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EFFECTIVENESS OF PICTURE EXCHANGE COMMUNICATION SYSTEM (PECS) TO IMPROVE THE READING COMPREHENSION OF FRUSTRATED- LEVEL READERS

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Abstract

This study examined reading comprehension before and after a Picture Exchange Communication System (PECS) intervention among 40 frustration-level learners in the Reading Intervention Program at Pajo National High School during school year 2026–2027. The quantitative study used a one-group pretest–posttest design and an adapted Reading Comprehension Test covering literal, inferential, and evaluative comprehension. The intervention comprised 20 daily one-hour sessions over four weeks. Means and standard deviations summarized the scores, and paired-sample t-tests compared pretest and posttest performance. Mean percentage scores rose from 55.00% to 79.25% for literal comprehension, from 55.50% to 85.00% for inferential comprehension, and from 55.25% to 81.75% for evaluative comprehension. The reported overall mean increased from 5.53 to 8.20, and all reported paired comparisons yielded $p < .001$. The results document improvement within the group; without a comparison group, they do not isolate the effect of PECS. The findings informed a proposed PECS-Based Reading Instructional Guide that uses picture cues and structured practice across the three comprehension domains.

Keywords: Picture Exchange Communication System (PECS), reading comprehension, frustration-level learners, Pajo National High School, one-group pretest–posttest design

Introduction

Developing strong reading comprehension is foundational to lifelong learning, critical thinking, and meaningful participation in society; it empowers learners to connect ideas, interpret purpose, and draw evidence-based conclusions from texts across all subject areas. Yet building this essential skill remains one of the most pressing education priorities worldwide: nearly half of all adolescents aged 12 to 15 cannot yet apply these core competencies at basic proficiency levels (Samborska, 2024). Even before the global pandemic, millions of learners fell below grade-level benchmarks, and extended disruptions added approximately 100 million more children to this group gaps that continue to affect learning outcomes today (United Nations Educational, Scientific and Cultural Organization [UNESCO], 2021). While literacy recovery efforts are underway across all regions, progress is uneven, requiring sustained, targeted, and context-specific action to reverse cumulative learning losses (UNESCO, n.d.).

A look across nations reveals meaningful differences in how reading proficiency has shifted in recent years. Many high-performing Western systems have seen measurable declines following the pandemic, linked to extended school closures and altered out-of-school learning environments, with impacts distributed unequally across learner groups (Ludewig et al., 2025). Even so, several Western and high-income economies maintain relatively strong standing: for example, Ireland reports over 80% of its learners meeting minimum reading standards, while many peer nations work to recover ground lost during disruptions (Samborska, 2024). These systems benefit from long-standing investments in literacy infrastructure, consistent instructional resourcing, and more stable home-learning contexts factors that help explain why proficiency levels remain comparatively higher than in many Southeast Asian contexts. Disparities persist within these systems as well; learners from marginalized backgrounds continue to face the greatest barriers to full recovery despite large-scale catch-up programming (Organization for Economic Co-operation and Development [OECD], 2023).

In Southeast Asia, the situation calls for urgent and intentional action: recent findings confirm that one in two Grade 5 students still reads below expected proficiency, with little overall improvement since pre-pandemic levels despite

years of education disruptions (UNICEF & SEAMEO Secretariat, 2025). This assessment covers Cambodia, Lao PDR, Malaysia, Myanmar, the Philippines, and Viet Nam, noting that literacy progress has stalled even as mathematics skills show modest gains (UNICEF & SEAMEO Secretariat, 2025). Outcomes vary widely across the broader region; East Asian systems such as South Korea also show strong results, with more than 80% of adolescents meeting minimum comprehension standards (Samborska, 2024). Research identifies interconnected factors behind these gaps including socioeconomic conditions, alignment between home language and medium of instruction, availability of learning materials, and daily time use: structured family interaction supports literacy growth, while substantial work outside the home correlates with lower proficiency (Australian Council for Educational Research [ACER], 2024). Compared to higher-performing systems, many Southeast Asian contexts face compounded challenges of resource limitation, multilingual learning environments, and greater socioeconomic inequality, which together slow literacy recovery.

Within this regional landscape, the Philippines faces particularly significant literacy challenges. Results from the 2022 Programme for International Student Assessment (PISA) place Filipino 15-year-olds at an average reading score of 347 well below the international average of 476, and ranking 76th among 81 participating economies (OECD, 2023). The OECD estimates that every 20-point difference below the international average corresponds to roughly one year of lost instruction, meaning Filipino learners trail expected proficiency by approximately five to six years. While the Department of Education has prepared extensively for the 2025 PISA administration and anticipates improved outcomes, the scale of these gaps makes immediate, locally responsive intervention essential (Marcelo, 2025).

At Pajo National High School (PNHS), early assessments conducted at the opening of classes using the Philippine Informal Reading Inventory (Phil-IRI) identified forty (40) Junior High School learners currently reading at the frustration level meaning they cannot independently process and understand grade-level texts who are officially enrolled in the Reading Intervention Program for School Year 2026–2027. As the school designs and delivers targeted support, identifying and implementing evidence-based, accessible strategies is central to helping these students close accumulated learning gaps.

One promising approach being explored is the Picture Exchange Communication System (PECS), a tool originally developed and validated to support communication and learning in Special Education settings. PNHS now adapts PECS for use in general reading comprehension instruction within its remediation program. This approach rests on the understanding that struggling readers often thrive with structured, visually supported learning that connects images, symbols, and written text to clear meaning. Extending a method proven effective for learners with specialized communication needs to broader literacy instruction offers an inclusive, learner-centered pathway to help students move beyond frustration-level reading and build durable comprehension skills.

While existing research has documented reading proficiency trends globally, across Western nations, and throughout Southeast Asia, most studies focus on system-level assessment results, primary education settings, or disability-specific interventions. PECS itself is well-validated and widely used to support communication and foundational skills in Special Education; however, there remains limited empirical evidence and few local studies examining its adaptability, feasibility, and effectiveness as a reading comprehension intervention for general-enrollment Junior High School learners especially those identified as frustration-level readers in public schools like PNHS. This gap emphasizes the need to investigate whether a tool designed originally for specialized contexts can be successfully adapted to meet the distinct literacy needs of older struggling readers, thereby contributing actionable, context-relevant evidence to guide local reading intervention practice.

Theoretical Framework and Legal Bases

Likewise, it is anchored on three complementary theories that collectively support the adaptation of the Picture Exchange Communication System (PECS) to improve reading comprehension among frustration-level Junior High School learners: Verbal Behavior Theory (Skinner, 1957), Dual Coding Theory (Paivio, 1986), and Explicit Comprehension Instruction (Pearson & Dole, 1987). Together, they provide the conceptual basis for why a visual, structured, and systematically taught approach is appropriate and effective for learners who struggle with text-based meaning-making.

Skinner's Verbal Behavior Theory defines language and communication as learned behaviors shaped through functional interaction, where communication is not merely the expression of words but a purposeful exchange driven by clear, observable outcomes and responses. Skinner (1957) framed verbal behavior as a set of distinct functional units such as requesting, labeling, and responding that are acquired and strengthened when an action produces a consistent, meaningful result. The theory emphasizes that communication skills develop most effectively when learners can see the immediate purpose of their actions, receive clear feedback, and progress step-by-step from concrete, observable exchanges to more abstract forms of expression.

This theory anchors the core premise of the study: that reading comprehension is a form of verbal behavior that can be systematically taught and reinforced through structured exchange, rather than assumed to emerge naturally from exposure to text. It directly supports the use of PECS, which operates on functional communication, using cards and images to request, identify, and describe building the very same foundational connections needed for literal comprehension (recognizing and stating what is explicitly in the text). As learners progress from exchanging images to connecting symbols to written words and sentences, they build the observable, purpose-driven responses that form the basis for inferential comprehension (reading between the lines) and eventually evaluative comprehension (making judgments about text meaning). The theory further underpins the comparison of pre-test and post-test results, as it predicts that consistent, functional intervention will produce measurable improvement across all three comprehension dimensions, confirming whether the approach successfully narrows identified learning gaps.

Paivio's Dual Coding Theory posits that the human brain processes and stores information through two distinct but interconnected systems: a verbal system specialized for language and text, and a nonverbal imagery system specialized for visual and spatial representations. According to Paivio (1986), these systems operate in parallel and reinforce one another when information is presented both verbally and visually, it creates stronger memory traces and deeper understanding than when presented in only one form. The theory explains that visual images serve as mental anchors: they provide a concrete reference point that makes abstract language meaningful, especially for learners who are not yet proficient with text alone.

Dual Coding Theory provides the cognitive foundation for why PECS with its combination of images, symbols, and written text is well-suited to struggling readers at the frustration level. For literal comprehension, images help learners directly match written words to clear, concrete meanings, reducing the cognitive load of decoding and allowing them to focus on identifying explicit information. For inferential comprehension, the paired visual-verbal structure supports learners in connecting what they see and read to implied meaning, as visual cues fill gaps in their text-based understanding. For evaluative comprehension, having both formats helps learners organize and articulate their own judgments by referring to visual evidence alongside written content. This dual-pathway processing also explains why a significant difference is expected between pre-test and post-test performance: by strengthening both systems simultaneously, PECS builds more robust and accessible comprehension skills compared to text-only instruction, making improvement measurable across all three levels.

Pearson and Dole's Explicit Comprehension Instruction model establishes that reading comprehension strategies must be taught directly, systematically, and intentionally not left for learners to discover on their own. The framework outlines a clear sequence: teachers first explain exactly what a strategy is and why it matters, model its use aloud, guide learners through practice with support, and gradually release responsibility until students can apply the strategy independently (Pearson & Dole, 1987). This approach is built on the understanding that struggling readers do not naturally acquire effective comprehension habits; they need visible, step-by-step guidance that makes the usually hidden thinking process of skilled readers accessible and replicable.

This theory shapes the intervention design and measurement structure of the entire study, ensuring that PECS is not used randomly but as a structured teaching tool that progresses from guided to independent use. For literal comprehension, explicit instruction teaches learners to systematically identify and recall information directly stated in the text using visual and textual prompts. For inferential comprehension, the model guides learners through the specific process of connecting explicit details to unstated meaning making that reasoning process clear rather than intuitive. For evaluative comprehension, learners are taught a consistent framework for analyzing and assessing text meaning, moving beyond understanding to forming reasoned judgments. The pre-test measures baseline independent ability before this structured teaching begins; the post-test measures the extent to which learners have internalized these

strategies and can apply them on their own. Any significant difference between the two scores will demonstrate that explicit, systematic strategy instruction delivered through PECS has successfully built durable comprehension skills, validating the approach for frustration-level readers.

First, anchored on the 1987 Philippine Constitution, Article XIV, Section 1, the supreme law of the land explicitly states that the State shall protect and promote the right of all citizens to quality education at all levels and shall take appropriate steps to make such education accessible to every learner; it affirms that education is a fundamental right, not a privilege, and obliges all education stakeholders to ensure that instruction is responsive to individual needs so that no one is left behind due to inadequate support or mismatched learning opportunities. Consistent with this, this constitutional mandate validates the core purpose of the research: to assess the current reading comprehension level of JHS struggling readers before intervention, covering literal, inferential, and evaluative skills, and to measure improvement after applying PECS; it confirms that identifying frustration-level readers and providing targeted interventions is not merely institutional practice but a State responsibility, and further upholds the study's premise that every learner is entitled to instruction that matches their readiness, and that measurable growth in all three comprehension domains is a necessary component of quality education.

Complementing this constitutional mandate is Republic Act No. 10533 (Enhanced Basic Education Act of 2013), which institutes a learner-centered, inclusive, and developmentally appropriate K-12 curriculum designed to ensure learners master essential competencies at each grade level, and explicitly requires the Department of Education to provide appropriate interventions, remediation, and support services for learners who struggle to meet expected standards, ensuring that education is relevant, liberating, and accessible to all regardless of ability or background. Accordingly, this law directly supports the study's pre-test and post-test design across literal, inferential, and evaluative comprehension, as well as the use of a structured intervention like PECS; it mandates that schools identify learners who are not meeting grade-level expectations and deliver evidence-based assistance to help them catch up, which aligns perfectly with the research objective to determine whether adapting PECS can raise comprehension performance from pre-intervention levels marked by difficulty to improved proficiency after the program, ensuring that learners acquire the skills required for successful progression through the K-12 curriculum.

Further reinforcing these legal provisions is Republic Act No. 12028 (Academic Recovery and Accessible Learning [ARAL] Program Act of 2024), which establishes a national, free, and targeted recovery program prioritizing reading and mathematics for learners from Kindergarten to Grade 10, specifically those performing below minimum proficiency, falling behind their grade level, or at risk of academic failure, and institutionalizes the conduct of regular assessments, the design of responsive interventions, and the provision of tutorial and remedial support grounded in learners' actual needs. In this regard, this law explicitly endorses the exact scope and target group of the research: Junior High School learners identified as frustration-level readers; it validates the practice of measuring reading comprehension across literal, inferential, and evaluative domains before and after intervention, confirms that exploring adapted strategies such as PECS is consistent with the national policy to close learning gaps, and reinforces that interventions must be assessed for effectiveness, making the study's pre-post comparison legally and programmatically relevant to national education recovery efforts.

Finally, providing the official administrative framework is DepEd Order No. 14, s. 2018 (Policy Guidelines on the Administration of the Revised Philippine Informal Reading Inventory [Phil-IRI]), which prescribes Phil-IRI as the standard tool for determining learners' reading status, whether independent, instructional, or frustration level, in oral reading, silent reading, and comprehension, mandates that results from this assessment be used as the primary basis for designing, implementing, and evaluating school-based reading programs and interventions, and further specifies that learners identified at the frustration level must be given immediate and appropriate support to develop grade-level reading abilities. With this, the order provides the direct administrative and procedural basis for how respondents are selected and assessed in the research; it justifies measuring comprehension across literal, inferential, and evaluative dimensions before and after PECS implementation, as these are the core competencies Phil-IRI and related reading assessments seek to develop, and also confirms that conducting a study to find effective strategies for frustration-level readers is aligned with DepEd's mandate to turn every child into a reader capable of understanding text at their grade level.

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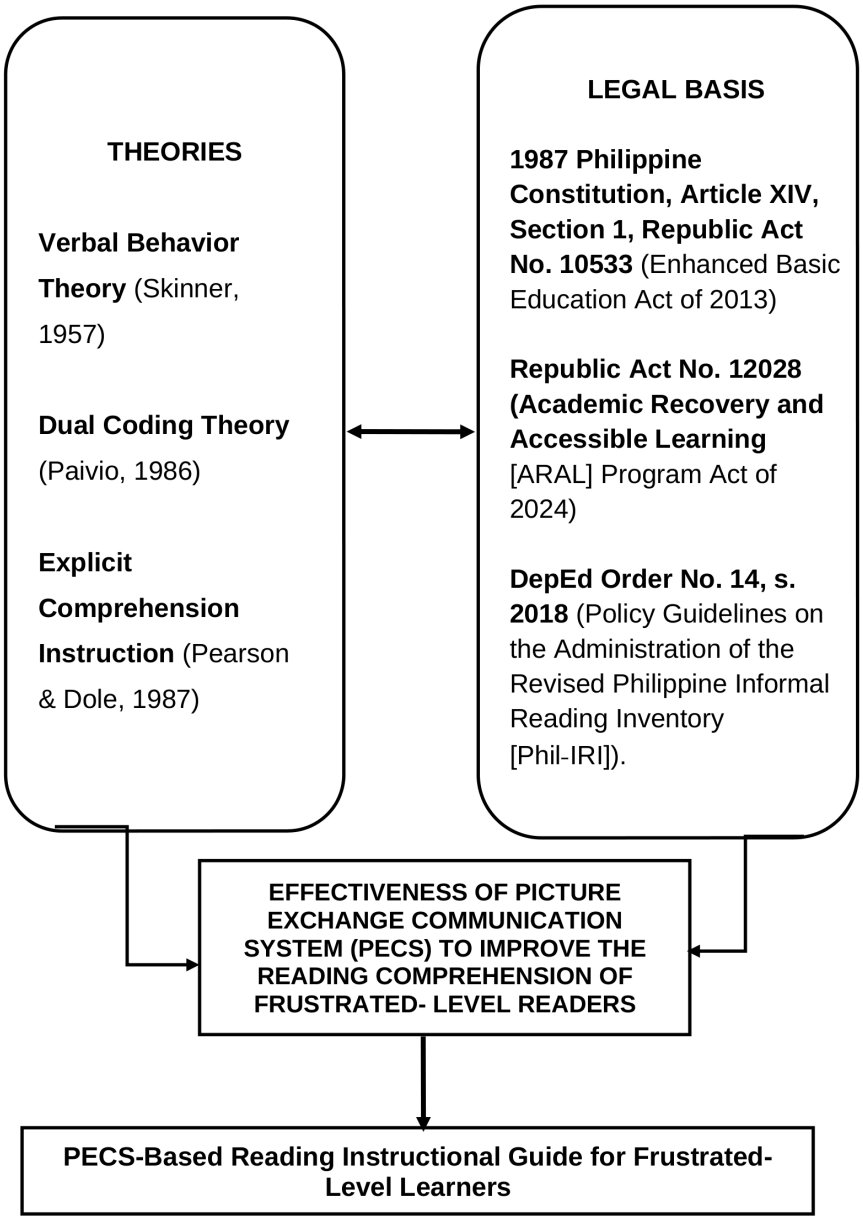


Figure 1
Theoretical Framework of the Study

THE PROBLEM

Statement of the Problem

This study examined the effectiveness of Picture Exchange Communication System (PECS) in improving the reading comprehension of frustrated-level learners at Pajo National High School during the School Year 2026–2027 as basis for PECS-Based Reading Instructional Guide for Frustrated-Level Learners.
Specifically, it seeks to answer the following questions:

What is the level of reading comprehension of the Junior High School struggling readers before the implementation of PECS in terms of:
1.1 literal comprehension;
1.2 inferential comprehension; and
1.3 evaluative comprehension?
What is the level of reading comprehension of the same respondents after the implementation of PECS in terms of:
2.1 literal comprehension;
2.2 inferential comprehension; and
evaluative comprehension?
Is there a significant difference between the pre-test and post-test reading comprehension levels of the respondents after the intervention?
Based on the findings, what PECS-Based Reading Instructional Guide for Frustrated-Level Learners can be proposed?

Statement of the Null Hypothesis

There is no significant difference between the pretest and post-test reading comprehension levels of the respondents after the intervention.

Methods

Design and Study Flow

This study employed a quantitative research approach utilizing a quasi-experimental one-group pretest–posttest design. This design was highly appropriate and necessary for the investigation because it focused on measuring the actual change within the same group of frustrated-level students at Pajo National High School before and after the implementation of the PECS intervention. By assessing the exact same respondents across both phases, the design effectively tracked individual and collective progress in literal, inferential, and evaluative comprehension, ensuring that any observed improvement could be reasonably attributed to the intervention rather than differences between separate groups. Moreover, this approach was particularly suitable in school settings where forming a comparable control group might have been impractical, ethically undesirable, or disruptive to regular instruction, allowing all identified struggling readers to receive the targeted support they urgently needed while still generating valid, measurable evidence of effectiveness.

Input. In the Input phase, the study identified the key variables to be assessed: the level of reading comprehension of the Junior High School struggling readers before the implementation of PECS, measured specifically in terms of literal comprehension, inferential comprehension, and evaluative comprehension; and the level of reading comprehension of the same respondents after the implementation of PECS, again evaluated across the same three comprehension domains.

Process. In the Process phase, the research outlined the methods and activities that would be undertaken to gather and analyze data. This included the use of a quasi-experimental one-group pretest–posttest design, followed by the complete data-gathering procedure: securing approval from concerned authorities, seeking informed consent from the respondents, administering the assessment tools, retrieving the completed instruments, and applying the appropriate statistical treatments to interpret the results.

Output. In the Output phase, the study anticipated the primary result of the investigation: a PECS-Based Reading Instructional Guide for Frustrated-Level Learners designed based on the findings to better support struggling readers in developing their reading comprehension skills.

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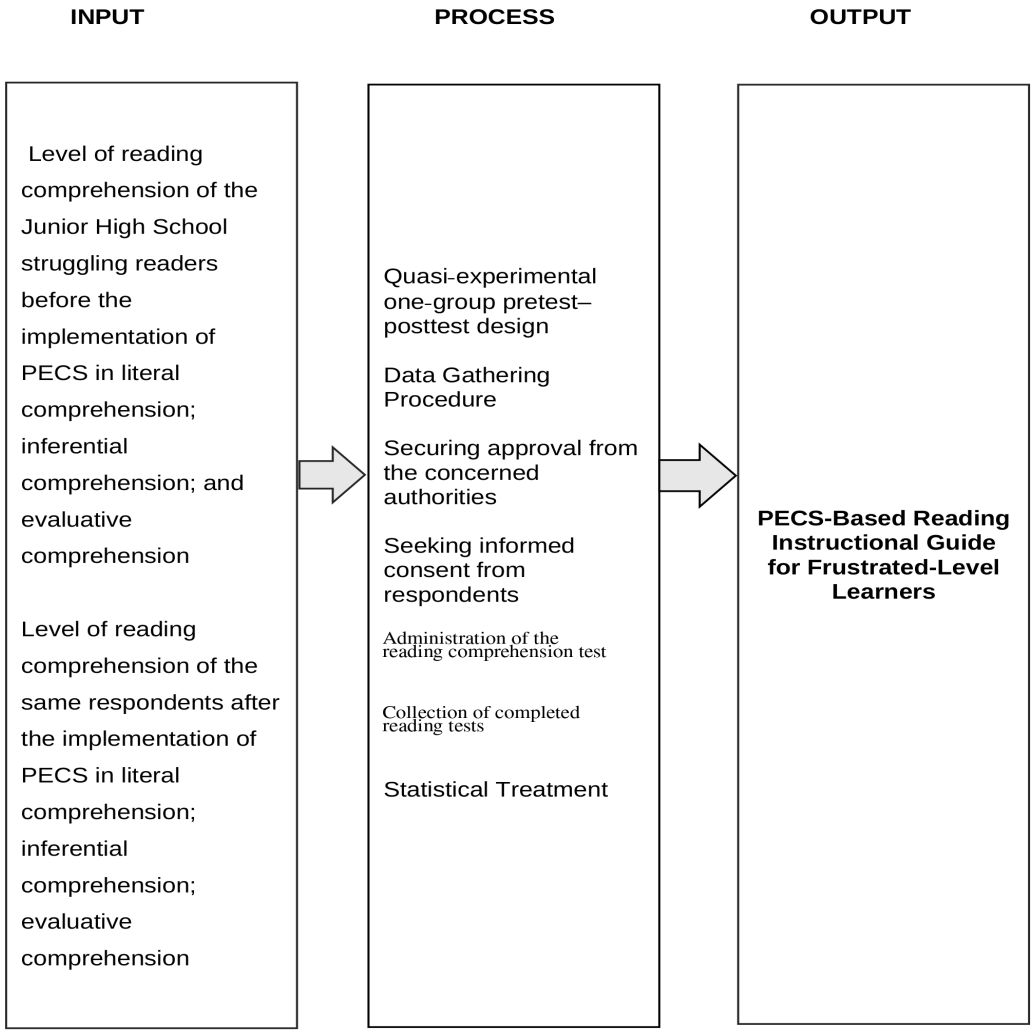


Figure 2
Flow of the Study

Research Environment

The study was conducted at Pajo National High School, located along Sangi Road, Pajo, Lapu-Lapu City. Classified as a very large public secondary school headed by School Head Mitchel F. Misa, it was also the institution where the researcher was employed as an English Teacher.

This setting was highly appropriate and relevant for the investigation for several key reasons: first, the school already implemented an established reading intervention program, demonstrating its commitment to addressing literacy gaps and providing a ready context for integrating and testing the proposed PECS-based approach. Second, results from the beginning-of-school-year assessment using the Philippine Informal Reading Inventory (Phil-IRI) consistently identified a number of Junior High School learners performing at the frustration level, exactly the target respondents this study intended to support. Furthermore, the researcher's assignment at the school ensured convenient, ethical, and responsible access to participants and necessary resources, while the school's size and diverse learner population allowed for a meaningful assessment of the intervention's applicability within a typical public secondary school setting.

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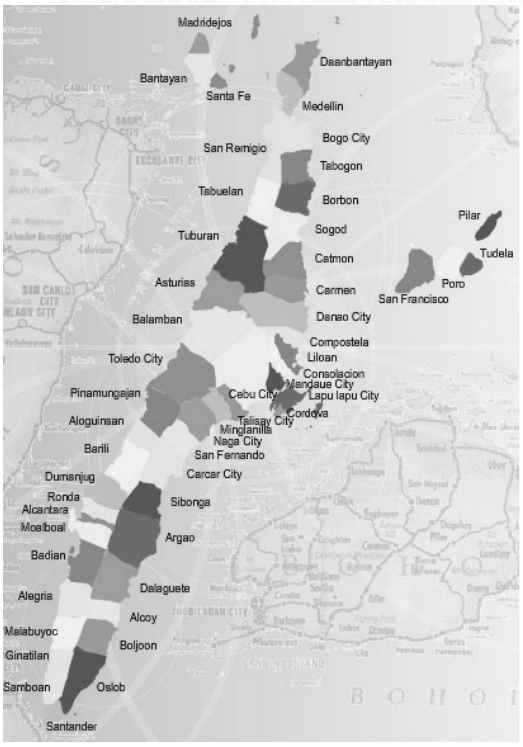




Figure 3
Location Map and School Photograph

Participants

The respondents of this study were the forty (40) students currently identified as frustration-level learners and enrolled in the Reading Intervention Program for School Year 2026-2027. They were selected using purposive sampling, a deliberate and appropriate method because the study specifically required participants who met exact, predefined characteristics directly tied to the research objectives; this approach ensured that only learners who genuinely needed and could benefit from the intervention were included, rather than drawing participants at random. The respondents satisfied the following inclusion criteria: they were officially enrolled at Pajo National High School for School Year 2026-2027, classified as frustration-level readers based on the Phil-IRI results administered at the opening of classes, actively participating in the school's Reading Intervention Program, and had secured written consent from their parents or guardians along with their own assent to take part in the study.

Table 1
Distribution of Respondents

Pajo National High School	Frequency (f)	Percentage (%)
Male	18	45
Female	22	55
Total	40	100

Instrument and Scoring

The primary data-gathering instrument of this study was a Reading Comprehension Test, adapted and modified from the validated assessment tools used by Caro et al. (2025) and aligned with the competency measures employed by Sagario and Garcia (2025). The instrument was divided into three parts covering the specific comprehension domains targeted in this research: Part I – Literal Comprehension, Part II – Inferential Comprehension, and Part III – Evaluative

Comprehension. It consisted of a total of 30 test items, with items distributed across the three parts to adequately measure each competency. Identical versions of the adapted instrument were administered for both the pretest and posttest to ensure consistency in measuring changes in the respondents' performance before and after the implementation of PECS.

To guarantee that the adapted instrument was appropriate, relevant, and aligned with Junior High School learning standards under the MATATAG Curriculum, it underwent rigorous content validation by a panel of three qualified experts: a Master Teacher in English, the school's Reading Coordinator, and a Research Statistician. These experts carefully reviewed each item to assess its alignment with curriculum competencies, clarity of instruction, suitability of difficulty level for frustration-level readers, and congruence with the study's objectives. All necessary corrections, adjustments, and refinements were integrated based on their comments and recommendations before the final form of the adapted instrument was prepared for actual use.

Once validated, the adapted instrument was used to measure the learners' ability to understand, interpret, and evaluate texts across the three specified comprehension domains, providing reliable data that allowed the researcher to determine the entry level of the respondents, track improvements following the implementation of PECS, and establish whether any observed changes were statistically significant. This process ensured that the assessment was sound, objective, and capable of accurately capturing the impact of the intervention on the students' reading comprehension skills.

This section presented the scoring procedure used to interpret the pre-test and post-test performance of Junior High School struggling readers across the three core domains of reading comprehension: Literal Comprehension, Inferential Comprehension, and Evaluative Comprehension. Each domain consisted of items designed to measure the learners' ability to recall explicit details, draw logical conclusions, and assess text meaning, respectively. The following table outlined the scale used to interpret their proficiency levels:

Table 2
Reading Comprehension Proficiency Descriptors

Level of Proficiency	**Raw Score Range (Per Domain)**	**Verbal Interpretation**
Beginning	0 – 3	Shows limited ability to understand texts across literal, inferential, and evaluative levels; relies heavily on guidance to identify details or grasp meaning.
Developing	4-5	Shows basic ability to recognize and describe explicit information; can recall some facts but still needs further support to make inferences or form evidence-based judgments.
Approaching Proficiency	6-7	Shows satisfactory ability to interpret texts across the specified domains; can draw conclusions and explain ideas with minimal guidance and provide simple supporting details.
Proficient – Advanced	8-10	Shows comprehensive and critical ability to comprehend texts; consistently identifies, analyzes, and evaluates meaning across literal, inferential, and evaluative levels with accuracy and sound reasoning.

Data Collection and Ethics

The source describes preliminary approval and preparation, pretesting, a four-week PECS intervention, and posttesting. The reported intervention consisted of 20 daily one-hour sessions. The procedure mixes planned and completed language; the ethics statement below is reproduced from the source.

Data Gathering Stage. Once all necessary preparations including instrument validation, ethical approvals, and participant orientation had been completed, the researcher first administered the pre-test to the selected respondents to establish their baseline performance across literal, inferential, and evaluative reading comprehension. Immediately following the pre-test, the Picture Exchange Communication System (PECS) intervention was systematically implemented over a period of four consecutive weeks, with one-hour sessions conducted daily for a total of 20 sessions.

During each daily session, the researcher guided the learners through the structured phases of PECS, beginning with identifying and exchanging visual cards to match words and simple phrases, then progressively combining images and text to construct meaning, respond to comprehension prompts, and describe ideas drawn from reading passages. The sessions moved sequentially from basic recognition and literal matching tasks to higher-level activities that required learners to connect details, infer relationships, and express reasoned opinions about texts all supported by the visual symbols and structured exchange format of PECS. The researcher ensured that all participants gained full familiarity with the tool's structure, symbols, and procedures at each stage, confirming that they felt adequately equipped and comfortable using the system before advancing to more complex tasks. Upon completion of the 20 sessions, the post-test was administered using the identical assessment instrument. This carefully timed and consistent sequence guaranteed that any changes observed in the post-test results could be reasonably attributed to the PECS intervention rather than prior knowledge or external factors.

This study strictly adhered to established ethical standards in educational research, with particular emphasis on informed consent, confidentiality, secure document management, and responsible practice.

Informed consent was obtained in writing from the parents or legal guardians of the respondents, and written assent was likewise secured from the learners themselves. All parties were fully informed about the study's purpose, the PECS intervention procedures, the nature of assessments, and their right to withdraw from the research at any time without penalty or effect on their academic standing. Participation was entirely voluntary, and no learner was pressured to take part in the investigation.

Confidentiality and the safekeeping of all documents were strictly maintained throughout the study. No names, initials, or personal identifiers were disclosed in any part of the final report; all records were identified using codes only. Hard copies of consent forms, assessment materials, and data sheets were stored in a locked, secure cabinet accessible only to the researcher. Digital files were password-protected, saved on an encrypted private device, and stored in a restricted folder. All gathered information was used solely for this research and was never shared with external parties. After the study was completed, physical documents were retained securely for the required period and then shredded; digital files were permanently deleted.

Regarding the use of Artificial Intelligence, AI tools were employed only as an auxiliary aid to organize reference materials, structure sections of the manuscript, and refine language clarity. AI was never used to generate data, fabricate findings, perform analysis, or replace the researcher's own critical judgment, interpretation, and writing. Every AI-assisted draft was thoroughly reviewed, verified, and revised by the researcher to ensure accuracy, authenticity, and full alignment with the study's actual results and ethical standards.

Statistical Analysis

First, the Weighted Mean was computed to determine the general level of the respondents' reading comprehension before and after the intervention across the three specified domains: literal comprehension, inferential comprehension, and evaluative comprehension. This measure clearly showed the average performance of the group and identified whether learners were progressing toward the expected proficiency standards after being exposed to PECS.

Second, the Standard Deviation was calculated to measure the spread or consistency of the scores. It revealed whether the learners' performance was closely clustered or widely varied, indicating how uniformly the group demonstrated comprehension skills and how consistently the PECS-based intervention influenced individual learners.

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Third, the Paired-Sample t-Test was used to test the significant difference between the pre-test and post-test mean scores of the same group of respondents. Since this study employed a one-group pretest–posttest design, this statistical tool was most appropriate to determine whether the observed improvement in reading comprehension was statistically significant and could be reasonably attributed to the implementation of PECS rather than chance or other factors.

Results and Discussion

The reported mean scores increased across literal, inferential, and evaluative comprehension. At posttest, 22 learners scored in the Proficient band for literal comprehension, 33 for inferential comprehension, and 29 for evaluative comprehension.

Pretest Performance

Table 3

Literal Comprehension Before PECS

Score	Frequency	Percentage	Level
8 – 10	0	0.00%	Proficient
6 – 7	21	52.50%	Approaching Proficiency
4 – 5	18	45.00%	Developing
0 – 3	1	2.50%	Beginning
Total	40	100%	
Mean Raw Score	5.50		
Mean Percentage Score	55.00%		
Standard Deviation	0.99		

Table 4

Inferential Comprehension Before PECS

Score	Frequency	Percentage	Level
8 – 10	2	5.00%	Proficient
6 – 7	16	40.00%	Approaching Proficiency
4 – 5	22	55.00%	Developing
0 – 3	0	0.00%	Beginning
Total	40	100%	
Mean Raw Score	5.55		
Mean Percentage Score	55.5%		
Standard Deviation	1.18		

Table 5

Evaluative Comprehension Before PECS

Score	Frequency	Percentage	Level
8 – 10	2	5.00%	Proficient
6 – 7	19	47.50%	Approaching Proficiency

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Score	Frequency	Percentage	Level
4 – 5	17	42.50%	Developing
0 – 3	2	5.00%	Beginning
Total	40	100	
Mean Raw Score	5.53		
Mean Percentage Score	55.25%		
Standard Deviation	1.30		

Posttest Performance

Table 6

Literal Comprehension After PECS

Score	Frequency	Percentage	Level
8 – 10	22	55.00%	Proficient
6 – 7	18	45.00%	Approaching Proficiency
4 – 5	0	0.00%	Developing
0 – 3	0	0.00%	Beginning
Total	40	100%	
Mean Raw Score	7.93		
Mean Percentage Score	79.25%		
Standard Deviation	1.19		

Table 7

Inferential Comprehension After PECS

Score	Frequency	Percentage	Level
8 – 10	33	82.50%	Proficient
6 – 7	7	17.50%	Approaching Proficiency
4 – 5	0	0.00%	Developing
0 – 3	0	0.00%	Beginning
Total	40	100%	
Mean Raw Score	8.50		
Mean Percentage Score	85.00%		
Standard Deviation	1.11		

Table 8

Evaluative Comprehension After PECS

Score	Frequency	Percentage	Level
8 – 10	29	72.50%	Proficient
6 – 7	9	22.50%	Approaching Proficiency

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Score	Frequency	Percentage	Level
4 – 5	2	5.00%	Developing
0 – 3	0	0.00%	Beginning
Total	40	100%	
Mean Raw Score	8.18		
Mean Percentage Score	81.75%		
Standard Deviation	1.30		

Table 9

Summary of Pretest and Posttest Comprehension

Indicators	Mean (Pre-test)	Level	Mean (Post-test)	Level
Part 1	5.50	Developing	7.92	Proficient
Part 2	5.55	Developing	8.50	Proficient
Part 3	5.53	Developing	8.18	Proficient

Reported Paired Comparisons

Table 10

Paired-Sample Comparisons of Reading Comprehension

Indicators	Mean (Pre-test)	Mean (Post-test)	Mean Difference	t-value	p-value	Decision	Interpretation
Part 1	5.50	7.92	2.42	10.46	<0.001	Reject H_0	There is a significant difference
Part 2	5.55	8.50	2.95	13.20	<0.001	Reject H_0	There is a significant difference
Part 3	5.53	8.18	2.65	11.35	<0.001	Reject H_0	There is a significant difference
Overall Weighted Mean	5.53	8.20	2.67	11.67	<0.001	Reject H_0	There is a significant difference

All reported paired comparisons yielded $p < .001$. The differences describe changes in this group. The design does not separate the contribution of the intervention from practice effects or other influences. The detailed posttest table gives a literal mean of 7.93, while the summary and paired-test tables give 7.92; the values are retained as reported.

Output of the Study

The proposed guide responds to the baseline difficulties documented across the three reading comprehension domains. It begins with picture-supported literal recall and progresses to connecting details, drawing inferences, and justifying judgments about a text.

The posttest results showed gains across the three domains but did not place every learner in the Proficient band. The guide therefore retains structured practice, opportunities for independent responses, and a final assessment. These are proposed instructional activities and targets.

PECS-BASED READING INSTRUCTIONAL GUIDE FOR FRUSTRATED-LEVEL LEARNERS

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I. Rationale

Reading comprehension is the foundation of academic success across all subject areas, yet many learners enter Junior High School still operating at the frustration level, unable to independently process, interpret, or evaluate grade-level texts. Nationally and locally, assessments consistently show that while struggling readers may recognize words, they often lack the structured, meaning-centered support needed to connect ideas, draw inferences, and form reasoned judgments skills essential for lifelong learning. Traditional text-only instruction frequently leaves these learners behind, as it does not provide the visual anchors and step-by-step reinforcement required to build durable comprehension proficiency.

This guide responds to that critical need by adapting the Picture Exchange Communication System (PECS) a tool proven effective in Special Education settings for general reading remediation. Grounded in Dual Coding Theory, Explicit Comprehension Instruction, and Verbal Behavior Theory, it integrates visual symbols, structured exchange, and systematic progression to make meaning accessible, memorable, and achievable. Following a four-week implementation with frustration-level learners at Pajo National High School, this approach demonstrated significant, consistent gains across literal, inferential, and evaluative comprehension domains. This guide formalizes that evidence-based practice, offering teachers a clear, feasible, inclusive framework to help struggling readers move beyond frustration and build the comprehensive literacy skills they need to thrive.

II. Objectives

This instructional guide aims to achieve the following specific goals:
Enable frustration-level learners to reliably identify, recall, and articulate explicitly stated information from texts, establishing a solid baseline of literal understanding.

Guide learners to systematically connect details, infer unstated meaning, and form reasoned judgments, advancing their proficiency in both inferential and evaluative comprehension.

Equip learners with transferable strategies and visual-referencing habits that allow them to approach new texts with reduced anxiety and increased capacity for self-directed understanding.

III. Scheme of Implementation

Table **11**
Scheme of Implementation

Component	**Details**
Target Users	Frustration-level Junior High School learners identified through Phil-IRI pre-assessment
Duration	4 consecutive weeks; 1 hour per session; 5 sessions per week; 20 sessions total
Implementation Setting	Designated reading intervention room or regular classroom with adequate space for individual and small-group work
Core Materials	PECS visual cards (symbols, images, words, phrases, sentences), leveled reading passages, response boards, progress tracking sheets
Implementation Principles	Systematic progression across phases; explicit modeling before independent practice; immediate positive reinforcement; consistent alignment with pre- and post-assessment standards; adherence to ethical guidelines and confidentiality
Assessment Points	Pre-test (Day 1), weekly formative checks (Days 5, 10, 15), post-test (Day 20)
Expected Outcome	Sustained improvement across literal, inferential, and evaluative comprehension; transition from frustration level toward independent reading proficiency

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IV. The Instructional Guide

PHASE 1 — FOUNDATION: LITERAL COMPREHENSION
Weeks 1–2 | Sessions 1–10
Goal: Connect images and text to build accurate recall of explicitly stated details

Table 12
Phase 1 Session Plan

Session Range	Focus	PECS Activity
1–3	Word–Image Matching	Learners match PECS picture cards to corresponding word cards from short passage vocabulary; state the word and its meaning aloud
4–6	Phrase Construction	Combine 2–3 cards (image + key words) to build phrases that describe people, places, actions, or events directly from the text
7–8	Explicit Detail Identification	After reading a brief passage, select and arrange cards to answer: Who? What? Where? When? — verifying answers by pointing to the exact line in the text
9–10	Guided Literal Response	Use sentence frames supported by PECS cards to write or speak complete answers about details explicitly stated in the text

PHASE 2 — CONNECTION: INFERENTIAL COMPREHENSION
Weeks 3–4 | Sessions 11–18
Goal: Link explicit details to implied meaning through visual reasoning

Table 13
Phase 2 Session Plan

Session Range	Focus	PECS Activity
11–12	Cause and Effect Matching	Presented with a text event, select the image card that shows a likely cause or effect; explain the connection: "The text says ___, so I know ___"
13–14	Predicting Outcomes	Before reading the ending, arrange PECS cards to show what will happen next; read to confirm or adjust; discuss why predictions were reasonable
15–16	Drawing Conclusions	Group related detail cards together and label the shared idea with a summary card; practice the phrase: "From these details, I can tell that ___"
17–18	Integrating Inferences	Read slightly longer passages; answer both literal questions and questions that require "reading between the lines," using cards to justify each response

PHASE 3 — JUDGMENT: EVALUATIVE COMPREHENSION & INDEPENDENCE
Week 4 | Sessions 19–20
Goal: Form and express reasoned opinions while consolidating independent strategy use

Table **14**
Phase 3 Session Plan

Session Range	Focus	PECS Activity
19	Evaluative Response	Introduce judgment cards (Agree/Disagree, Important/Unimportant, True/False, Best Reason); after reading, select a card and defend the choice using evidence from the text
20	Strategy Transfer & Post-Test	Complete a guided review: "Which card helped you understand best?"; gradually remove some visual supports to practice applying strategies independently; administer post-test

Conclusion

Reading comprehension scores increased after the PECS sessions in all three domains. The one-group design does not establish how much of the improvement was attributable to PECS. The findings informed the proposed instructional guide, which uses picture cues and structured practice to support literal recall, inference, and evidence-based judgments.

Recommendations

Based on the initially low comprehension performance across all domains, it is strongly recommended that the Pajo National High School reading intervention program prioritize sustained, targeted support that addresses the full range of comprehension skills rather than focusing only on basic recall. The early difficulty observed particularly in higher-order interpretive and evaluative thinking highlights the need to embed visual-supported strategies like PECS not as a short-term measure alone, but as an integrated component of regular literacy instruction, ensuring learners receive consistent practice in connecting ideas, drawing inferences, and forming reasoned judgments alongside foundational text processing. Teachers are encouraged to extend the structured, meaning-centered approach used in this study across grade levels and subject areas, while school administrators may institutionalize this inclusive strategy through training, resource allocation, and ongoing monitoring to ensure that all struggling learners build the durable, comprehensive proficiency needed for academic success.

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