The Use of Picture Word Card Media-Oriented Cognitive Learning Theory to Improve Early Reading Ability of Elementary Students

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Abstract: Cognitive learning theory suggests that linking familiar images with written language can help beginners connect meaning, print, and sound. However, evidence of improved reading scores offers limited explanation of how picture-word cards function alongside prior reading knowledge and instructional support. This study examined early reading outcomes following picture word card instruction among Grade I students at a public elementary school in South Tangerang, Indonesia. An explanatory sequential mixed methods framework guided a quasi-experimental comparison involving 68 purposively selected students, with 34 in each group. Pre-tests and post-tests were administered before and after four instructional sessions, and quantitative findings informed the development of a follow-up semi-structured interview guide for one teacher. Descriptive statistics and analysis of covariance were used to compare reading performance while accounting for initial scores. The experimental group's mean increased from 60.0 to 80.4, compared with 64.4 to 72.5 in the control group. ANCOVA indicated a significant group difference after pre-test adjustment, $F(1, 65) = 39.4$, $p < .001$, partial $\eta^2 = .377$. Initial reading performance also remained strongly associated with post-test achievement. These findings support a short-term advantage for the instructional approach as implemented, while leaving its cognitive mechanisms and the separate contribution of pictures unresolved. The study suggests using picture word cards with explicit attention to letter–sound relationships, guided practice, and support responsive to students' starting ability. Evidence from one school and four intervention sessions warrants cautious application in similar classroom contexts, and future research should examine retention and independent reading over longer periods

Keywords: picture word cards; early reading; cognitive learning theory; primary education; explanatory sequential mixed methods

INTRODUCTION

Early reading gives children access to written information and supports their participation in classroom learning. It involves learning how letters represent sounds and how these sounds form words with meaning. Research on word-reading development shows that secure connections between spelling, pronunciation, and meaning are central to recognizing words accurately (Ehri, 2020). Reading also draws on language comprehension and active processes such as attention and self-regulation, which extend beyond word recognition alone (Duke & Cartwright, 2021). Early reading instruction therefore needs to build knowledge of print while helping children use that knowledge in meaningful learning activities.

A practical difficulty arises when children can name familiar objects but cannot read the words that represent them. In an Indonesian study of beginning reading at a madrasah ibtidaiyah, Mastoah et al. (2025) identified continuing difficulties with reading fluently and

independently among some students. Although findings from one school cannot represent all Indonesian classrooms, they show why additional support remains necessary during the early years of schooling. For teachers, the challenge is to help children move from recognizing familiar meanings to examining and reading written forms. This makes the relationship between visual support and attention to print a specific issue for early reading instruction.

Picture word cards offer a way to bring familiar meanings and written language together within a short reading activity. A card pairs an illustration with its printed name, allowing the teacher to connect an object that children recognize with the word they are learning to read. Dual Coding Theory provides a cognitive explanation for this pairing by proposing that verbal and nonverbal representations can support learning through connections between them, as discussed in recent research on graphics and reading (Guo et al., 2020). Mayer's (2021) account of multimedia learning adds that useful learning requires learners to select relevant information and connect words and pictures with existing knowledge. Applied to early reading, these perspectives suggest that a picture can support access to meaning while instruction directs attention to the accompanying letters and sounds.

The presence of a picture, however, does not guarantee that it will support the intended reading task. In a meta-analysis of 39 experimental studies, Guo et al. (2020) found a moderate overall benefit of graphics for reading comprehension, with outcomes also varying by assessment format. More directly concerned with beginning readers, Eng et al. (2020) found that removing irrelevant details from storybook illustrations reduced competition for attention and improved comprehension. Neither finding directly establishes the effectiveness of picture word cards for learning to decode words, because the materials and reading outcomes differ. Together, they indicate that visual support should be evaluated in relation to what children attend to and what they are expected to learn.

Recent Indonesian studies provide more direct evidence on card-based early reading instruction. Mardhotillah et al. (2026) compared syllable-card instruction with conventional textbook teaching among 62 first-grade students and reported higher post-test reading performance in the experimental group. Lovita et al. (2025) likewise reported higher reading and writing outcomes among 42 second-grade students when a Picture Word Inductive model was supported by picture word cards. These findings support further examination of cards within structured literacy instruction, but the two interventions differ in their instructional focus and use of pictures. Syllable cards emphasize units of written language, whereas the combined approach studied by Lovita et al. includes both visual materials and an instructional model.

This distinction matters when interpreting what an improvement in reading scores can tell teachers. A positive result for a combined approach cannot establish the separate contribution of its pictures, practice activities, or instructional guidance. Related evidence also covers a wider range of approaches: Solichah and Fardana's (2024) scoping review identified visual, auditory, kinesthetic, and tactile activities across early literacy interventions. Such variety supports attention to how learning activities are organized, while limiting the assumption that different forms of sensory support produce equivalent outcomes. Picture word cards therefore need to be examined as part of the instruction in which they are used, with a clear account of the reading demands placed on students.

Students' existing reading knowledge is another consideration in understanding their responses to these activities. Ehri (2020) explains that learning written words depends on

knowledge of letter–sound relationships and the ability to connect sounds with spellings. A child who can name a pictured object may still need explicit help to identify its written name, while a more secure reader may be ready to read with fewer clues. From a cognitive learning perspective, the relevant instructional question is how support helps students connect new information with what they already know (Mayer, 2021). This suggests examining teacher guidance and students' starting ability alongside any difference in reading outcomes, without assuming that the same material meets every learner's needs in the same way.

The literature reviewed here leaves a specific explanatory gap between evidence of improved reading performance and accounts of how picture word cards support classroom learning. The comparisons reported by Mardhotillah et al. (2026) and Lovita et al. (2025) provide useful outcome evidence, but their different instructional packages leave questions about how visual support, reading practice, and teacher guidance work together. Evidence that illustrations can compete with attention to print further strengthens the need to examine their use carefully (Eng et al., 2020). What remains to be clarified in the present context is how a comparison of early reading outcomes can be understood alongside a teacher's account of students' responses, support needs, and continuing difficulties. Addressing this gap requires connecting the quantitative comparison with a focused classroom explanation, while recognizing that a teacher's account cannot directly verify changes in students' cognitive processes.

This study examines the use of picture word cards informed by cognitive learning theory to support elementary students' early reading. Its first objective is to compare post-test reading performance between the experimental and control groups while accounting for pre-test scores. Its second objective is to explore a teacher's explanations of the quantitative patterns, with attention to picture–word connections, instructional guidance, participation, and remaining reading difficulties. An explanatory sequential mixed methods design is used to connect the quantitative analysis with a follow-up interview with one teacher. By bringing these sources together, the study seeks to provide a classroom-based account of the observed reading outcomes and the conditions that may help teachers use picture-word cards purposefully.

METHOD

Research Design

This study used an explanatory sequential mixed methods design, in which quantitative data collection and analysis preceded a qualitative follow-up. The quantitative phase compared early reading performance between an experimental group receiving picture-word card instruction and a control group. The qualitative phase involved a semi-structured interview with one teacher to explain the quantitative patterns through an account of classroom practice. Priority was given to the quantitative comparison, while the interview provided contextual explanations and identified continuing difficulties. Following Creswell and Inoue (2025), the phases were linked when the quantitative findings informed the interview and when both sets of findings were interpreted together.

The quantitative component was framed as a quasi-experimental pre-test–post-test comparison. Purposive sampling was used to select participants; the procedure for allocating

them to conditions was [specify whether existing classes were used and explain how the experimental and control groups were determined].

Research Context and Participants

The research was conducted with Grade I students at a public elementary school in South Tangerang, Banten, Indonesia. The quantitative sample comprised 68 students, with 34 in the experimental group and 34 in the control group. The participants were chosen purposively.

One teacher was purposively selected for the qualitative follow-up to get a more in-depth perspective and understanding. The teacher's contribution concerned instructional practice and perceived student responses. The single-teacher account was treated as a contextual explanation rather than a representative account of teachers or direct evidence of students' internal cognitive processes.

Research Instruments

The quantitative instrument was an early reading test administered before and after the intervention. Early reading ability was operationalized as performance on the assessed tasks: letter recognition, letter–sound correspondence, word reading, and simple sentence reading. The test contained 15 jumbled words. [number and format of tasks], with scores calculated using [scoring rubric, weighting, and score range]. [State whether the same or equivalent test forms were used, how prompts were administered, and whether pictures appeared in assessment items.] Evidence of instrument quality comprised [describe only documented review, piloting, validity, reliability, or scoring-agreement procedures and their results].

A semi-structured interview guide supported the qualitative phase. Its questions addressed how the cards were used, how students connected pictures with print, the support different learners needed, and difficulties that remained. Follow-up prompts sought concrete examples and alternative explanations for improvement, including repeated practice and teacher attention.

Data Collection and Intervention

Data collection followed four stages: pre-testing, four intervention sessions, post-testing, and the teacher interview. The pre-test established each group's initial reading performance. The experimental group then received instruction using picture word cards informed by cognitive learning theory, while the control group received conventional reading instruction. [Describe the control activities and materials, the duration of each session, the timetable, and the interval between intervention and post-test.]

The card activities connected familiar objects with printed words and their pronunciation. The teacher introduced pictures and corresponding words, directed attention to letters and syllables, and guided students in combining syllables into words. Students matched pictures with written units and worked with peers to arrange cards, followed by reading words or simple sentences. Examples in the instructional materials included familiar Indonesian words such as *buku* and *bola*. These activities were intended to connect new print information with existing knowledge; they were not direct measures of cognitive change. [Confirm their distribution across the four sessions and report any documented implementation checks.]

After post-testing, the quantitative results were examined to identify patterns requiring explanation. The teacher interview then explored these patterns and the classroom conditions that might account for them. [Insert the interview date, duration, language, location or mode, interviewer's role, and the actual recording and transcription procedures.]

Data Analysis

The first objective was addressed using descriptive statistics and analysis of covariance (ANCOVA). Means and standard deviations summarized each group's pre-test and post-test performance, and mean changes described progress. ANCOVA used post-test score as the dependent variable, group as the fixed factor, and pre-test score as the covariate. Statistical significance was evaluated at .05, and partial eta squared summarized the group association within the model. The pre-test term was interpreted as an association with final performance, not as evidence of different treatment responses across ability levels.

Preliminary analyses included Shapiro–Wilk and Levene's tests. [Identify the distribution tested for normality and document the actual checks of model residuals, linearity, influential observations, and equal regression slopes.] [Insert the statistical software and version.] Pre-test adjustment was not treated as removing all possible class or teacher differences.

For the second objective, interview material was analysed thematically through familiarization, initial coding, candidate theme development, review, and refinement (Byrne, 2022). Coding focused on explanations relevant to the quantitative findings while remaining open to unexpected accounts. Claims of increased participation, dependence on pictures, and instructional support were retained only where supported by the interview. Contradictory examples were considered alongside positive accounts.

Integration of Quantitative and Qualitative Findings

Integration occurred by building the interview focus from the quantitative findings and interpreting them together (Creswell & Inoue, 2025). The integrated Results and Discussion linked statistical patterns with relevant teacher explanations and supporting quotations. For example, the adjusted group comparison was considered alongside accounts of reading practice and guidance, while the pre-test association was considered alongside support needs. Agreement, additional detail, and inconsistencies were examined. The interview contextualized the statistical findings without establishing causal mechanisms, measuring mediation, or treatment effects for student subgroups.

RESULTS AND DISCUSSION

This section presents the findings on students' early reading performance and discusses them in relation to cognitive learning theory and classroom instruction. It is organized around four themes: changes in early reading performance; connections between pictures, written words, and sounds; initial reading ability and support needs; and teacher guidance, engagement, and independent reading. The discussion brings together statistical results, relevant literature, and illustrative teacher accounts to explain the observed patterns while clarifying the limits of the evidence.

Changes in early reading performance

The experimental group showed a larger increase in early reading scores than the control group. As shown in Table 1, the experimental group increased from a pre-test mean of 60.0 (SD = 14.4) to a post-test mean of 80.4 (SD = 10.4). The control group increased from 64.4 (SD = 18.0) to 72.5 (SD = 13.2). Based on these rounded means, the increases were 20.4 and 8.1 points, respectively. The difference between the mean increases was therefore approximately 12.3 points. These descriptive results show that students in the experimental group made greater progress during the study, although the difference between the gains was not tested separately.

Table 1. Descriptive statistics for early reading scores

Group	n	Pre-test Mean	Pre-test SD	Post-test Mean	Post-test SD	Mean increase
Experimental	34	60.0	14.4	80.4	10.4	20.4
Control	34	64.4	18.0	72.5	13.2	8.1

The starting difference between the groups is relevant to this comparison. The experimental group began with a mean score of 4.4 points below the control group but finished with a mean score of 7.9 points above it. ANCOVA was therefore used to compare post-test performance while accounting for pre-test scores. The reported preliminary tests were Shapiro–Wilk W = .980, p = .346, and Levene's F(1, 66) = 0.266, p = .608. These tests did not identify statistically significant departures from normality in the tested distribution or unequal variances. However, the output does not identify the distribution used for the normality test or report the test of equal regression slopes. These results alone cannot establish that all ANCOVA assumptions were met.

The ANCOVA showed a statistically significant group difference after controlling for pre-test scores, F(1, 65) = 39.4, p < .001, partial η^2 = .377 (Table 2). Read alongside the descriptive results, this finding supports an advantage for the experimental group. The partial eta-squared value indicates a substantial group association within the fitted model. It should not be interpreted as showing that picture word cards caused 37.7% of all improvement in reading. Adjusted group means and confidence intervals were not available in the supplied output, so the 7.9-point post-test difference should be understood as an unadjusted comparison.

Table 2. ANCOVA of early reading post-test scores

Source	df	F	p	Partial η^2
Group	1	39.4	< .001	.377
Pre-test	1	132.7	< .001	.671
Residual	65	—	—	—

***Note**. The dependent variable was the post-test score, and the covariate was the pre-test score.*

This pattern is consistent with Mardhotillah et al. (2026), who compared syllable-card instruction with conventional teaching among 62 first-grade students. Their experimental group achieved higher post-test scores, supporting the use of structured card activities in beginning reading. The interventions are related but differ in emphasis: their study focused on syllable cards, whereas the present study examined picture word cards. The similarity therefore concerns the value of structured practice with reading units; it does not establish that the pictures themselves produced the advantage.

The experimental group also had a smaller post-test standard deviation than the control group, suggesting less variation in scores at the end of the study. This pattern is encouraging because the higher mean was accompanied by a narrower spread of scores. However, group summaries cannot show whether every student improved or whether students with lower starting scores benefited most. Such conclusions would require examination of individual pre-test and post-test results. The following quote illustrates how the larger increase in reading scores could be explained through the activities students completed.

> *Matching pictures with syllables and arranging them into words seemed to help students the most. Most of them could hold and move the cards themselves, and this made the learning process more concrete. … they usually found it easier to read. However, some students still needed examples and teacher guidance to make simple sentences.*

This example connects the score pattern with repeated opportunities to construct and read words. Moving the cards could make the sequence of syllables easier to examine, while reading the completed word could help connect the activity with print. The final sentence also qualifies the explanation: progress in reading individual words would not necessarily mean that students could already work independently with sentences. If the actual interview supports this account, it would help explain the quantitative advantage while identifying a remaining learning need.

Connecting pictures with written words and sounds

The quantitative advantage raises a further question about how picture-word cards may support early reading. One possible explanation is that a familiar picture helps students connect a spoken word and its meaning with an unfamiliar written form. The picture can provide an accessible starting point, while the teacher directs attention to the letters and sounds. This is a theoretical interpretation of the score pattern. The test results alone do not show which cognitive processes changed during learning.

Dual Coding Theory provides the main cognitive framework for this interpretation. Clark and Paivio (1991) describe verbal and nonverbal representations as distinct but interconnected systems. Applied to picture-word cards, the illustration can support a nonverbal representation of an object, while the printed word and its pronunciation support verbal representations. Learning may be supported when students form meaningful links between them. The theory therefore gives a specific explanation for the proposed role of pictures, rather than relying on the broad claim that visual media are attractive to young learners.

Sadoski and Paivio (2013) apply this framework to reading and writing, emphasizing relationships between language, imagery, and meaning. For beginning readers, a familiar image may make a word meaningful before its written form becomes easy to recognize. However, naming an object from a picture is different from reading its printed name. Instruction needs to bring students' attention back to the written word. Otherwise, a correct answer may reflect recognition of the image rather than recognition of the letters.

The findings also broadly agree with Lovita et al. (2025), who combined the Picture Word Inductive model with picture word cards among 42 second-grade students. Their experimental group achieved higher reading and writing scores than the comparison group. Both studies suggest that picture word cards can be useful within organized literacy activities. An important difference is that Lovita et al. examined a combined instructional model and assessed both reading and writing. Their results therefore support the broader instructional approach, but cannot isolate the contribution of picture word cards or establish the same cognitive process in the present study.

A more specific example of the proposed connection between pictures, sounds, and print appears in the following quote.

> *The picture gives students an initial clue for recognizing the word. For example, when they see a picture of a ball, they can immediately name the object. I then show the letters B-O-L-A …. In this way, students do more than memorize the written form; they connect a familiar picture with the letters and meaning of the word.*

In this example, bola is the Indonesian word for ball. The teacher begins with a familiar meaning and then directs attention to its written form and pronunciation. This sequence illustrates the links between nonverbal and verbal representations proposed by Dual Coding Theory. It also shows why teacher guidance matters: the picture supplies a meaningful context, but the teacher must still help students examine the letters. Even if confirmed by an authentic interview, this account would support a plausible explanation rather than directly demonstrate the cognitive process.

Initial reading ability and the need for different levels of support

Pre-test performance was strongly associated with post-test performance in the ANCOVA, $F(1, 65) = 132.7$, $p < .001$, partial $\eta^2 = .671$. This result indicates that students' starting reading scores remained relevant to their later achievement after group membership was included in the model. It also shows why the intervention should be considered alongside existing reading ability. Students entered the study with different levels of preparation, and the instructional materials did not remove the relevance of those differences.

The significant pre-test effect does not show that stronger readers gained more from the intervention. It describes an association between initial and final performance across the fitted model. Establishing whether the intervention worked differently at different starting levels would require an appropriate interaction analysis or examination of individual learning patterns. The present results therefore support attention to initial reading ability, while leaving differences in responsiveness to the intervention unresolved.

Ehri's (2020) account of word-reading development helps explain why starting ability may matter. Learning to recognize written words depends on knowledge of letter–sound relationships and the ability to connect sounds with spellings. A picture may help a student identify a word's meaning, but it does not supply all the skills needed to read that word independently. Students who are still learning letter sounds may require more explicit modeling and repeated practice than students who can already combine sounds into words.

This distinction has practical implications for the use of picture word cards. A teacher can use the same general material while adjusting the reading task. Students who need foundational support may work on identifying letters and blending sounds in short words. Students who are more secure can practice reading without pictures or apply familiar spelling patterns to new words. These are instructional implications drawn from the statistical association and reading theory; they are not demonstrated differences between subgroups in the present dataset.

The teacher's following response about differences in learning progress provides an example of how a teacher might explain the relevance of initial reading ability.

> *Not all students made the same progress. Students who already knew most of the letters usually combined syllables and arranged the vocabulary more quickly. Those who were still inconsistent in recognizing letters needed more repetition…. the picture cards helped them …. because they could begin with a picture they recognized.*

This account distinguishes access to the activity from the ability to complete the reading task quickly. A familiar picture could give a student a starting point even when letter recognition remains uncertain. The example is compatible with the continued association between pre-test and post-test performance, but it would not verify different treatment effects across readiness levels. In an integrated interpretation, the statistical result would establish the relevance of starting scores, while the teacher's account would explain the different kinds of support students appeared to need.

Teacher Guidance Engagement and Independent Reading

The group difference supports the use of the instructional approach implemented in the experimental condition, but it does not identify the independent contribution of each component. Picture word cards may be accompanied by additional practice, teacher feedback, or changes in how students participate. Without separate comparisons of these components, the observed advantage cannot be assigned to the illustrations alone. The relevant educational question is how the cards were used to support reading practice.

Previous research also shows that positive results are not automatic. Maulani and Salam (2026) examined picture word cards among 30 first-grade students and found improvement in both groups but no statistically significant difference between them, $p = .933$. This differs from the significant group effect in the present study. Differences in the participants, tasks, assessment, or implementation could help explain the contrasting results, but the available evidence does not establish which factor was responsible. The comparison limits any claim that picture word cards will consistently outperform other forms of instruction. The following quote describes how teacher guidance could connect the visual material with actual reading practice.

> *I usually ask students to name the picture first and then show them the initial letter. If they still find it difficult, I then pronounce the sound of each syllable and ask them to repeat it…. For example, at first, I give a complete model, but in the next exercise students receive only a picture clue or the initial letter.*

The example describes a gradual reduction in support. Its relevance to the quantitative result lies in the repeated movement from a familiar image toward attention to the written word. If the actual interview contains comparable evidence, the interpretation should attribute the improvement to the instructional approach as implemented, including the guidance that accompanied the cards. The account would not establish the effectiveness of each prompting step separately. Participation is another possible condition for learning, as illustrated by the following quote.

> *Compared with lessons that used only books or writing on the board, my students seemed to pay more attention when the picture cards were used. They were interested in guessing the pictures and arranging words with their friends. The students who were usually passive also began to answer, although some still followed their friends' answers.*

The qualification at the end is useful because visible participation does not necessarily show independent understanding. A student may join the activity or repeat a peer's answer without being able to read the word alone. If this pattern is confirmed in the interview, increased attention could be discussed as a teacher-perceived condition that supported opportunities to practice. It should not be presented as a measured mediator of the score improvement.

> *I noticed that some students could read words they had learned before even when the pictures were not shown. A few also began to read new words with simple syllable patterns. However, students with lower initial ability still tended to guess from the pictures. They could not always read new words independently, so they still needed practice without pictures.*

This example distinguishes recognition of practiced words from reading unfamiliar words. If supported by the authentic interview, it would suggest that the quantitative advantage coexisted with uneven independence in reading. The positive test result and the remaining difficulty could therefore be reported together. A teacher's account of transfer would still require cautious wording because the supplied quantitative results do not separately measure performance on familiar and unfamiliar words. The statement from the teacher identifies other factors that could contribute to the observed improvement.

> *During the study, students received more attention and more intensive practice than usual. They may also have been more enthusiastic because the material was new. Repeating words during the lessons could also have helped their scores…. the*

improvement should be seen as coming from a combination of the cards, practice, teacher guidance, and student participation.

This example provides an alternative to attributing the full advantage to the cards. It identifies additional attention, practice, and novelty as possible influences that would need to be considered in the authentic interview analysis. A retrospective account from one teacher can explain the classroom context, but cannot determine the separate contribution of these factors or directly establish what students were thinking.

Independent reading is an important boundary for interpreting the findings. A higher total test score does not, by itself, establish that students can read unfamiliar words, sustain fluent reading, or retain their learning over time. Ehri's (2020) framework suggests that attention to spelling–sound connections is necessary for increasingly independent word recognition. The instructional implication is to combine meaningful picture support with explicit reading practice and opportunities to read print after the picture has been removed. The supplied results do not establish whether such transfer or retention occurred.

The strongest conclusion supported by the quantitative evidence is that the experimental group achieved better early reading outcomes during the study, with a significant group difference after pre-test scores were taken into account. Dual Coding Theory offers a plausible account of how pictures and verbal information could work together, while word-reading theory explains the continued importance of letter–sound knowledge. The illustrative teacher accounts demonstrate how follow-up interview evidence could explain the classroom processes behind this advantage and identify remaining difficulties. Once replaced with authentic evidence, the integrated interpretation should connect the statistical result with the teacher's account of practice and support, while retaining any evidence of continued dependence on pictures or difficulty reading unfamiliar words.

CONCLUSION

This study found that picture word card instruction informed by cognitive learning theory was associated with stronger early reading performance among Grade I students at the participating school. Across four intervention sessions, the experimental group showed a larger mean increase in reading scores than the control group, with gains of 20.4 and 8.1 points, respectively. The reported ANCOVA also indicated a statistically significant group difference after accounting for pre-test performance. These findings support picture word cards as a promising resource within structured early reading instruction in this setting. The observed advantage concerns the instructional approach as implemented, including the cards, reading practice, and teacher guidance.

Initial reading performance remained strongly associated with post-test achievement, showing that students' starting knowledge continued to matter alongside the instructional condition. The findings therefore support considering visual materials together with the

foundational reading skills that students bring to classroom activities. Cognitive learning theory offers a plausible explanation for how familiar pictures may help connect meanings with written words when instruction directs attention to letters and sounds. This explanation remains interpretive because the study did not directly measure cognitive processes or isolate the contribution of individual instructional components. The study contributes contextual evidence of improved early reading outcomes while recognizing that higher test scores alone do not establish independent reading or equivalent benefits for all learners.

For classroom practice, the findings suggest combining picture word cards with explicit attention to letter–sound relationships, guided word reading, and repeated opportunities to engage with print. Support should reflect students' initial reading ability and include opportunities to read as picture cues are gradually reduced. The findings are bounded by purposive selection of 68 students from one school and a four-session intervention, which restrict their applicability to other settings and longer instructional periods. The quasi-experimental comparison and incomplete documentation of ANCOVA assumptions also require caution in interpreting the reported advantage. The available evidence does not establish the classroom mechanisms behind improvement, sustained learning, or transfer to unfamiliar words. Further research involving multiple schools, longer interventions, delayed assessments, and systematic classroom evidence would help clarify these outcomes and the conditions under which picture word cards support increasingly independent reading.

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