

Systematic Literature Review: The Effectiveness of PQ4R-Based E-LKPD on Elementary School Students' Reading Comprehension Skills

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ABSTRACT

Reading comprehension skills are essential in Indonesian language learning at the elementary school level, yet many students still struggle with inferential and evaluative aspects of comprehension. This study aims to analyze the effectiveness of PQ4R (Preview, Question, Read, Reflect, Recite, Review)-based e-LKPD in improving elementary school students' reading comprehension skills. The research employed a Systematic Literature Review (SLR) method. Articles were collected from Google Scholar and reputable national and international journals published between 2019 and 2025 using relevant keywords. The selection process followed inclusion and exclusion criteria and applied the PRISMA stages, resulting in 15 eligible articles for systematic analysis. The findings indicate that PQ4R-based e-LKPD consistently has a positive impact on students' reading comprehension skills, particularly in identifying main ideas, understanding textual meaning, making inferences, and enhancing learning engagement. The integration of e-LKPD facilitates the structured implementation of PQ4R stages in a more interactive, systematic manner than conventional printed worksheets. However, several challenges were identified, including limited technological infrastructure, teachers' readiness in developing digital teaching materials, and variations in students' digital literacy levels. In conclusion, PQ4R-based e-LKPD is an effective and innovative instructional tool for improving elementary school students' reading comprehension, provided adequate technological support and teacher training are available.

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1. INTRODUCTION

Reading comprehension is one of the essential language skills in the learning process, particularly at the elementary school level. Reading comprehension is the ability to understand the main ideas, important details, and the overall meaning of a text [1]. Dalman

explains that reading comprehension is the ability to understand the content of a text comprehensively, including the main ideas, word meanings, inferences, and the author's message [2]. In addition, Duke states that reading comprehension results from integrating information from the text with the reader's prior knowledge and the metacognitive strategies employed during reading [3]. Therefore, comprehension cannot be achieved if readers are unable to connect new information with their previous experiences or background knowledge. Hoover emphasizes that reading comprehension occurs when readers decode words while simultaneously understanding the relationships among ideas in a text [4]. Thus, reading comprehension is not merely the act of pronouncing words but involves active cognitive processes such as identifying main ideas, drawing conclusions, and critically evaluating the meaning of a text.

In Indonesian language learning at the elementary school level, reading comprehension is one of the core competencies that students are required to master. However, various studies indicate that upper-grade elementary students, including fifth-grade students, still experience difficulties, particularly in understanding implicit meanings and performing evaluative comprehension. Riani et al. report that fifth-grade students generally understand literal information but still face challenges with inferential and evaluative comprehension [5]. This finding is supported by Maryani et al., who state that students require guidance in interpreting implicit meanings and understanding the relationships among ideas within a text [6]. Furthermore, reading ability among upper-grade elementary students remains at a basic level, with only a small proportion reaching higher levels of comprehension [7]. This condition indicates that reading comprehension problems remain a systemic issue that requires appropriate instructional solutions. Based on these findings, the research problem in this study is the limited effectiveness of conventional instructional practices in facilitating higher-order reading comprehension skills, particularly inferential and evaluative comprehension, among elementary school students.

One factor influencing reading comprehension is the availability of instructional materials that facilitate structured reading and thinking. Njock et al. emphasize that systematically designed instructional materials can help students better understand texts, as students are guided not only to read but also to process information, connect meanings, and draw conclusions [8]. However, in practice, many instructional materials used in schools remain conventional. Based on preliminary observations and interviews with fifth-grade teachers at SDIT Iskandar Muda, the worksheets used are still in black-and-white print, are not integrated with specific reading strategies, and predominantly contain literal questions that do not adequately train students' inferential and evaluative abilities [9]. This condition causes students to have difficulty achieving deeper reading comprehension. Therefore, innovative instructional efforts are required to integrate structured reading strategies into more interactive learning media in order to address these limitations.

One reading strategy proven effective for improving reading comprehension is PQ4R (Preview, Question, Read, Reflect, Recite, Review). Oğuz and Arslan report that students who learned using the PQ4R strategy achieved higher post-test scores compared to those who received traditional instruction [10]. Other studies also indicate that implementing PQ4R effectively improves reading comprehension among elementary school students [11],

[12]. In addition, Saputra and Diana demonstrate that PQ4R-based instructional materials are valid, practical, and effective in improving elementary students' literacy skills [13], while Apreasta finds that PQ4R-based textbooks can enhance learning activity and reading comprehension among fifth-grade students [14]. PQ4R is considered advantageous because the reflect and recite stages encourage students to connect new information with prior knowledge and strengthen long-term retention through repetition [15]. As a result, this strategy enhances cognitive activity by training students to generate questions, seek answers, reflect on information, and review their understanding. However, most previous studies [10]–[14] have focused on the application of PQ4R in conventional or printed instructional materials and have not specifically examined its integration into digital worksheets (e-LKPD), thereby creating a research gap in the context of technology-based learning innovation.

On the other hand, developments in educational technology offer significant opportunities to develop digital instructional materials, such as electronic student worksheets (e-LKPD). e-LKPD offers advantages in terms of more attractive visual presentation, flexibility, and the inclusion of interactive activities that increase student engagement in learning [16]. Rahmayani and Atmazaki state that interactive e-LKPD can make learning more engaging and improve students' literacy skills through varied practice activities [17]. Nevertheless, the use of e-LKPD also presents challenges, such as reliance on internet connectivity and unequal access to digital devices across schools [18], [17]. However, in schools with adequate digital facilities, e-LKPD can serve as an effective solution for improving instructional quality. Previous studies on e-LKPD [16], [17] generally emphasize design feasibility and practicality, yet limited research systematically synthesizes its effectiveness when integrated with structured reading strategies such as PQ4R, especially at the elementary school level.

The integration of the PQ4R strategy into e-LKPD is considered to have greater potential for effectiveness, as each PQ4R stage can be facilitated through interactive digital features. The question stage can be presented through digital input fields, the read stage can be linked to interactive texts, and the reflect and recite stages can be supported through digital activities such as interactive notes, drag-and-drop tasks, or voice recordings. Nevertheless, previous studies have largely focused on the conventional application of PQ4R or the development of PQ4R-based printed instructional materials. As a result, studies examining the effectiveness of PQ4R-based e-LKPD on elementary students' reading comprehension skills remain limited and scattered across various publications. Therefore, a Systematic Literature Review (SLR) is needed to systematically examine existing research to obtain a comprehensive understanding of the effectiveness of PQ4R-based e-LKPD, its supporting factors, and implementation challenges. Through this SLR approach, the author plans to synthesize empirical findings from studies published between 2019 and 2025 to identify patterns of effectiveness, supporting variables, and research gaps, providing a basis for future instructional development.

Based on this background, this study aims to analyze the effectiveness of PQ4R-based e-LKPD on elementary school students' reading comprehension skills through a Systematic Literature Review approach. The objective of this research is to (1) identify the

impact of PQ4R-based e-LKPD on students' reading comprehension skills, (2) analyze supporting and inhibiting factors in its implementation, and (3) formulate recommendations for improving digital-based reading instruction in elementary schools. The findings of this study are expected to serve as an academic reference for teachers and researchers in developing innovative digital instructional materials that support more interactive and high-quality reading comprehension instruction. It is hoped that the results of this study will contribute theoretically to the development of reading comprehension learning models and practically to the improvement of instructional quality through the integration of digital technology and structured reading strategies.

2. METHOD

This study employed a Systematic Literature Review (SLR) approach, following the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) protocol [19]. The SLR approach was selected because it provides a comprehensive, objective, and transparent overview of trends and findings from previous studies relevant to the topic under investigation. This method aims not only to summarize prior research findings but also to identify patterns, research gaps, and future research directions within the context of Indonesian language learning at the elementary school level. The PRISMA model was applied to ensure that all research stages, from literature identification and screening to eligibility assessment and analysis, were conducted systematically and could be replicated by other researchers. PRISMA consists of four main stages: (1) identification, (2) screening, (3) eligibility, and (4) inclusion.

The data for this study were obtained from scientific articles published in nationally accredited journals and international journals accessible through online databases. The primary literature sources included Google Scholar, ERIC (Education Resources Information Center), and ResearchGate, as these databases provide broad coverage in the fields of education and language learning. The article search was conducted using a combination of Indonesian and English keywords to broaden the search results. Several keyword combinations were used, including "PQ4R," "reading comprehension," and "Indonesian language." The search was limited to publications from 2021 to 2025 to capture recent research developments within the context of the Merdeka Curriculum.

Table 1. Inclusion and Exclusion Criteria for Article Selection

Inclusion Criteria	Exclusion Criteria
Journal articles	Books and non-peer-reviewed publications
Full-text articles available for download	Full-text articles not available for download
Articles written in Indonesian or English	Articles written in languages other than Indonesian or English
Elementary school students	Participants other than elementary school students
Samples were conducted in Indonesia.	Samples conducted outside Indonesia
Experimental studies with control and experimental groups	Qualitative studies and development-only research
Indexed in SINTA and/or Scopus	Not indexed in SINTA and/or Scopus

To ensure the data's relevance and quality, this study applied strict inclusion and exclusion criteria. The inclusion criteria encompassed empirical research articles, literature studies, or review articles published in reputable scientific journals. Selected articles were required to focus on the implementation of the PQ4R strategy within the context of Indonesian language learning, particularly at the elementary school level. In addition, included articles had to be published between 2021 and 2025, be available in full-text format, and be written in either Indonesian or English. Conversely, exclusion criteria were applied to articles that discussed language-learning contexts other than Indonesian, did not clearly describe specific instructional strategies, were opinion-based or brief reports, or had not undergone peer review. The application of these criteria was intended to ensure that all analyzed literature was both relevant and scientifically reliable.

The article selection process followed the stages outlined in the PRISMA (2020) protocol [19]. During the identification stage, an initial search using various relevant keyword combinations yielded approximately 1,850 article titles from databases such as Google Scholar, ERIC, and ResearchGate. In the subsequent screening stage, titles and abstracts were reviewed to eliminate publications that were not aligned with the research focus, such as studies in fields outside language education or conducted at levels beyond elementary education. After this stage, the number of remaining articles was reduced to 260. The next stage, eligibility, involved a full-text review of the remaining 260 articles to assess their conformity with the inclusion criteria. Articles that did not explicitly explain the PQ4R strategy were excluded. Following a rigorous selection process at the inclusion stage, 10 final articles met all criteria and were used as the basis for data analysis and synthesis.

Data analysis was conducted using a qualitative descriptive approach with thematic synthesis. Each selected article was coded based on several key aspects, including year of publication, educational level and research context, research objectives and methods, forms of PQ4R strategy implementation, main findings, and implications for Indonesian language learning at the elementary school level. The analysis process involved several steps. First, data extraction was performed for each article using a literature analysis table to organize key information systematically. Second, the extracted data were grouped into themes that emerged from the data, such as improvements in language skills, development of student collaboration, and increased learning motivation. Third, the findings were synthesized by comparing similarities and differences across articles to identify general patterns and existing research gaps. To ensure the reliability of the analysis process, two researchers independently conducted the reading and coding procedures, after which the results were compared and jointly agreed upon to ensure data consistency and validity through inter-rater reliability.

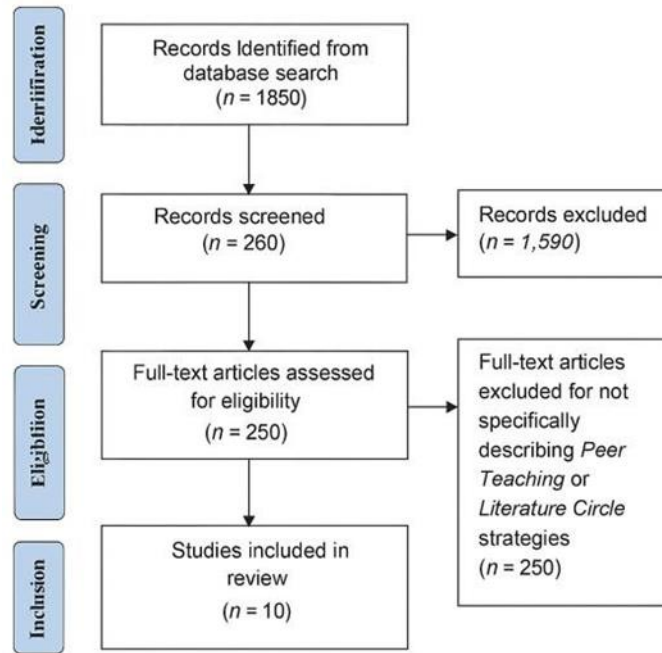


Figure 1. Flowchart

3. RESULTS AND DISCUSSION

Based on the selection flow illustrated in the PRISMA diagram, all stages from identification to eligibility assessment demonstrate a rigorous and systematic screening process. From the large number of articles identified during the initial search, several studies were excluded due to duplication, misalignment with the research focus, or failure to meet the established inclusion criteria, such as educational level, relevance to e-LKPD, and integration of the PQ4R strategy. At the final stage, 15 articles were deemed eligible for further analysis and subsequently served as the basis for mapping research trends, characteristics of e-LKPD development, and forms of PQ4R integration in Indonesian language learning at the elementary school level, as summarized in the following SLR table.

Table 2. Systematic Literature Review

No.	Author(s) & Year	Research Title / Focus	Method & Sample	Main Findings	Limitations
1	F. Istiqomah, A. Hasani, & O. Rosidin (2025)	Development of local wisdom-based digital instructional materials using the PQ4R method to improve fifth-grade students' reading comprehension	Research and Development (ADDIE); sample: Grade V students at SDN Panaragan	PQ4R-based digital materials were rated highly feasible and effective in improving reading comprehension with an N-Gain of 0.71 (high category)	Limited to one school and did not compare with other instructional methods
2	K. H. Primayana & P. Y. Angga Dewi (2025)	Effect of PQ4R assisted by Balinese folklore texts on elementary students' reading comprehension	Quasi-experimental; sample: 36 Grade IV students	PQ4R had a significant effect on reading comprehension compared to conventional	Small sample size and use of folklore texts only

No.	Author(s) & Year	Research Title / Focus	Method & Sample	Main Findings	Limitations
				instruction (Sig. 0.000 < 0.05)	
3	M. P. G. Camohoy, N. C. Osias, & G. G. Corpuz (2025)	Effect of PQ4R strategy on students' oral reading comprehension	Experimental: Grade IV students in the Philippines	PQ4R significantly improved oral reading comprehension and students' positive attitudes toward reading	Focused only on oral reading, not written comprehension
4	H. Puspita, D. P. Purwati, & N. S. Sabilillah (2025)	Development of narrative literacy flipbook media based on local wisdom using PQ4R	Research and Development (Borg & Gall); sample: 25 Grade IV students	PQ4R-assisted flipbook media effectively improved reading comprehension (N-Gain 0.80–0.81, high category)	Limited to narrative texts and one local cultural context
5	P. Widiyaningsih, N. Latifah, & C. O. Nia (2025)	PQ4R model assisted by Literacy Cloud in imaginative narrative reading instruction	Quasi-experimental pretest–post-test; sample: 52 Grade II students	PQ4R with Literacy Cloud was more effective than conventional methods in improving narrative reading skills	Dependence on internet access and students' digital readiness
6	A. Safitri, R. E. Sugiharti, & Y. Budianti (2025)	Application of PQ4R to improve elementary students' reading comprehension	Classroom Action Research; two cycles; Grade IV Students	Reading comprehension mastery increased from 60% (Cycle I) to 94% (Cycle II)	No control group and limited class scope
7	R. Kemala, M. Matin, & Y. Supriyati (2021)	Improving reading comprehension through PQ4R in Grade IV elementary students	Classroom Action Research (Kemmis & McTaggart); 38 students	Reading comprehension improved from 67% (Cycle I) to 80% (Cycle II)	Conducted in one class and without a control group
8	T. Oğuz & A. Arslan (2021)	Effect of PQ4R on reading comprehension, metacognition, self-efficacy, and retention	Mixed methods (quasi-experiment & case study); 35 Grade IV students	PQ4R had a strong effect on comprehension, metacognitive skills, self-efficacy, and memory retention	Limited sample and single regional context
9	A. Alvandi, D. Koya Hamida, Y. B. Jurahman, & R. S. Wardhani (2024)	Improving reading comprehension using PQ4R in Indonesian language learning	Classroom Action Research; 29 Grade IV students	Learning mastery increased from 57.1% (Cycle I) to 79.3% (Cycle II)	Focused only on narrative texts and the Indonesian language subject
10	C. Alvioni, N. P. Nuriyani, & M. Effa (2019)	Application of PQ4R to improve Grade III students' reading comprehension	Classroom Action Research; two cycles; 30 Grade III students	Reading comprehension improved from 26.7% (pre-cycle) to 86.7% (Cycle II)	Limited to lower grades and no comparison with other methods
11	R. A. Putra (2018)	Effect of PQ4R strategy on elementary students' reading comprehension	Experimental (one-group pretest–post-test); Grade V students	Average reading comprehension scores increased from 57.79 to 70.46	No control group; external influences not fully controlled
12	Anggraini et al. (2021)	Effect of PQ4R on elementary students'	Quasi-experimental (Nonequivalent	PQ4R produced significantly higher	Limited sample and conducted

No.	Author(s) & Year	Research Title / Focus	Method & Sample	Main Findings	Limitations
		reading comprehension skills	Control Group Design)	reading comprehension than KWL (Sig. 0.038 < 0.05)	during the pandemic
13	R. Saputra & N. Diana (2022)	Development of PQ4R-based reading strategy books with character education integration	Qualitative descriptive (literature study)	PQ4R effectively improved comprehension, critical thinking, and independent learning habits	Did not test effectiveness experimentally
14	W. Dihan et al. (2022)	Application of PQ4R to improve Grade VI students' reading comprehension	Classroom Action Research; two cycles; 20 students	Significant improvement in reading comprehension from Cycle I to Cycle II	Conducted in one class; limited generalizability
15	L. Apreasta (2023)	Development of PQ4R-based reading comprehension textbooks for Grade V	Research and Development (4-D model); 24 students	PQ4R-based textbooks were highly valid (85.23%), practical, and effective	Limited dissemination and single-school testing

Based on the Systematic Literature Review of 15 relevant research articles, the findings indicate that the PQ4R strategy (Preview, Question, Read, Reflect, Recite, Review) is consistently effective in improving elementary school students' reading comprehension. This effectiveness is evident across various research designs, including experimental, quasi-experimental, classroom action research, and instructional materials development.

Experimental research findings show that students who learned using the PQ4R strategy achieved higher reading comprehension than those in conventional instruction. Putra reported an increase in students' average reading comprehension scores following the implementation of PQ4R [20], while Anggraini et al. demonstrated that PQ4R was more effective than the KWL strategy [21]. These findings are consistent with the study by Oğuz and Arslan, who stated that PQ4R not only improves reading comprehension but also enhances students' metacognitive abilities and retention [10]. The effectiveness of structured reading strategies is also supported by research indicating that metacognition-based reading instruction significantly improves students' comprehension outcomes [23].

In classroom action research, the implementation of PQ4R was shown to improve mastery of reading comprehension progressively from one cycle to the next. Safitri et al. [12] and Kemala et al. [11] reported significant improvements in students' reading comprehension skills after instruction conducted through the systematic PQ4R stages. These results indicate that the PQ4R strategy is effectively applicable in regular classroom learning contexts. Similar findings were reported in broader literacy studies demonstrating that explicit comprehension strategy instruction contributes to measurable gains in elementary students' reading performance [24].

Findings from development research further indicate that PQ4R-based instructional materials and learning devices, both printed and digital, are considered valid, practical, and effective. Apreasta found that PQ4R-based textbooks increased learning activity and reading

comprehension among fifth-grade students [14], while Istiqomah et al. reported that PQ4R-based digital instructional materials led to high-level improvements in reading comprehension skills [22]. These findings suggest that integrating PQ4R into instructional materials can facilitate a more structured reading process. The integration of digital technology in literacy instruction has also been shown to enhance engagement and comprehension when combined with guided strategy use [25].

From a theoretical perspective, these findings align with the view of reading comprehension as an active cognitive process that involves integrating textual information with the reader's prior knowledge [2], [3], [4]. The preview and question stages help students build initial schemata, while the reflect, recite, and review stages encourage students to connect information, draw conclusions from the text, and strengthen comprehension retention. This process aligns with the perspective of Rico-Juan et al., who argue that reading comprehension includes the ability to grasp main ideas, important details, and the overall meaning of a text [1].

The integration of the PQ4R strategy into e-LKPD is expected to strengthen the effectiveness of reading comprehension instruction further. e-LKPD enables the presentation of more interactive and varied reading activities, allowing students to move beyond literal comprehension toward inferential and evaluative comprehension. This finding is consistent with studies by Rahmi [16] and Rahmayani and Atmazaki [17], which indicate that interactive digital instructional materials can enhance student engagement and literacy skills.

Nevertheless, the review also reveals that most existing studies have been conducted on a limited scale and have not yet comprehensively examined the broader implementation of PQ4R-based e-LKPD. Therefore, this study emphasizes that PQ4R-based e-LKPD holds substantial potential as an innovative solution to improve reading comprehension instruction in elementary schools, particularly by supporting more active, reflective, and meaningful learning experiences.

4. CONCLUSION

Based on the Systematic Literature Review, the integration of the PQ4R strategy into e-LKPD represents a pedagogically meaningful approach to strengthening elementary school students' reading comprehension. The synthesis of selected studies indicates that combining structured reading stages with interactive digital features creates a learning environment that supports deeper cognitive processing, student engagement, and more systematic comprehension development. Overall, the reviewed literature positions PQ4R-based e-LKPD as a promising instructional innovation for addressing persistent challenges in elementary reading instruction.

From a practical perspective, this study implies that teachers and schools should consider integrating structured reading strategies with digital learning media to optimize reading instruction. Teacher training in designing strategy-based e-LKPD and institutional support in providing adequate technological infrastructure are essential for effective implementation. Theoretically, this study reinforces the importance of combining cognitive reading strategies with digital pedagogy to enhance comprehension outcomes.

However, this review is limited to articles published between 2019 and 2025 and sourced primarily from Google Scholar and selected national and international journals. The findings are also restricted to elementary school contexts and depend on the methodological quality of the reviewed studies.

Future research is recommended to conduct large-scale empirical investigations, involve more diverse educational settings, and examine the integration of PQ4R-based e-LKPD with higher-order thinking skill assessments and longitudinal designs. This study contributes to the broader educational community by providing a synthesized reference for developing innovative, technology-integrated reading instruction that supports improved literacy outcomes among elementary school students.

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