

Research Article

Mapping Reading Literacy Research in Primary Education: A Systematic Review

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ABSTRACT

Reading literacy is a foundational competency in primary education, yet research on its development is distributed unevenly across cognitive, affective, instructional, and contextual dimensions, particularly in literature published after the COVID-19 disruption. This systematic review integrates research characteristics, contextual factors, and evaluated interventions within a single PIRLS-based framework. Peer-reviewed studies published between 2021 and 2026 were retrieved from Scopus and screened using prespecified eligibility criteria, with reporting guided by PRISMA 2020. Of 107 records initially identified, 29 studies were included. The studies were mapped according to (1) methodological, geographical, and publication characteristics; (2) contextual factors associated with reading literacy at student, home, school/classroom, and national/community levels; and (3) instructional approaches and literacy programs evaluated in primary education. The corpus was dominated by quantitative and intervention-oriented designs, with research attention concentrated at the student and school/classroom levels. Intervention studies most frequently examined classroom-based approaches, whereas home- and system-level initiatives were less common. Because no formal risk-of-bias appraisal or meta-analysis was undertaken, the findings are interpreted descriptively rather than as comparative estimates of intervention effectiveness. The review highlights the need for more transparent, multi-level, and context-sensitive literacy research, including work in underrepresented settings.

Keywords: Literacy Intervention; Primary Education; PIRLS Framework; Reading Literacy; Systematic Literature Review.

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1. Introduction

Reading literacy is widely regarded as a foundation for subsequent academic learning, particularly during the first years of formal schooling, when children move from “learning to read” toward “reading to learn” (Walgermo et al., 2018). Beyond academic attainment, literacy skills are also associated with longer-term social participation and lifelong learning (Vera-Toscano et al., 2017). International large-scale assessments such as the Programme for International Student Assessment (PISA) and the Progress in International Reading Literacy Study (PIRLS) have drawn sustained attention to inequalities in reading proficiency. In South Africa, for example, PIRLS data show a marked decline in Grade 4 reading outcomes between 2016 and 2021, together with widening inequality (Böhmer & Wills, 2025).

The urgency of this issue was intensified by COVID-19-related disruptions to schooling. Evidence from the broader education literature documented substantial learning loss after school closures (Engzell et al., 2021), while large-scale reading analyses included in this review identified measurable declines in Grade 4 reading

achievement and substantial variation across education systems (Ludewig et al., 2022, 2025). At the same time, intervention studies have reported promising recovery-oriented approaches, including a cluster-randomized program in Afghanistan (Trani et al., 2025) and an integrated foundational-literacy model in Indonesia (Iswara et al., 2026). These contrasting patterns of decline and intervention response provide a strong rationale for synthesizing what recent literature reports about reading literacy in primary education.

Recent empirical work has developed along several partially disconnected lines of inquiry. One strand examines student-level characteristics, including reading interest, motivation, fluency, and metacognitive processes (Dewani et al., 2024; Heyne & Hermann, 2025; Michalsky & Bakrish, 2024; Mutema & Pretorius, 2024). A second focuses on the home literacy environment and parental involvement (Alramamneh et al., 2023; Graham & Mtsweni, 2025). A third investigates classroom and school practices, ranging from phonics and guided reading to strategy instruction and school-wide literacy programs (Gabriel & Mpofu, 2024; van der Mescht, 2023; Yan & Cai, 2022). A fourth examines technology-mediated and gamified learning (Min & Seo, 2024; Soboleva et al., 2024; Zhekeyeva et al., 2026). Although each strand provides useful evidence, their separation makes it difficult to compare where research attention is concentrated and how findings from different contextual levels can be interpreted together.

Despite this breadth, the evidence remains difficult to integrate because studies frequently emphasize dimensions or settings. Work on environmental influences (Ghani et al., 2022) and foundational decoding in low- and middle-income countries (Crawford et al., 2025), for example, illustrates the value of context-specific inquiry but does not by itself integrate research trends, multi-level contextual factors, and intervention evidence within one analytical structure. A systematic mapping that places heterogeneous findings within a common primary-education framework is therefore useful, particularly for literature published during 2021–2026.

To provide a common organizing structure, this review adopts the conceptual framework developed for the Progress in International Reading Literacy Study (PIRLS). The PIRLS framework conceptualizes reading literacy through purposes for reading, including literary experience and acquiring and using information, as well as the comprehension processes involved in constructing meaning from text (Mullis et al., 2023). It also situates reading outcomes within a nested context model encompassing national/community, home, school/classroom, and student characteristics. This structure allows heterogeneous factors and interventions to be mapped within a widely used reading literacy framework while preserving distinctions among contextual levels.

Guided by this framework, the review addresses three research questions: (1) How have reading literacy studies in primary education been characterized in terms of research design, geography, and publication trends? (2) What contextual factors are associated with reading literacy outcomes among primary school students? (3) What interventions and instructional strategies have been evaluated or reported to support reading literacy in primary schools?

2. Method

This study used a systematic literature review design. Reporting was guided by the PRISMA 2020 statement (Page et al., 2021), which provides reporting guidance for systematic reviews rather than a review protocol. The review was designed to synthesize heterogeneous empirical studies across research designs, countries, and publication years while applying explicit procedures for study selection and synthesis (Xiao & Watson, 2019).

2.1 Search Strategy

A structured search was conducted in Scopus because of its broad indexing of peer-reviewed educational research and its coverage of PIRLS-related studies. Scopus was used as the sole database; therefore, relevant studies indexed only in ERIC, Web of Science, or other sources may have been missed. The search was deliberately construct-specific. The exact phrase “reading literacy” was combined with “elementary school” or “primary school” to prioritize studies that explicitly framed the outcome as reading literacy rather than broader reading constructs. The conceptual query, applied to titles, abstracts, and keywords, was TITLE-ABS-KEY (“reading literacy” AND (“elementary school” OR “primary school”)). Results were restricted to peer-reviewed English-language journal articles published from 2021 through 2026. This narrow strategy improves construct specificity but may reduce search sensitivity; this limitation is considered when interpreting the scope of the review. The initial search yielded 107 records.

2.2 Inclusion and Exclusion Criteria

Eligibility criteria were prespecified before screening so that all records were assessed against the same topic, educational-level, article-type, language, access, publication-status, and duplication requirements (Xiao & Watson, 2019). Table 1 summarizes these criteria.

Table 1. Inclusion and exclusion criteria

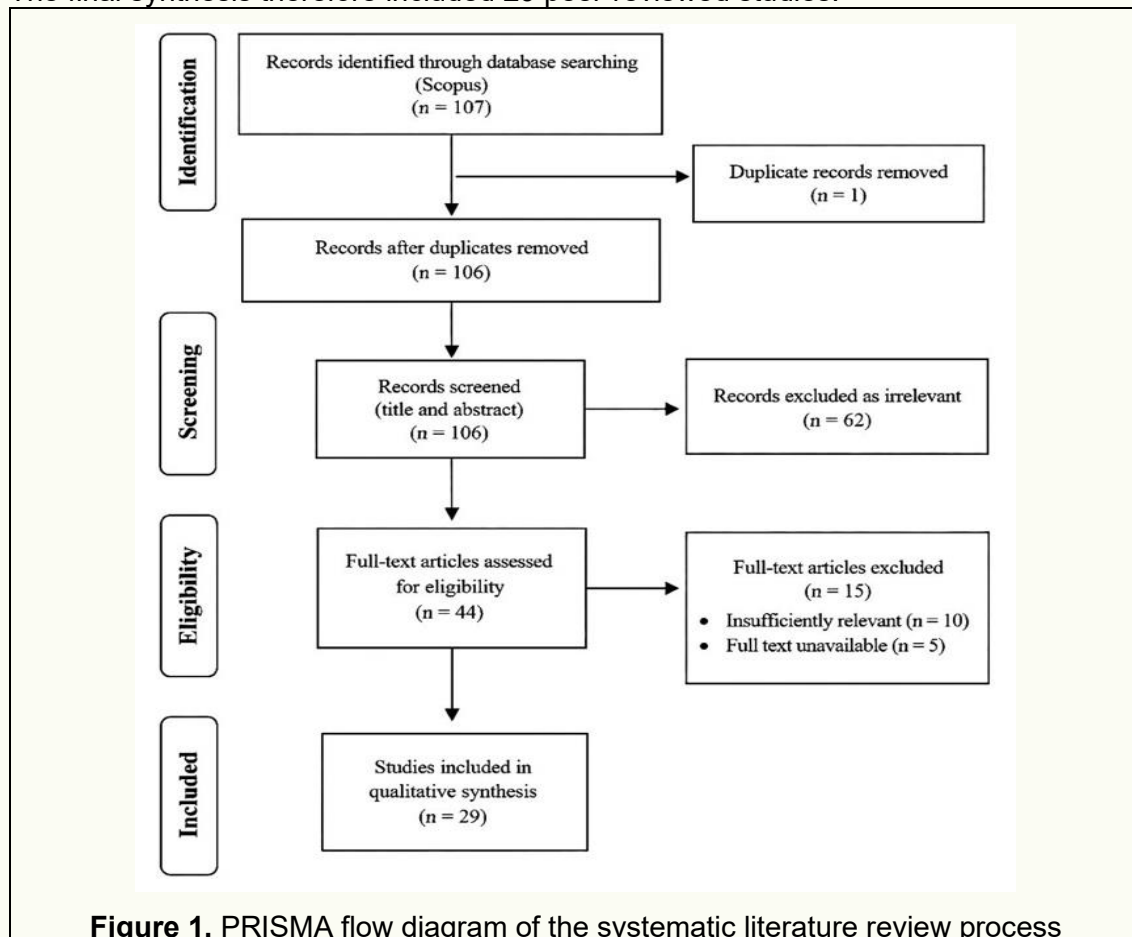
Criterion	Inclusion	Exclusion
Publication year	2021–2026	Outside this range
Topic	Reading literacy in primary/elementary education	Digital literacy, financial literacy, science literacy without explicit reading literacy focus
Educational level	Primary/elementary school students, teachers, programs	Pre-school, secondary, or higher education without primary-level data
Article type	Empirical research (quantitative, qualitative, mixed methods, experimental, action research, survey, case study, program evaluation)	Literature reviews, systematic reviews, scoping reviews, meta-analyses, conceptual papers, editorial letters
Language	English	Other languages
Access	Full text available	Full text unavailable
Publication status	Peer-reviewed journal articles	Conference proceedings, theses, book chapters, grey literature
Duplication	Unique articles only	Duplicate records

Note. Criteria were finalized before the screening phase commenced.

Full-text availability was required because final eligibility assessment depended on information not consistently reported in abstracts. Records without accessible full text were therefore excluded at the eligibility stage. This decision ensured a consistent depth of assessment but may have introduced availability bias, particularly against subscription-only or otherwise inaccessible publications.

2.3 Selection Process

The selection process followed the identification, screening, eligibility, and inclusion stages summarized in Figure 1. The Scopus search yielded 107 records. After one duplicate was removed, 106 titles and abstracts were screened against the prespecified criteria, and 62 records were excluded as irrelevant. Forty-four articles proceeded to full-text eligibility assessment. Fifteen were excluded at this stage: 10 did not meet the review's substantive relevance criteria and five were unavailable in full text. The final synthesis therefore included 29 peer-reviewed studies.



2.4 Data Extraction

A structured data-extraction matrix was used to record information consistently across the included studies (Büchter et al., 2021). Extracted fields included author(s), publication year, country, research design and method, sample characteristics and grade level, findings relevant to the three research questions, recommendations reported by the primary-study authors, and a concise synthesis statement. The completed matrix for all 29 studies is presented in Table 2.

2.5 Analytical Framework

The included studies were analyzed thematically and mapped against the PIRLS framework (Mullis et al., 2023). The PIRLS context model provided the organizing structure for classifying reported factors and interventions at student, home, school/classroom, and national/community levels. Thematic analysis proceeded in two iterative passes: first, each study's reported factors and interventions were assigned to

one or more contextual levels; second, recurring patterns were identified within and across those levels. Methodological characteristics were summarized descriptively using frequency counts by research design, publication year, and country. Given the review's mapping purpose and the heterogeneity of the included designs, no formal risk-of-bias or methodological-quality instrument was applied. Accordingly, the synthesis is descriptive, and causal or effectiveness language is reserved for studies whose designs directly support such inferences. The absence of formal quality appraisal limits confidence in cross-study comparisons and is considered in the interpretation of findings.

3. Results

3.1 Overview of Included Studies

The final corpus comprised 29 peer-reviewed articles published between 2021 and 2026. Table 2 presents the complete data-extraction matrix for the included studies, and Table 3 summarizes their distribution by publication year and research design.

Table 2. Final data extraction of included studies on reading literacy in primary education (2020–2026)

Author & Year	Country	Research Design	Sample/ Grade	Main Findings	Synthesis
Mah et al. (2021)	Singapore	Quantitative correlational	225 bilingual students	Digital technology use predicted reading performance	Digital engagement supports literacy
Wang et al. (2021)	China	Action research	10 libraries ; 11 schools ; 127 families	Collaborative reading environment improved literacy	Community support benefits literacy
Hu et al. (2022)	61 countries	SVM + PIRLS secondary	183,428 Grade 4 students	20 contextual factors differentiated reading performance	Reading literacy shaped by multilevel factors
Canquiz-Rincón et al. (2021)	Colombia	Mixed methods	132 students; 12 teachers	Didactic plans did not develop inferential reading sufficiently	Pedagogical quality influences outcomes
Hugo (2021)	South Africa	Non-experimental observational	36 teachers	Teachers lacked flexibility in reading methods	Teacher expertise affects literacy quality
Ludewig et al. (2022)	Germany	Longitudinal panel	4,290 Grade 4	Reading achievement declined during the pandemic	External disruptions affect literacy

			student s		
Yan & Cai (2022)	Singapore	Multilevel SEM	6,327 student s; 356 teacher s	Reading strategy instruction improved literacy	Teacher practices influence literacy
Alramamneh et al. (2023)	UAE	SEM	Grade 4 student s	Parental attitudes & early literacy activities improved scores	Family support enhances achievemen t
Nurmahani (2023)	Indonesia	Quasi- experimental	350 student s; 150 teacher s	Literacy program improved comprehension, vocabulary, fluency	Combined intervention s are effective
Mtambo & Tshuma (2023)	South Africa	Program evaluation	Grades 4–6 learner s	Reading improvement program produced literacy gains	Structured programs improve achievemen t
Van Der Mescht (2023)	South Africa	Ethnographic	3 Grade 1 teacher s	Excessive phonics reduced comprehension opportunities	Instructional balance is essential
Gabriel & Mpofu (2024)	Namibia	Secondary qualitative	Grade 3 teacher s	Phonics + shared reading + reading corners supported literacy	Foundational instruction essential
Abildina et al. (2024)	Kazakhstan	Quantitative survey	64 respon dents	Modern techniques improved reading literacy	Innovative pedagogies support growth
Dewani et al. (2024)	Indonesia	Correlational	78 Grade 4 student s	Motivation & attention correlated with literacy	Affective factors influence outcomes
Min & Seo (2024)	United States	Multilevel PIRLS	Grade 4 student s	Device use showed mixed effects on achievement	Technology effects depend on context
Soboleva et al., (2025)	Russia	Experimental	68 Grade 2	Book-trailer projects improved literacy	Digital media supports literacy

			student s		
Mutema & Pretorius (2024)	Zimbabwe	Quantitative correlational	374 Grade 3–4 student s	Oral reading fluency correlated with comprehension	Foundational skills underpin achievement
Janssen et al. (2024)	24 countries	Cross-national multilevel	Grade 4 student s	Preschool participation benefited disadvantaged students	Early education supports literacy
Illøkken et al. (2024)	Nordic countries	Secondary PIRLS	17,161 student s	Regular breakfast associated with higher literacy	Health behaviors influence literacy
Asdar et al. (2024)	Indonesia	Quantitative cross-sectional	400 student s	ICT-supported instruction improved reading & digital literacy	Technology-enhanced learning promotes literacy
Michalsky & Bakrish (2024)	Israel	Experimental intervention	65 Grade 5 student s	Metacognitive questioning improved reading performance	Metacognitive support enhances outcomes
Nandee et al. (2024)	Thailand	Pretest-posttest experimental	24 Grade 2 student s	Active learning improved reading literacy	Student-centered learning enhances achievement
Trani et al. (2025)	Afghanistan	Cluster RCT	2,519 student s Grades 3 & 5	Intervention improved literacy, life skills, self-efficacy	Holistic interventions improve outcomes
Ludewig et al. (2025)	18 European countries	PIRLS secondary; propensity score	187,386 Grade 4 student s	Reading literacy declined post-COVID-19 closures	Disruptions negatively affect literacy
Graham & Mtsweni (2025)	South Africa	Sequential explanatory mixed methods	1,025 Grade 4 student s; 10 parents	Parental involvement predicted reading literacy	Home environment supports achievement
Heyne & Hermann (2025)	Germany	Quasi-experimental	105 student s	Reading motivation enhanced	Motivation contributes to literacy

			Grades 3–4	empathic comprehension	
Iswara et al. (2026)	Indonesia	Mixed-methods sequential explanatory	90 students; 9 teachers	READI model improved phonemic awareness, fluency, comprehension	Integrated approaches improve literacy
Zhekeyeva et al. (2026)	Kazakhstan	Quasi-experimental pretest-posttest	100 Grade 4 students	Gamified digital exercises improved literacy & motivation	Gamification supports achievement
Melindawati et al. (2026)	Indonesia	Predictive correlational (SEM)	105 teachers	GLS strengthened reading habits and literacy culture	School-wide programs support literacy

Note. RCT = Randomized Controlled Trial; SEM = Structural Equation Modeling; SVM = Support Vector Machine; GLS = Gerakan Literasi Sekolah (School Literacy Movement); READI = Reading Engagement and Development Initiative; PIRLS = Progress in International Reading Literacy Study.

Table 3. Summary of included studies by year and research design

Category		Frequency (n)	Percentage (%)
Publication year			
	2021	4	18.8
	2022	3	10.3
	2023	4	13.8
	2024	10	34.5
	2025	5	17.3
	2026	3	10.3
Research design	Quantitative (correlational, survey, cross-sectional)	7	24.1
	Experimental / Quasi-experimental	8	27.6
	Secondary data analysis (incl. PIRLS)	7	24.1
	Mixed methods	3	10.3
	Qualitative / Ethnographic	3	10.3
	Program evaluation / Action research	1	3.4
Total		29	100

Note. Studies employing PIRLS secondary data are counted separately given the large-scale, cross-national nature of the dataset.

3.2 RQ1: Research Characteristics and Publication Trends

The 29 studies span six publication years (2021–2026), with the largest concentration in 2024 (11 studies; 37.9%). This distribution is reported descriptively; the review design does not establish whether the concentration was caused by pandemic-related research activity, publication lag, database coverage, or other factors. The earliest studies in the corpus were published in 2021, including Mah et al. (2021), whereas the most recent studies were published in 2026 (Iswara et al., 2026; Melindawati et al., 2026; Zhekeyeva et al., 2026).

Geographically, the corpus includes single-country studies from diverse regions together with several cross-national analyses. Indonesia contributed five studies (Asdar et al., 2024; Dewani et al., 2024; Iswara et al., 2026; Melindawati et al., 2026; Nurmahanani, 2023), and South Africa contributed four (Graham & Mtsweni, 2025; Hugo, 2021; Mtambo & Tshuma, 2023; van der Mescht, 2023), together accounting for 31.0% of the corpus. Cross-national studies included Hu et al. (2022), which analyzed data from 61 countries/regions; Ludewig et al. (2025), which examined 18 European education systems; Janssen et al. (2024), which drew on data from 24 countries; and Illøkken et al. (2024), which analyzed Nordic PIRLS data. The distribution therefore provides broad but uneven geographic coverage and should not be interpreted as a representative estimate of global research activity.

Research designs were heterogeneous. Experimental and quasi-experimental studies comprised eight studies (27.6%); secondary analyses of PIRLS or other large-scale datasets comprised seven (24.1%); quantitative correlational, survey, and cross-sectional studies comprised six (20.7%); mixed-methods studies comprised four (13.8%); qualitative or ethnographic studies comprised three (10.3%); and program evaluation/action research comprised one (3.4%). These categories are used for descriptive mapping rather than as indicators of evidence quality. Sample sizes ranged from 24 students (Nandee et al., 2024) to 183,428 students across 61 countries/regions (Hu et al., 2022).

3.3 RQ2: Contextual Factors Influencing Reading Literacy

Consistent with the nested PIRLS context model, factors reported across the 29 studies were mapped to four contextual levels. Research attention was unevenly distributed, with student/individual and school/classroom factors receiving more direct attention than home/family and national/community factors.

Student-level factors. At the individual level, several studies reported associations involving reading interest, motivation, fluency, and metacognitive processes. Dewani et al. (2024), in a correlational study of 78 Grade 4 students in Indonesia, found that reading interest was positively associated with reading literacy. Heyne and Hermann (2025) reported associations between motivational characteristics and empathic comprehension and transportation among Grades 3–4 students in Germany; their study does not justify treating motivation as an experimentally manipulated cause. Mutema and Pretorius (2024) found a strong association between oral reading fluency and comprehension among Grade 3–4 learners in Zimbabwe. In contrast to these observational studies, Michalsky and Bakrish (2024) evaluated a metacognitive-questioning intervention with Grade 5 students and reported improved task performance and judgment-of-learning calibration. Taken together, the studies indicate that multiple student-level characteristics are related to reading outcomes, although the strength of causal inference differs by design.

Home and family factors. Graham and Mtsweni (2025) found that parental involvement was a significant predictor of Grade 4 reading literacy in South Africa.

Alramamneh et al. (2023), using structural equation modeling in the United Arab Emirates, reported positive associations between parental attitudes toward reading, early literacy activities, and Arabic reading literacy. Wang et al. (2021), through action research in China, reported that collaboration among schools, libraries, and families supported the development of a sustained reading environment. Hu et al. (2022), using machine-learning analysis of PIRLS data from 61 countries/regions, identified home literacy resources and parental education among the contextual variables that distinguished higher- and lower-performing readers. These findings consistently identify home-related variables as relevant correlates or components of literacy development, although relatively few studies directly evaluated home-focused interventions.

School and classroom factors. This was the most densely represented contextual level. Yan and Cai (2022), using multilevel structural equation modeling with 6,327 students and 356 teachers in Singapore, found that reading-strategy instruction positively predicted reading literacy achievement. Hugo (2021) reported limited flexibility in teachers' use of reading methods across three South African provinces. In an ethnographic study, van der Mescht (2023) found that heavy emphasis on phonics within group-guided reading could restrict opportunities for meaning-focused and higher-order comprehension work. At the school-program level, Melindawati et al. (2026) reported that participation in Indonesia's School Literacy Movement was associated with stronger reading habits and literacy culture. Canquiz-Rincón et al. (2021) further found that instructional planning documents in Colombia did not sufficiently support inferential reading development. Collectively, these studies show substantial attention to school and classroom practices, but the evidential strength varies across predictive, qualitative, and intervention-oriented designs.

National and community factors. Ludewig et al. (2022) documented a decline in Grade 4 reading achievement in Germany during the COVID-19 period. In a later cross-national analysis, Ludewig et al. (2025) found reading declines across 18 European education systems and related variation in those declines to school-closure duration and out-of-school learning conditions. Illøkken et al. (2024), analyzing PIRLS data from 17,161 Nordic students, identified a positive association between regular breakfast consumption and reading literacy; because the study was observational, this association should not be interpreted as a causal effect of breakfast or health policy. Hu et al. (2022) identified national-level characteristics, including socioeconomic and language-related variables, among the features that discriminated reading-performance groups across 61 countries/regions. Together, these studies indicate that broader contextual conditions are associated with reading outcomes, while leaving causal mechanisms open for further investigation.

3.4 RQ3: Instructional Approaches, Interventions, and Literacy Programs

The instructional approaches and literacy programs documented across the corpus were grouped into five thematic clusters for synthesis. Because designs and outcome measures were heterogeneous and no formal quality appraisal or meta-analysis was conducted, these clusters are interpreted as patterns of reported evidence rather than as a ranking of intervention effectiveness.

Integrated and model-based literacy programs. Iswara et al. (2026) evaluated the READI model in Indonesia, combining phonemic-awareness activities, fluency development, and comprehension strategies within an engagement-oriented framework, and reported improvements across the targeted literacy dimensions. Nurmahanani (2023), in a quasi-experimental study involving 350 students and 150 teachers, reported gains in comprehension, vocabulary, and oral reading fluency following a multicomponent literacy program. Mtambo and Tshuma (2023), however, reported mixed

school-level outcomes in their evaluation of a South African reading-improvement program: performance increased in three schools, remained unchanged in two, and declined in one. These findings show that multicomponent programs can produce positive outcomes but should not be treated as uniformly effective across settings.

Technology-mediated and gamified approaches. Zhekeyeva et al. (2026) reported that gamified digital exercises improved reading-literacy and motivational outcomes compared with conventional instruction in Kazakhstan. Soboleva et al. (2024) evaluated book-trailer media-design activities with Grade 2 students in Russia and reported improvements in reading-literacy outcomes. By contrast, Asdar et al. (2024) reported positive associations between ICT-supported instruction and reading/digital literacy in a cross-sectional design, while Min and Seo (2024) found that frequent at-home device use was generally associated with lower reading achievement, with patterns differing across student subgroups. The corpus therefore does not support treating digital exposure itself as inherently beneficial; outcomes vary with the activity, population, and research design.

Metacognitive and strategy-based instruction. Michalsky and Bakrish (2024) evaluated a six-session metacognitive-questioning intervention with Grade 5 students and reported improvements in task performance and judgment-of-learning calibration. Yan and Cai (2022), using multilevel structural equation modeling, found that teachers' reading-strategy instruction positively predicted student reading literacy across the sampled classrooms. Together, these studies suggest potential value in metacognitive and strategy-oriented support, while also illustrating the need to distinguish intervention effects from predictive associations.

Foundational skills instruction. Gabriel and Mpofu (2024) qualitatively documented teachers' use of phonics, shared reading, and reading-corner activities in selected Namibian primary schools; the study described instructional practice rather than testing learner-level treatment effects. Mutema and Pretorius (2024) found a strong association between oral reading fluency and comprehension in Grades 3 and 4. Van der Mescht (2023), through ethnographic analysis, cautioned that disproportionate emphasis on phonics could limit opportunities for inferential and evaluative comprehension. Taken together, these studies provide a rationale for balancing foundational and meaning-focused literacy work, but the corpus does not directly test the comparative effectiveness of a balanced approach against a single instructional method.

Holistic and multi-stakeholder programs. Trani et al. (2025) conducted a cluster-randomized controlled trial with 2,519 students in rural Afghanistan and reported gains in reading, life skills, and self-efficacy following a participatory intervention that combined school, family, and community components. Wang et al. (2021) reported sustained development of a reading environment through school-family-library collaboration in China. Graham and Mtsweni (2025) and Alramamneh et al. (2023) provided complementary evidence that parental and home-literacy variables were associated with reading outcomes. These studies point to the relevance of multi-stakeholder involvement, although randomized causal evidence within this cluster is limited primarily.

4. Discussion

The findings, organized around the three research questions and mapped against the PIRLS context model, reveal several patterns while also showing why the strength of claims must be calibrated to study design.

Publication concentration after 2020 should be interpreted cautiously. The largest share of included studies appeared in 2024 (11 of 29; 37.9%), but because the review begins in 2021 and relies on one database, this pattern cannot establish a pandemic-driven increase in research output. What the corpus shows more directly is continued attention to pandemic-related learning outcomes: Ludewig et al. (2022, 2025) documented declines in reading achievement in Germany and across European education systems. More recent corpus studies also include intervention-oriented designs, indicating that the evidence base contains both diagnostic and response-focused work.

Geographic coverage is broad but uneven. Indonesia and South Africa account for nine of the 29 included studies, whereas contexts such as Afghanistan and Zimbabwe appear only once. Because the corpus is constrained by Scopus indexing, English-language publication, full-text availability, and a construct-specific search, this distribution should not be treated as a measure of national research capacity or publishing access. Instead, it identifies where the evidence captured by this review is concentrated and where broader searching or additional primary research may be warranted.

Multi-level determinants were identified, but research attention was uneven across levels. Student-level and school/classroom factors received the greatest direct attention, while home/family and national/community factors were less frequently the primary focus. Hu et al. (2022) showed that macro-level characteristics were among the variables that strongly discriminated reading-performance groups in a cross-national machine-learning analysis. This result supports broader attention to system-level conditions, but it does not establish that such variables have greater causal weight than classroom-level factors. The pattern is nevertheless consistent with calls to avoid explaining educational inequality solely through individual differences while overlooking systemic conditions (Zengilowski et al., 2023).

The home literacy environment emerges as an important but comparatively underexamined intervention site. Graham and Mtsweni (2025) and Alramamneh et al. (2023) reported consistent associations between home-related variables and reading outcomes, while Wang et al. (2021) described an action-research model that incorporated families into a broader reading environment. These studies do not establish a single universal home-literacy effect, but their convergence across contexts supports treating home conditions as a substantive component of multi-level literacy research. This interpretation is consistent with the extended home-literacy model, which distinguishes informal shared-reading practices from more formal literacy instruction provided by parents (Inoue et al., 2018).

The instructional-balance question is better framed as convergence than as comparative proof. Evidence in this corpus suggests that foundational decoding and fluency, comprehension and meaning-focused work, motivation, and self-regulatory processes can all contribute to reading development, but the included studies do not directly compare every component within a common experimental design. The longstanding distinction between code-focused and meaning-focused instruction therefore should not be reduced to a single-method contest (Sanabria et al., 2024). This interpretation is compatible with the Simple View of Reading, which emphasizes both decoding and linguistic comprehension (Hoover & Tunmer, 2018), and with broader science-of-reading synthesis that treats reading development as supported by multiple interacting components (Petscher et al., 2020). Mutema and Pretorius's (2024) fluency-comprehension association and Michalsky and Bakrish's (2024) metacognitive intervention further indicate that efficient word-level processing and self-regulatory

processes deserve attention alongside comprehension instruction (Chen et al., 2025; Skibbe et al., 2019).

Digital technology shows mixed, design-dependent evidence rather than a uniformly positive effect. Zhekeyeva et al. (2026) and Soboleva et al. (2024) reported gains from structured gamified or media-design activities, whereas Asdar et al. (2024) reported positive associations in a cross-sectional study and Min and Seo (2024) found that frequent at-home device use was generally associated with lower reading achievement, with differences across student subgroups. The corpus therefore does not support the conclusion that device access or use alone improves reading literacy. Future studies should specify the instructional purpose, intensity, and context of digital use and evaluate these features with designs capable of supporting causal inference.

Implications for Indonesia and comparable contexts. Five included studies were conducted in Indonesia (Asdar et al., 2024; Dewani et al., 2024; Iswara et al., 2026; Melindawati et al., 2026; Nurmahanani, 2023), making Indonesia the most represented single-country context in the corpus. Discussions of PISA results have long foregrounded concern about reading performance in Indonesia (Hewi & Shaleh, 2020), but the Indonesian studies in this review address a wider set of issues, including reading interest, ICT-supported learning, integrated foundational literacy, school-wide literacy culture, and multicomponent instruction. This diversity indicates a multi-level research agenda; because the studies use different designs and outcomes, however, the corpus does not establish the universal superiority of any single integrated approach.

Limitations of the review. Several limitations constrain interpretation. First, the search used Scopus only, English-language peer-reviewed journal articles, and full-text availability, so relevant evidence outside those boundaries may be absent. Second, the deliberately narrow “reading literacy” search phrase favored construct specificity over sensitivity and may have missed studies using related labels such as reading comprehension or reading achievement. Third, no formal risk-of-bias or methodological-quality appraisal was applied across the heterogeneous study designs. Fourth, the synthesis relied on thematic mapping and descriptive frequencies rather than effect-size estimation; therefore, the review cannot rank interventions or establish comparative effectiveness. These limitations mean that the conclusions should be interpreted as a map of the retrieved evidence rather than as a complete or quality-weighted estimate of the global literature.

5. Conclusion

This systematic review mapped 29 Scopus-indexed studies on reading literacy in primary education published between 2021 and 2026 and synthesized them using the PIRLS context model. The findings address three descriptive questions concerning research characteristics, contextual factors, and evaluated instructional approaches.

First, the corpus was concentrated in 2024 (11 studies; 37.9%) and was heterogeneous in both design and geography. Experimental and quasi-experimental studies formed the largest single design category, followed by secondary large-scale analyses and quantitative observational studies. Indonesia and South Africa were the most represented single-country contexts. Given the review’s search boundaries, these patterns should be interpreted as characteristics of the retrieved corpus rather than as a complete census of global reading-literacy research.

Second, reported factors were distributed across all four PIRLS contextual levels: student, home, school/classroom, and national/community. Student and

school/classroom factors received the greatest direct attention, while home and national/community factors were less frequently examined as intervention targets. Much of the evidence at these levels is associative rather than causal. The cross-level pattern therefore supports the need for research designs that can examine how contextual influences interact rather than if classroom instruction alone explains reading outcomes.

Third, intervention-oriented studies frequently incorporated structured engagement with text, foundational skill development, comprehension or strategy instruction, motivational support, digital or gamified activities, and multi-stakeholder components. However, because this review did not conduct a formal quality appraisal or meta-analysis, it cannot determine which intervention is superior or estimate comparative effectiveness. Digital findings were particularly mixed, reinforcing the need to distinguish purposeful instructional applications from general device use.

The practical implications should therefore be treated as evidence-informed options rather than universal prescriptions. Curriculum designers and school leaders can use the mapped components to identify approaches that warrant local evaluation, while policymakers should consider how home, school, and system conditions shape the implementation of literacy programs. Future primary studies would benefit from stronger longitudinal and experimental designs in underrepresented contexts, direct evaluation of home-literacy interventions, and clearer reporting of contextual moderators. Future reviews should broaden database coverage and search terminology, use independent duplicate screening and data-extraction procedures where feasible, apply design-appropriate quality appraisal, and, when outcomes are sufficiently comparable, estimate effect sizes rather than relying solely on narrative synthesis.

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