

Metacognition for Autonomous Learning Within Sociocultural Context: An Explanatory Sequential Study of Grade 5 Pupils in a Specialized Reading Class

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ABSTRACT

This explanatory sequential mixed-methods study examined the relationship between metacognitive ability and autonomous learning among exceptional Grade 5 pupils in a specialized reading class within a sociocultural classroom context. The study determined pupils' levels of metacognitive knowledge, metacognitive regulation, critical thinking, decision making, and problem solving; tested the relationship between metacognitive ability and autonomous learning; explored classroom and learner-based explanations for the quantitative results; and developed evidence-based reading strategies assessed by teachers for acceptability. In the quantitative phase, 41 exceptional Grade 5 pupils from Isabelo Delos Reyes Elementary School during school year 2025-2026 completed performance-based reading tasks using literary and scientific texts with PISA-aligned open-ended questions.

Responses were scored using validated researcher-made rubrics and analyzed through descriptive statistics and Spearman's rho. In the qualitative phase, focus group discussions were thematically analyzed to explain the statistical relationship. Findings showed evident metacognitive knowledge ($M = 4.17$), metacognitive regulation ($M = 4.13$), and overall metacognitive ability ($M = 4.15$). Pupils also demonstrated evident autonomous learning in critical thinking ($M = 4.19$), decision making ($M = 4.14$), problem solving ($M = 4.15$), and overall autonomous learning ($M = 4.16$). Spearman's rho revealed a significant positive relationship between metacognitive ability and autonomous learning ($\rho = 0.692$, $p < .001$). Qualitative findings explained this relationship through a dual pathway in which teacher scaffolding, peer support, and independent problem solving gradually moved pupils from socially guided learning toward self-regulation. Teachers rated the proposed reading strategies as highly acceptable in practicality, relevance, and potential effectiveness. The study concludes that metacognition and autonomous learning are mutually reinforcing and that structured, scaffolded, and reflective reading strategies can strengthen pupils' independent learning capabilities.

Keywords: *metacognitive ability, autonomous learning, sociocultural context, explanatory sequential design, reading strategies, Grade 5 pupils*

INTRODUCTION

Reading comprehension in the elementary grades requires more than the ability to decode words. It involves strategic meaning making, self-monitoring, evaluation of understanding, and the flexible use of cognitive strategies. In the Philippine context, reading comprehension remains a continuing concern, as national and international assessments have reported persistent difficulty among Filipino learners in understanding and evaluating texts (Chi, 2024; Idulog et al., 2023; Servillos, 2023). These challenges highlight the need to strengthen reading instruction by

developing not only comprehension skills but also learners' ability to think about, regulate, and direct their own learning.

Metacognition is central to this concern because it allows learners to become aware of their thinking processes and to regulate how they approach academic tasks. Flavell's theory identifies metacognitive knowledge and metacognitive regulation as essential components of effective learning, while Zimmerman's self-regulated learning theory explains how learners plan, monitor, and reflect on their performance. Vygotsky's sociocultural theory further emphasizes that these abilities develop through guided interaction, scaffolding, and classroom support before being internalized as independent learning behaviors (Flavell, 1979; Vygotsky, 1978; Zimmerman, 2002).

Developing metacognitive and autonomous learning skills is especially important among Grade 5 pupils who are transitioning from foundational reading toward more complex, subject-based texts. In a specialized reading class, exceptional pupils encounter literary and scientific texts that require interpretation, problem solving, and higher-order thinking. However, much of the research on metacognition and autonomous learning has focused on older learners, leaving a gap in understanding how these skills operate among advanced elementary pupils. This study addressed that gap by using performance-based reading tasks and qualitative classroom evidence to examine how metacognition supports autonomous learning within a sociocultural learning environment.

The study aimed to determine the levels of metacognitive ability and autonomous learning among exceptional Grade 5 pupils, establish the relationship between these variables, explain the relationship through the pupils' sociocultural classroom experiences, and develop reading strategies that foster metacognition and autonomous learning.

Literature Review

Metacognition and reading development

Metacognition refers to awareness and control of one's cognitive processes. In reading, it enables learners to plan strategies, monitor comprehension, and evaluate whether selected approaches are effective. Studies emphasize that metacognition contributes to reading comprehension, problem solving, and academic performance because learners who can reflect on their thinking are more capable of adjusting their strategies when tasks become difficult (Güner & Erbay, 2021; Moir et al., 2020; Stanton et al., 2021).

Metacognitive knowledge involves knowing one's strengths, weaknesses, task demands, and possible learning strategies. Longitudinal evidence shows that metacognitive knowledge is associated with vocabulary, reading, and writing development among children, indicating that learners who develop early awareness of how they learn tend to improve more consistently in literacy-related skills (Teng, 2022; Teng & Zhang, 2021). Metacognitive regulation, on the other hand, involves planning, monitoring, and evaluating learning actions. It supports learners in controlling their performance, correcting errors, and sustaining motivation (Zheng et al., 2021).

Autonomous learning and higher-order thinking

Autonomous learning refers to learners' ability to take responsibility for their own learning. In this study, autonomy was operationalized through critical thinking, decision making, and problem solving in performance-based reading tasks. Autonomous learners are able to analyze information, make reasoned choices, and evaluate solutions with minimal teacher direction. These abilities are aligned with the broader goal of developing self-directed learners who can adapt to complex academic tasks (Marantika, 2021; Paethrangsi et al., 2024).

Critical thinking and problem solving are closely connected to reading comprehension. Learners who analyze, infer, evaluate, and synthesize information are better able to understand literary and scientific texts (Hidayati et al., 2020). Reading interventions that integrate metacognitive strategies, self-regulation, and reflective practice have been found to improve critical reading skills and learner autonomy (Arini & Sulistyarini, 2021; Sirimangkalavanit & Vanichwatanavorachai, 2023).

Sociocultural support and scaffolded learning

From a sociocultural perspective, metacognitive development does not occur in isolation. Learners first encounter strategies through teacher modeling, peer interaction, and guided classroom activities before they internalize these strategies as independent habits. Scaffolding, shared regulation, and collaborative learning experiences provide learners with opportunities to ask questions, compare ideas, and refine strategies in a supportive environment (De Backer et al., 2022; McMullen, 2020).

In specialized reading contexts, scaffolded instruction is particularly important because advanced pupils may possess strong literacy skills but still require support in transferring strategies across disciplines and task types. The literature suggests that reading programs should integrate explicit strategy instruction, reflective questioning, and opportunities for independent application so learners can move from guided practice to autonomous performance (Villegas, 2024).

METHODS

Research Design

The study used an explanatory sequential mixed-methods design. The quantitative phase employed a correlational approach to determine the relationship between pupils' metacognitive ability and autonomous learning. The qualitative phase used focus group discussions to explain the quantitative findings by examining pupils' individual learning processes and sociocultural classroom experiences.

Research Locale

The study was conducted at Isabelo Delos Reyes Elementary School in Tondo, Manila during the school year 2025-2026. The school provided a structured learning environment with specialized reading instruction for academically advanced Grade 5 pupils.

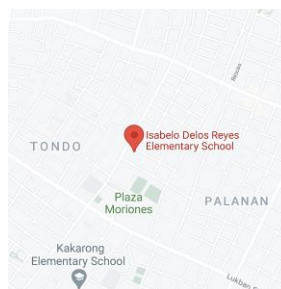


Figure 1. Map showing the location of Isabelo Delos Reyes Elementary School in Tondo, Manila.

Participants and Sampling Technique

The participants were 41 exceptional Grade 5 pupils from a specialized reading class and the Grade 5 reading teachers who assessed the acceptability of the proposed reading strategies. The term exceptional referred to academically advanced pupils with high reading proficiency and did not refer to pupils with special education needs. Purposive sampling was used because the study required participants who were directly involved in advanced reading instruction.

Research Instrument

The primary instruments were performance-based reading tasks, researcher-made rubrics, a focus group discussion protocol, and a teacher acceptability survey. The reading tasks used literary texts, including a poem and short story, and scientific texts involving mathematical problem solving, physics application, and ecology application. Open-ended questions were aligned with PISA-type reading processes and were designed to elicit metacognitive knowledge, metacognitive regulation, critical thinking, decision making, and problem solving. The

rubrics used a five-point scale from Not Evident to Highly Evident, while the teacher survey assessed practicality, relevance, and potential effectiveness.

Validity and Reliability

The instruments underwent expert validation by reading education specialists and a statistician to establish clarity, age appropriateness, and alignment with the theoretical constructs. The revised instruments were pilot-tested with Grade 5 pupils who were not part of the main study. Inter-rater reliability was established by having the researcher and an independent rater score selected responses using the rubrics, after which rubric descriptors were refined to promote scoring consistency.

Data Gathering Procedure

The researcher secured permission from school authorities and obtained parental consent and pupil assent before data collection. In the quantitative phase, pupils completed the performance-based reading tasks individually in a quiet setting. Their open-ended responses were transcribed and scored using the validated rubrics. In the qualitative phase, focus group discussions were conducted with pupils to explore how they approached the tasks, what challenges they encountered, and how teacher and peer interactions shaped their learning. The synthesized findings were then used to develop reading strategies, which were evaluated by teachers for acceptability.

Data Analysis

Descriptive statistics, including mean and standard deviation, were used to determine the levels of metacognitive ability, autonomous learning, and teacher acceptability. Spearman's rho was used to determine the relationship between metacognitive ability and autonomous learning at the 0.05 level of significance. Qualitative data from the focus group discussions were analyzed thematically to identify meaning units, codes, categories, and explanatory themes.

Ethical Consideration

The study followed ethical guidelines for research with children. Participation was voluntary, parental consent and pupil assent were secured, and participants were informed of their right to withdraw. Confidentiality and anonymity were maintained by using codes instead of names. All data were securely stored and used only for academic purposes. Tasks and discussions were conducted in a supportive, age-appropriate, and non-judgmental environment.

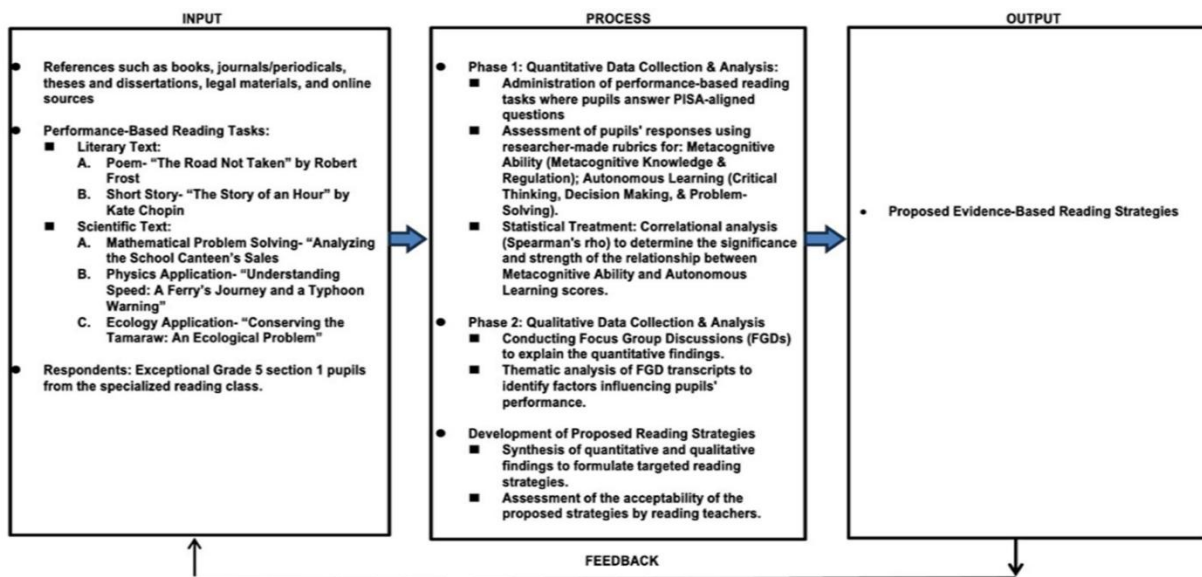


Figure 2. Conceptual framework of the study.

RESULTS AND DISCUSSION

Level of metacognitive ability

The pupils demonstrated evident levels of both metacognitive knowledge and metacognitive regulation. Metacognitive knowledge obtained an overall mean of 4.17, while metacognitive regulation obtained an overall mean of 4.13. Combined, the pupils' overall metacognitive ability reached a mean of 4.15, interpreted as Evident. These findings indicate that pupils were generally able to recognize their thinking processes and regulate their strategies during reading and problem-solving tasks.

Table 1. *Level of Metacognitive Ability of Pupils*

Dimension / Task	Mean	SD	VI
Metacognitive Knowledge - Literary Text (Poem)	4.10	0.831	E
Metacognitive Knowledge - Literary Text (Short Story)	4.20	0.954	E
Metacognitive Knowledge - Mathematical Problem Solving	4.00	0.775	E
Metacognitive Knowledge - Physics Application	4.44	0.673	HE
Metacognitive Knowledge - Ecology Application	4.12	0.812	E
Overall Metacognitive Knowledge	4.17	0.373	E
Overall Metacognitive Regulation	4.13	0.381	E
Overall Metacognitive Ability	4.15	0.363	E

Legend: HE = Highly Evident; E = Evident.

The highest scores appeared in physics-related scientific tasks, suggesting that contextualized and concept-driven texts can stimulate planning, monitoring, and evaluation. The lower scores in mathematical problem solving, though still evident, imply that abstract or multi-step tasks may require stronger support for strategy adjustment. This pattern is consistent with literature showing that metacognitive regulation supports problem solving, but learners may still struggle when tasks demand flexible strategy use (Güner & Erbay, 2021; Zheng et al., 2021).

Level of autonomous learning

The pupils also demonstrated evident autonomous learning. Critical thinking obtained the highest mean ($M = 4.19$), followed by problem solving ($M = 4.15$) and decision making ($M = 4.14$). The overall autonomous learning mean was 4.16, interpreted as Evident. These results show that pupils could analyze information, make reasoned choices, and manage learning tasks with limited teacher support.

Table 2. *Level of Autonomous Learning of Pupils*

Dimension / Task	Mean	SD	VI
Critical Thinking - Literary Text (Poem)	4.12	0.954	E

Critical Thinking - Literary Text (Short Story)	4.15	0.963	E
Critical Thinking - Mathematical Problem Solving	4.51	0.597	HE
Overall Critical Thinking	4.19	0.371	E
Overall Decision Making	4.14	0.393	E
Overall Problem Solving	4.15	0.431	E
Overall Autonomous Learning	4.16	0.354	E

Legend: HE = Highly Evident; E = Evident.

The highest critical thinking score was observed in mathematical problem solving, while problem solving and decision making were strongest in short-story tasks. This suggests that different task types elicit different aspects of autonomy: mathematical tasks can strengthen analytical reasoning, while literary tasks can develop interpretation, judgment, and solution generation. These findings support the view that critical reading and higher-order thinking are connected to reading comprehension and autonomous learning (Arini & Sulistyarini, 2021; Hidayati et al., 2020).

Relationship between metacognitive ability and autonomous learning

Table 3. *Significant Relationship Between Metacognitive Ability and Autonomous Learning*

Relationship	Spearman's rho	p-value	Result
Metacognitive Knowledge and Critical Thinking	0.631	< .001	Significant
Metacognitive Regulation and Critical Thinking	0.726	< .001	Significant
Metacognitive Knowledge and Decision Making	0.634	< .001	Significant
Metacognitive Regulation and Decision Making	0.723	< .001	Significant
Metacognitive Knowledge and Problem Solving	0.433	0.005	Significant
Metacognitive Regulation and Problem Solving	0.489	0.001	Significant
Metacognitive Ability and Autonomous Learning	0.692	< .001	Significant

Note: Correlations were tested at the 0.05 level of significance.

Spearman's rho revealed a significant positive relationship between metacognitive ability and autonomous learning ($\rho = 0.692$, $p < .001$). This means that pupils who showed stronger awareness and regulation of their thinking also demonstrated stronger critical thinking, decision making, and problem-solving behaviors. The null hypothesis was rejected. The result supports the theoretical assumption that metacognitive knowledge and regulation help learners become self-directed and strategic in academic tasks (Flavell, 1979; Marantika, 2021; Zimmerman, 2002).

Sociocultural explanation of the quantitative relationship

The qualitative findings explained the quantitative relationship through two learning pathways. First, pupils demonstrated an internal locus of knowledge when they described solving problems independently, checking their answers, and avoiding unnecessary comparison with others. Second, pupils identified external sources of knowledge when they emphasized teacher support, peer assistance, and a classroom atmosphere where asking questions was comfortable. These findings show that the pupils' autonomy developed through a gradual movement from guided support to self-regulated learning.

Table 4. *Qualitative Themes Explaining the Metacognition-Autonomy Relationship*

Meaning Unit	Code	Category	Cluster
Teacher gave time to solve the problem independently	Learning on their own	Internal locus of knowledge	Locus of knowledge and self-regulated learning
Preferring not to compare one's thinking with others	Learning on their own	Internal locus of knowledge	Locus of knowledge and self-regulated learning
Feeling comfortable asking questions	Learning from others	External source of knowledge	Locus of knowledge and self-regulated learning
Receiving help through peer interaction	Learning from others	External source of knowledge	Locus of knowledge and self-regulated learning

Note: Themes were derived from the focus group discussion data.

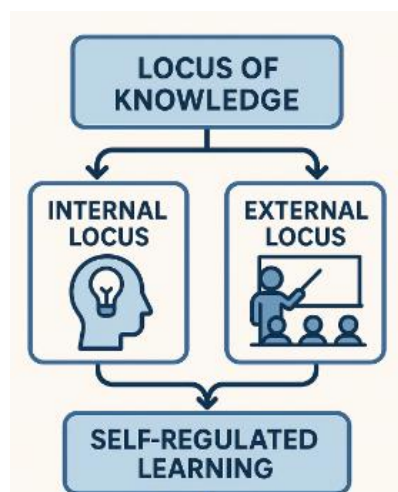


Figure 3. *The Locus of Knowledge and Self-Regulated Learning: A Contextual Model.*

This model illustrates that autonomous learning does not emerge from isolation alone. Rather, it develops when external scaffolding from teachers and peers is gradually internalized by the learner. This confirms Vygotsky's view that learning begins in social interaction before becoming self-directed regulation (Vygotsky, 1978).

Reading strategies recommended to foster metacognition and autonomous learning

The focus group data revealed that pupils moved through a learning arc from initial difficulty to independent strategy use. At first, they encountered confusing words, unclear data, or challenging questions. As they persisted, they demonstrated learning resilience and strategic reading behaviors, including simplifying problems, writing formulas, using real examples, summarizing text, identifying keywords, and rechecking answers.

Table 5. *Reading Strategy Themes from Qualitative Findings*

Stage	Observed Learner Experience	Recommended Strategy
Before independent learning	Confusion with words, data, and task demands	Teacher modeling, guided reading, shared analysis, and questioning prompts
During strategy development	Persistence, re-reading, simplifying, and seeking clues	Progressive summarization, keyword identification, concept mapping, and strategy checklists
After independent learning	Rechecking, reflecting, and selecting effective solutions	Self-evaluation logs, answer verification routines, and reflective journals

Note: Recommended strategies were synthesized from quantitative and qualitative findings.

These strategies translate the findings into classroom practice by helping pupils move from scaffolded comprehension to independent regulation. The approach is consistent with studies emphasizing that explicit metacognitive strategy instruction and reflective reading practices improve comprehension, critical reading, and autonomous learning (Moir et al., 2020; Ruipérez, 2022; Sirimangkalavanit & Vanichwatanavorachai, 2023).

Teachers' acceptability of the proposed strategies

Table 6. *Acceptability of the Proposed Evidence-Based Reading Strategies*

Area	Overall Mean	SD	Verbal Interpretation
Practicality	3.68	0.228	Highly Acceptable
Relevance	3.92	0.110	Highly Acceptable
Potential Effectiveness	3.88	0.180	Highly Acceptable

Legend: 3.26-4.00 = Highly Acceptable; 2.51-3.25 = Moderately Acceptable; 1.76-2.50 = Acceptable; 1.00-1.75 = Least Acceptable.

Teachers rated the strategies as highly acceptable in all three areas. They considered the strategies feasible for regular classroom routines, relevant to curriculum goals and learner needs, and potentially effective in improving comprehension, motivation, autonomy, and collaboration. Minor adjustments may still be needed to address varied learner abilities and to structure peer interaction more deliberately, but the overall results support the adoption of the proposed strategies in specialized reading instruction.

CONCLUSION

The study concludes that exceptional Grade 5 pupils in the specialized reading class demonstrated evident metacognitive ability and autonomous learning. Pupils were generally able to plan, monitor, and evaluate their learning strategies and showed strong capacity for critical thinking, decision making, and problem solving across literary and scientific tasks. These abilities show that academically advanced elementary learners can already engage in reflective and self-directed learning when they are given appropriate performance-based tasks and structured support.

A significant positive relationship was established between metacognitive ability and autonomous learning. Pupils who demonstrated stronger metacognitive knowledge and regulation also showed stronger autonomous learning skills. The qualitative findings further revealed that this relationship was shaped by a supportive sociocultural classroom context, where teacher scaffolding, peer support, emotional safety, and independent practice helped pupils gradually internalize self-regulatory strategies. Thus, metacognition and autonomous learning are mutually reinforcing and can be strengthened through scaffolded, reflective, and evidence-based reading instruction.

Recommendation

Reading teachers should explicitly integrate metacognitive strategy instruction into reading lessons by teaching pupils how to plan before reading, monitor comprehension while reading, and evaluate strategies after completing tasks. Think-aloud modeling, guided questioning, strategy checklists, and self-evaluation journals may be used to help pupils transfer metacognitive strategies across literary, mathematical, and scientific texts.

Schools should adopt the proposed evidence-based reading strategies as part of specialized reading instruction. The strategies should begin with guided and shared reading experiences and gradually transition pupils toward independent strategic reading. Classroom activities should include summarization, keyword identification, problem simplification, concept mapping, answer verification, and reflective learning logs.

School administrators should provide professional development programs that train teachers in scaffolded reading instruction, metacognitive assessment, and learner autonomy. Such training should help teachers design tasks that balance challenge and support, particularly for academically advanced pupils who require both enrichment and structured guidance.

Future researchers may replicate the study in regular Grade 5 classrooms, other grade levels, or other subject areas to determine whether the relationship between metacognition and autonomous learning is consistent across different learner groups. Longitudinal studies may also be conducted to examine whether early metacognitive training influences later academic resilience, motivation, and independent learning.

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