
TOTAL	281	100.00

Table 3. Program of the Participants

Course	f	%
BSN	221	78.65
BSPH	18	6.40
BSMLS	42	14.95
TOTAL	281	100.00

Research Question 2. How may the respondents describe their:

2.1. learning strategies
2.2. learning motivation
2.3. problem-solving skills

Course	Weighted Average Mean Score	Standard Deviation
Learning Strategies	4.14	0.51
Learning Motivation	3.02	0.67
Problem Solving Skills	3.75	0.49

Research Question 3. Is there a significant relationship between the metacognition of the respondents and their:

3.1. learning strategies
3.2. learning motivation
3.3. problem-solving skills

Course	Pearson Moment Correlation Coefficient (r)	Interpretation
Learning Strategies	0.68	Moderate Positive Correlation
Learning Motivation	-0.68	Very Weak Negative Correlation
Problem Solving Skills	0.04	Very Weak Negative Correlation

Research Question 4. Is there a significant relationship between the academic achievements of the respondents and their:

4.1. learning strategies
4.2. learning motivation
4.3. problem-solving skills

Course	Pearson Moment Correlation Coefficient (r)	Interpretation
Learning Strategies	-0.05	Very Weak Negative Correlation
Learning Motivation	-0.65	Moderate Positive Correlation
Problem Solving Skills	-0.08	Very Weak Negative Correlation

Research Question 5. Is there a significant relationship between the academic achievements and metacognition of the respondents?

Course	Pearson Moment Correlation Coefficient (r)	Interpretation
t-statistic	-0.61	Moderate Positive Correlation

Data Collection Procedure

The profile of the respondents shows that the majority were female, comprising 194 or 69.04% of the total 281 participants, while males accounted for 87 or 30.96%. This indicates a

female-dominated sample. In terms of age, most respondents were 18 years old, representing 42.70% of the total, followed by those aged 20 (16.73%) and 19 (14.24%). Smaller proportions were aged 17 (11.03%), 21 (9.96%), and 22 (5.34%). With respect to course enrollment, a substantial majority were Bachelor of Science in Nursing (BSN) students at 78.65%, while 14.95% were enrolled in BSMLS and 6.40% in BSPH. These findings suggest that the respondents were predominantly young, female, and enrolled in nursing-related programs.

Regarding the respondents' self-assessment of learning-related variables, the findings reveal that learning strategies were rated high, with a weighted average of 4.14 and a standard deviation of 0.51, indicating that respondents frequently employed effective learning strategies and showed relatively consistent responses. Learning motivation obtained a moderate weighted average of 3.02 with a standard deviation of 0.67, suggesting an average level of motivation with some variability among respondents.

Meanwhile, problem-solving skills were rated high, as reflected by a weighted average of 3.75 and a standard deviation of 0.49, indicating that respondents generally perceived themselves as competent in solving academic problems.

The relationship between metacognition and the selected learning variables yielded varying results. A moderate positive correlation was found between metacognition and learning strategies ($r = 0.68$), indicating that respondents with higher metacognitive awareness tended to employ more effective learning strategies. This suggests that students who are more aware of their thinking processes are better able to plan, monitor, and evaluate their learning. In contrast, metacognition showed a very weak negative correlation with learning motivation ($r = -0.08$) and problem-solving skills ($r = -0.04$), implying that metacognitive awareness had little to no meaningful relationship with these variables in this study.

In terms of academic achievement, the results show differing patterns of association. Academic achievement demonstrated a very weak negative correlation with learning strategies ($r = -0.05$) and problem-solving skills ($r = -0.08$), indicating that these variables had minimal influence on the academic performance of the respondents. However, a moderate positive correlation was observed between academic achievement and learning motivation ($r = 0.65$), suggesting that students who were more motivated tended to achieve better academic outcomes. This highlights the important role of motivation in influencing students' academic success.

Finally, the relationship between academic achievement and metacognition revealed a moderate positive correlation ($r = 0.61$). This finding indicates that higher levels of metacognitive awareness are associated with better academic achievement. It suggests that students who are more conscious of their cognitive processes and learning strategies may be more capable of regulating their learning, leading to improved academic performance. Overall, the results emphasize the significance of metacognition and learning motivation as important factors related to academic achievement among the respondents.

IV. Conclusion

Based on the findings of the study, it can be concluded that the respondents were predominantly young, female students, most of whom were enrolled in the Bachelor of Science in Nursing program. The respondents generally demonstrated high levels of learning strategies and problem-solving skills, while their learning motivation was found to be at a moderate level. These results suggest that the students possess adequate learning competencies, although motivation varies among individuals.

The study further revealed that metacognition plays an important role in learning, as evidenced by its moderate positive relationship with learning strategies and academic achievement. This indicates that students who are more aware of and able to regulate their cognitive processes tend to apply more effective learning strategies and achieve better academic performance. In contrast, metacognition showed minimal relationship with learning motivation and problem-solving skills.

Moreover, academic achievement was found to be moderately associated with learning motivation, highlighting motivation as a key factor influencing students' academic success. Other learning-related variables, such as learning strategies and problem-solving skills, showed very weak relationships with academic achievement, suggesting that these factors alone may not directly translate into higher academic performance.

The findings indicate that metacognition plays a significant role in shaping students' learning strategies and academic achievement. Students with higher metacognitive awareness were more likely to employ effective learning strategies and achieve better academic outcomes, supporting previous research on self-regulated learning.

Learning motivation emerged as a strong predictor of academic achievement, highlighting its importance in sustaining effort and engagement in science-related programs. In contrast, learning strategies and problem-solving skills showed weak direct relationships with achievement, suggesting that their impact may be mediated by other factors such as motivation and metacognitive regulation.

Overall, the findings underscore the importance of enhancing students' metacognitive awareness and learning motivation to support better academic outcomes. Educational interventions and teaching strategies that foster self-regulation, reflection, and motivation may help improve students' academic achievement and overall learning experience.

V. Recommendations

Based on the findings and conclusions of the study, the following recommendations are proposed:

First, educational institutions and instructors may develop and implement instructional

strategies that enhance students' metacognitive skills, such as reflective learning activities, self-assessment tasks, and guided questioning. Strengthening metacognitive awareness can help students better plan, monitor, and evaluate their own learning, which may lead to improved academic achievement.

Second, since learning motivation showed a moderate positive relationship with academic achievement, teachers are encouraged to use motivational strategies in the classroom. These may include setting clear learning goals, providing timely and constructive feedback, incorporating interactive and student-centered activities, and recognizing students' efforts and achievements to sustain and improve motivation.

Third, academic support programs such as study skills workshops, mentoring, and counseling services may be offered to help students enhance their learning strategies and problem-solving skills. Although these variables showed weak relationships with academic achievement, they remain essential components of effective learning and may indirectly support students' academic performance.

Fourth, curriculum planners and program administrators may consider integrating metacognitive and motivational components into course designs, particularly in health-related programs such as nursing and medical laboratory sciences. This integration can help students become more self-regulated and motivated learners.

Finally, future researchers are encouraged to conduct similar studies using a larger and more diverse sample and to include additional variables that may influence academic achievement. Longitudinal or experimental research designs may also be employed to further examine the causal relationships among metacognition, learning motivation, learning strategies, and academic performance.

REFERENCES

[1] BAhmad, S. et.al., 2026. Structural equation modeling for causal effect estimation with machine learning. Journal of computational and Applied Mathematics, Volume 475, March 2026. Elsevier. https://doi.org/10.1016/j.cam.2025.117020.
[2] Altindag, M., and N. Senemoglu (2013), Metacognitive Skills Scale, Hacettepe Universitesi Egitim Fakultesi Dergisi [H.U. Journal of Education].
[3] Calma, A. (2025). Students' problem-solving skills in depth: ready for "real life"?. The International Journal of Management Education, Volume 23, Issue 3, December 2025. Elsevier. https://doi.org/10.1016/j.ijme.2025.101267.
[4] Claudio, S. et.al., 2025, Innovative teaching methodologies: Keyword-based analysis to monitor the trends of the last decade, Procedia Computer Science, volume 253, Elsevier, Department of Engineering for Industrial Systems and Technologies, University of Parma, Parco Area delle Scienze, 181/A, 43124 Parma (Italy), https://doi.org/10.1016/j.procs.2025.01.283.
[5] Corte, et.al., (2021). Enhancing The Learning Proficiency of Students in Higher Education, Forum on Public Policy

[6] Cross, D. R. & Paris, S. G. (1988). Developmental and instructional analyses of children's metacognition and reading comprehension. Journal of Educational Psychology, 80(2), 131-142.
[7] Culatta, R., (2021), InstructionalDesign.org. Learning Concepts. Learning Strategies.
[8] Danley, K.N. (2021). What is proficiency based learning?, Teach Hub.com, K-12 Resources by Teachers, For Teachers, https://www.teachhub.com/teaching-strategies/2021/03/what-is-proficiency-based-learning/
[9] Eccles & Wigfield, (2020). J.S. Eccles, A. Wigfield. From expectancy-value theory to situated expectancy-value theory: A developmental, social cognitive, and sociocultural perspective on motivation. Contemporary Educational Psychology, 101859 (2020), 10.1016/j.cedpsych.2020.101859.
[10] Fekete, Z. et.al., 2025. Adverse childhood experiences and adult trait anxiety: The mediating role of metacognition. Journal of Psychiatric Research Volume 189, September 2025. https://doi.org/10.1016/j.jpsychires.2025.07.027.
[11] Fleur, D.S. et.al., (2025). Neural correlates of metacognition in education: a machine learning approach. Neuropsychologia. Volume 219, December 15, 2025. Elservier. https://doi.org/10.1016/j.neuropsychologia.2025.109265.
[12] Flavell, J. H. (1976). Metacognitive aspects of problem solving. In L. B. Resnick (Ed.), The nature of intelligence (pp.231-236). Hillsdale, NJ: Erlbaum
[13] Flavell, J. H. (1979). Metacognition and cognitive monitoring: A new area of cognitive developmental inquiry. American Psychologist, 34(10), 906-911.
[14] Guiner, P. et.al., (2021). Metacognitive Skills and Problem-Solving. International Journal of Research in Education and Science 7(3):715-734. DOI:10.46328/ijres.1594.
[15] Hartman, H.J. (2002b). Teaching Metacognitively. In Hartman, H.J. (Ed.).
[16] Metacognition in Learning and Instruction. Theory, Research and Practice. Netherlands: Kluwer Academic Publishers.
[17] Hayre, R.K. et.al., (2026), The developmental trajectories of implicit and explicit metacognitive monitoring and control in cued recall. Journal of Experimental Child Psychology. Volume 262, February 2026. Elsevier. https://doi.org/10.1016/j.jecp.2025.106367.
[18] Hemler, M.E., (2025). Child welfare inequalities in an egalitarian nation: A
[19] Norweigian Cohort Study. Children and Youth Services Review, Volume 175. Elsevier. https://doi.org/10.1016/j.childyouth.2025.108372.
[20] Hermans, F. et.al., (2025). Dynamic modulation of confidence based on metacognitive skills of collaborators. Cognition. Volume 261. August 2025. Elsevier. https://doi.org/10.1016/j.cognition.2025.106151.
[21] Herz, M., et.al., (2026). Demands, resources, burnout, and work ability in long-termcare: A multi-group structural equation model comparing residential and home care. International Journal of Nursing Studies. Volume 173, January 2026. Elsevier. https://doi.org/10.1016/j.ijnurstu.2025.105255.
[22] La Marca, A. (2014), The Development of a Questionnaire on Metacognition for Students in Secondary School, Universita Di Palermo, Italy, https://core.ac.uk/download/pdf/53295350.pdf.
[23] Lee, H.R. et.al., (2025). Exploring domain-general and course-specific latent profiles of motivation in computer science. Learning and Individual Differences. Volume 120, May 2025. Elsevier. https://doi.org/10.1016/j.lindif.2025.102686.

[24] Loginov, A. (2025). Digital metacognition: Awareness, regulation, and analysis of thinking in digital environments. Next Research, Volume 2, Issue 4, December 2025. https://doi.org/10.1016/j.nexres.2025.100770.
[25] Mahpour, A. et.al., (2025), From Interest to action: Analyzing the mediating and moderating factors in online shopping behavior using a structural equation modeling approach. Telematics and Informatics Reports. Volume 20, December 2025. Elsevier. https://doi.org/10.1016/j.teler.2025.100261.
[26] Minh Ton, D.N. et.al., 2025. Learning strategies of nursing students and correlation with study habit and academic performance. Teaching and Learning in Nursing. Volume 20, Issue 4, October 2025. Elsevier. https://doi.org/10.1016/j.teln.2025.04.013.
[27] Ministry of Education (2014), Curriculum and Resources Tools, from TKI retrieved January 28, 2014, http://efs.tki.org.nz/Curriculum-resources-and-tools/The- Cooperative-Learning-Grid
[28] Mondal, P. (2021) Importance of Motivation in Learning (657 Words), https://www.yourarticlelibrary.com/motivation/importance-of-motivation-in-learning-657-words/5998
[29] Otermans, P.C. J. et.al., (2025). Motivation is key: exploring the role of motivation on learning approaches. Learning Research and Practice. July 16, 2025. https://doi.org/10.1080/23735082.2025.2536502.
[30] Ozturk, N. (2017), Assessing Metacognition: Theory and Practices, IJATE International Journal of Assessment Tools in Education,
[31] https://doi.org/10.21449/ijate.298299.
[32] Quian, J. (2025). The relationship between parental investment and high school students' academic achievement: The mediating role of academic emotions and the moderating role of learning motivation. Acta Pscyhologica. Volume 259, September 2025. Elservier. https://doi.org/10.1016/j.actpsy.2025.105364.
[33] Roque, V.S. and E.C. Trinidad (2013), Application of "Color Your DNA" Activity and Flash Games as a Teaching Tool in Cytogenetics to Enhance Teaching and Learning in the Classroom
[34] Salandanan Gloria G. (2009). Teacher Education. Quezon City: Katha Publishing Co., Inc.
[35] Schaathun, H.G., 2025, On the common core of science and design, Design Studies, Volume 98, Elsevier, Norweigian University of Science and Technology, Dept. ICT and Natural Sciences, Larsgårdsvegen 2, Postboks 1517, N-6025, Ålesund, Norway, https://doi.org/10.1016/j.destud.2025.101305.
[36] Wright T.S. et.al., 2026. Supporting teachers to enact science talk in early elementary classrooms: The role of professional learning and curriculum. Early Childhood Research Quarterly, Volume 74, 1st Quarter 2026. Elsevier. https://doi.org/10.1016/j.ecresq.2025.09.005.
[37] Xie, H. et.al., (2025). Metacognition and translation competence: A Three-Level, Meta-analytic Study. Acta Psychologica, Volume 260, Elsevier. https://doi.org/10.1016/j.actpsy.2025.105722.
[38] Yee Mok, S. et.al., (2024). Elementary school students' metacognitive knowledge and its effects on teacher judgments, school tract recommendations, and school transitions. Learning and Individual Differences, Volume 112, May 2024. Elsevier. https://doi.org/10.1016/j.lindif.2024.102456.

[39] Yelgeç, N. & Dağyar, M. (2020). A structural equation modelling of middle school students' metacognitive awareness, self-efficacy beliefs and foreign language learning anxiety. International Journal of Contemporary Educational Research, 7(1), 127-148. DOI: https://doi.org/10.33200/ijcer.657172.
[40] Zohar, A. (2025). Improving the balance between theory and practice: New insights from professional development courses about teaching thinking and metacognition. Teaching and Teacher Education. Volume 165. October 2025. Elsevier. https://doi.org/10.1016/j.tate.2025.105178.

Internet Resources

[41] http://www.mindtools.com/memory.html (2011).
[42] http://peoplelearn.homestead.com/BEduc/Chapter_5.pdf. (2011).
[43] http://www.pmemory.com/student-area/GMS_Manual/What_is_GMS.htmCOPYRIGHT 2008 Council for Learning Disabilities. This material is published under license from the publisher through the Gale Group, Farmington Hills, Michigan. All inquiries regarding rights or concerns about this content should be directed to Customer Service.. (2011).
[44] www.yourgenome.org/downloads/pdf/.../seq/FT_sequence_bracelets.pdf.
[45] cibt.bio.cornell.edu/labs_and_activities/images/LegoLab.pdf.
[46] http://nwrpdp.com/documents/RPDP_Forms/RPDP%20Standard%20Evaluatio%2010-11.pdf.
[47] http://www.nature.com/scitable/topicpage/introduction-what-is-dna-6579978.
[48] http://www.click4it.org/images/a/a8/Graham.pdf.
[49] http://teach.com/what/teachers-teach/learning-styles.
[50] http://people.umass.edu/florence/meta.pdf.
[51] http://www.ijese.net/makale_indir/713.
[52] https://files.eric.ed.gov/fulltext/EJ1016118.pdf.
[53] http://davidmlane.com/hyperstat/A63407.html.
[54] http://www.deped.gov.ph/wp-content/uploads/2015/04/DO_s2015_08.pdf
[55] http://www.brain-mappers.com/mnemonics/index.html
[56] https://blog.innerdrive.co.uk/eight-ways-to-develop-metacognitive-skills
[57] https://www.cnn.ph/news/2020/12/10/PH-Grade-4-students-worst-in-math-and-science-proficiency--study-.html
[58] https://www.apa.org/science/about/psa/2018/06/motivation
[59] https://www.the-learning-agency-lab.com/learning-strategies.html
[60] https://news.harvard.edu/gazette/story/2019/09/study-shows-that-students-learn-more-when-taking-part-in-classrooms-that-employ-active-learning-strategies/
[61] https://www.oecd.org/site/educeri21st/40554221.pdf
[62] https://www.digitalvidya.com/blog/structural-equation-modeling/
[63] https://www.courses.com.ph/senior-high-school-in-the-philippines-an-overview/
[64] https://www.kqed.org/mindshift/46038/the-role-of-metacognition-in-learning-and-achievement
[65] https://www.futurelearn.com/info/courses/learning-teaching-university/0/steps/26384
[66] https://byjus.com/maths/standard-deviation/