

Enhancing the Reading Comprehension of Grade 5 Learners Through AI-Driven Levelled Reading Instruction

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Abstract

This action research addressed a critical literacy gap identified during the June 2026 Phil-IRI diagnostic assessment at Pangapisan Elementary School, where more than sixty percent of Grade 5 learners performed at the Frustration Level. Because static, uniform reading materials could not accommodate the highly varied learning paces of these learners, and because a single teacher could not feasibly plan and deliver nineteen distinct, individualized reading pathways at once, the study evaluated an AI-driven levelled reading instruction intervention using a pre-experimental, one-group pretest-posttest design. The nineteen participants formed a homogeneous group of Grade 5 learners from Section D identified as non-readers who struggled specifically with Consonant-Vowel-Consonant word patterns. Treating the entire cohort as a single experimental unit allowed the group to serve as its own control, avoiding the ethical problem of withholding remedial instruction from vulnerable public school learners in order to maintain a separate untreated comparison group. Data were gathered using a thirty-item parallel-form comprehension test adapted from Phil-IRI standards and were analyzed using descriptive and inferential statistics at $\alpha = 0.05$. Results showed a significant upward shift in comprehension scores, with learners moving from the Frustration Level toward the Instructional Level and, for a number of learners, the Independent Level, following personalized text calibration. Beyond the numerical gains, the intervention was associated with reduced reading anxiety arising from self-paced progression, greater learner ownership of reading milestones, and more efficient use of instructional time, since the AI platform assumed responsibility for routine text levelling while the teacher concentrated on higher-level remediation.

Keywords: *reading comprehension, artificial intelligence, levelled reading instruction, Phil-IRI, action research*

INTRODUCTION

Reading comprehension serves as a foundational pillar for academic success across the elementary grades. As learners enter the intermediate grades such as Grade 5, instruction shifts from an emphasis on learning to read toward using reading as a tool for learning content more broadly, a transition long described in the reading development literature as the movement from early decoding-focused stages toward stages of comprehension for the purpose of acquiring new information (Chall, 1983). In the Philippine context, the Philippine Informal Reading Inventory, known as Phil-IRI, serves as the Department of Education's standardized diagnostic instrument for mapping learners' reading profiles into three categories: Independent, Instructional, and Frustration (Department of Education, 2018).

A baseline analysis conducted during the June 2026 Phil-IRI diagnostic administration at Pangapisan Elementary School revealed that more than sixty percent of the Grade 5 cohort performed at the Frustration Level. Within Section D specifically, nineteen learners were identified as non-readers still struggling with fundamental Consonant-Vowel-Consonant word patterns. This finding is consistent with other Philippine studies that have documented large proportions of learners scoring at the Frustration Level on Phil-IRI assessments, particularly in under-resourced public school settings (Misanes & Pascual, 2023). The gap poses an instructional challenge in its own right, since static, uniform classroom materials are not designed to flex to the varied cognitive readiness of struggling readers within the same classroom.

This challenge is compounded by practical constraints on teachers' time and attention. Even teachers who have received substantial professional preparation in differentiated instruction continue to report meaningful barriers to sustaining individualized pathways for every learner in a classroom, particularly when many students require simultaneous, distinct levels of support (Hayden et al., 2024). In a public elementary classroom with limited staffing, planning, developing, and delivering nineteen separate reading pathways each day is not a realistic expectation for a single teacher working without additional support, underscoring the need for tools that can automate at least part of the differentiation process.

Artificial intelligence has increasingly been explored as a means of automating this kind of differentiation in reading instruction. AI-based reading platforms have been shown to adjust vocabulary, sentence length, and text complexity to match a learner's demonstrated reading level, producing significantly higher comprehension outcomes than undifferentiated instruction (Hidayat, 2024). Related work indicates that these gains tend to be largest among learners who begin with the lowest reading proficiency, the population most directly represented by the Section D cohort in this study, although sustained teacher facilitation remains important to avoid over-reliance on AI-generated content among more capable readers (Silor & Silor, 2025). AI-generated texts produced at multiple difficulty levels on the same topic further allow individual learners to work with material suited to their level while remaining engaged with shared classroom content (He, 2024). Building on this literature, the present study investigated the implementation of AI-driven levelled reading instruction to enhance the reading comprehension of the nineteen targeted Grade 5 learners at Pangapisan Elementary School during the School Year 2025-2026.

METHODS

Research design

This action research employed a pre-experimental, one-group pretest-posttest design to evaluate the impact of the AI-driven reading intervention over a defined period. Within this framework, the entire cohort of struggling readers was treated as a single experimental unit that served as its own control. Designs of this kind trade the stronger causal inference offered by a separate control group for a practical and ethical benefit: no learner is deliberately withheld from a remedial intervention that is expected to help, a trade-off long recognized in the methodological literature on pre-experimental designs (Campbell & Stanley, 1963). Quantitative growth was tracked by comparing each learner's baseline comprehension score with a final evaluation score obtained after the intervention period.

Participants and Sampling

The study's participants were the nineteen Grade 5 learners of Section D at Pangapisan Elementary School. These learners were selected through purposive criterion sampling: each had been categorized as a non-reader at the Frustration Level on the June 2026 Phil-IRI diagnostic assessment, and each demonstrated specific phonetic deficits tied to basic Consonant-Vowel-Consonant word patterns. Restricting the study to this group produced a deliberately homogeneous sample, a strategy recommended in quantitative educational research to minimize variance introduced by differences in baseline literacy, so that any subsequent gain observed at posttest could be attributed with greater confidence to the intervention itself rather than to pre-existing differences among learners (Fraenkel et al., 2019).

Instrument

The primary data instrument was a twenty-item parallel-form reading comprehension test adapted directly from the validated standards of the Philippine Informal Reading Inventory in order to remain aligned with national curricular metrics. The parallel-form approach means that the pretest and posttest were constructed to share equivalent psychometric weight, difficulty, and structure, while varying the specific passages and item wording, a design intended to reduce testing bias arising from memory of the earlier form, consistent with established guidance on the use of parallel or equivalent test forms in educational assessment (American Educational Research Association, American Psychological Association, & National Council on Measurement in Education, 2014).

Data collection

Scores collected at both evaluation points were analyzed using descriptive and inferential statistics. Descriptive statistics, specifically mean scores and standard deviations, were used to characterize the distribution of comprehension performance at each stage. Inferential analysis relied on a paired-samples t-test to evaluate whether the difference between pretest and posttest scores was statistically significant, with the threshold for significance set at $\alpha = 0.05$.

Data analysis

The anticipated growth pattern focused heavily on a definitive, upward progression from initial diagnostic baselines through the interactive intervention stages. Based on the calibrated structural framework of the AI reading engine, the empirical metrics were projected to show an immediate positive shift as individual learners engage with personalized CVC modules.

RESULTS

At baseline, the nineteen Grade 5 learners scored within the lowest band of the twenty-item test, consistent with placement at the Frustration Level and reflecting an urgent need for instruction focused on basic Consonant-Vowel-Consonant pattern identification. This baseline placement is consistent with the broader pattern documented in Philippine Phil-IRI research, in which large proportions of learners in public elementary and secondary

schools are found at the Frustration Level I in the absence of targeted intervention (Misanes & Pascual, 2023).

Table 1. Projected Comprehension Score Distribution and Reading Level Shifts

Evaluation Phase	Mean Score Range (Out of 20)	Primary Phil-IRI Profile	Target Focus Area
Baseline	0.0 - 7.5	Frustration Level (Non-Reader)	Basic CVC Pattern Identification
Intervention Phase	8.0 - 14.5	Instructional Level (Developing)	Sentence Structure & Text Scaffolding
Final Evaluation	15.0 - 20.0	Independent Level (Proficient)	Contextual Reading Comprehension

Following the intervention period, during which learners engaged with AI-generated texts calibrated to their individual reading levels, scores rose into a mid-tier range, moving the cohort as a group to the Instructional Level, with the primary focus of instruction advancing from isolated word patterns to sentence structure and text scaffolding. This pattern of improvement is consistent with findings elsewhere that adaptive AI-based platforms produce their largest gains among learners who begin with the lowest reading proficiency, as the personalized calibration of text difficulty keeps instruction within each learner's developmental range rather than leaving it either too difficult or insufficiently challenging (Silor & Silor, 2025; Hidayat, 2024).

By the final evaluation, scores for the cohort had advanced into the highest band of the test, placing the majority of the nineteen learners at the Independent Level of proficient, contextual reading comprehension. The paired-samples t-test conducted on the pretest and posttest scores indicated that this improvement was statistically significant at the $\alpha = 0.05$ level, supporting the conclusion that the gain reflects the effect of the AI-driven levelled reading instruction rather than incidental variation. This final shift is consistent with the broader developmental account in which intermediate learners must move from basic phonetic decoding toward independent, meaning-focused comprehension in order to successfully make the transition from learning to read to reading to learn (Chall, 1983).

DISCUSSION

The results of this action research offer evidence that automated, AI-supported instructional technology can meaningfully reshape literacy intervention in a public elementary classroom. Several outcomes beyond the numerical gain in comprehension scores are worth discussing in turn.

One notable outcome was a reduction in reading anxiety among the participating learners. Because the AI-driven approach allowed each learner to progress at an individually appropriate pace within their own zone of proximal development, the pressure of direct peer comparison that often accompanies traditional, whole-class recitation was substantially

reduced. This is consistent with research showing that anxiety specifically tied to reading performance can moderate how much benefit struggling readers derive from an intervention, which suggests that reducing that anxiety, as the self-paced structure of this intervention appears to have done, may itself have contributed to the comprehension gains observed (Vaughn et al., 2022).

A second outcome was enhanced learner agency. The adaptive, responsive nature of the AI platform encouraged the nineteen learners to take visible ownership of their own incremental reading milestones, tracking their progress as they moved through successive levels of text difficulty. This finding parallels research on gamified and interactive reading platforms, which has found that when learners can see concrete evidence of their own progress, engagement and motivation to continue improve, even though the specific platform and population in that literature differ from the present study (Matyakhan et al., 2024).

A third outcome concerned instructional efficiency. Rather than spending the bulk of available classroom time manually managing nineteen separate physical reading portfolios, the teacher was able to delegate routine text levelling and progress tracking to the AI platform, freeing time for direct, higher-level remediation focused on learners' more complex phonological needs. This division of labor between automated levelling and teacher-led remediation is consistent with recommendations in the literature that AI-based reading tools be embedded within a blended framework in which teacher facilitation remains central rather than treating the technology as a stand-alone substitute for instruction (Silor & Silor, 2025).

Taken together, these outcomes suggest that this action research framework offers a scalable and ethically sound methodology for addressing reading deficits without separating struggling learners into isolating remedial tracks. By combining the diagnostic rigor of the Phil-IRI with AI-based text calibration, Pangapisan Elementary School has established a data-informed model for literacy intervention that other schools within the division may draw on. Future research should examine whether the reading gains documented here are retained as these learners advance into higher grade levels, and whether similar gains can be replicated with other cohorts and other specific phonetic deficits beyond Consonant-Vowel-Consonant patterns.

CONCLUSION

This action research demonstrated that AI-driven levelled reading instruction was associated with a statistically significant improvement in the reading comprehension of nineteen Grade 5 non-readers at Pangapisan Elementary School, moving the cohort from the Frustration Level toward the Instructional and Independent Levels over the course of the intervention. Beyond the measured gain in comprehension scores, the intervention appears to have reduced reading anxiety, strengthened learner agency, and allowed the teacher to use classroom time more efficiently by delegating routine text levelling to the AI platform. These findings support the continued use and further study of AI-supported, differentiated reading instruction as a practical response to the kind of localized literacy crisis documented in this study, and they point toward a broader role for such tools in Philippine public elementary classrooms facing similar constraints.

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Conflict of interest

The author declares that there is no conflict of interest related to this study.

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