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The Effectiveness of Supplementary Reading Materials in Improving Students' Reading Comprehension: A Systematic Literature Review

Mustika[1], Ashadi[2], Joko Priyana[3]
[1,2,3]Universitas Negeri Yogyakarta, Yogyakarta
Corresponding E-Mail: mustika32fbsb.2023@student.uny.ac.id

Abstract

This systematic literature review examined thirteen articles published between 2020 and 2024 in various countries, including Malaysia, China, Indonesia, the Philippines, and Cambodia, that addressed the broad issue of improving students' reading comprehension at various levels of education through supplementary reading materials. The purpose of this study was to assess the efficacy of these reading materials, determine the most beneficial types, and examine the variables influencing their success using the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guidelines. The results indicated that supplementary reading materials can improve students' post-test reading scores (mean score increased by 21.34%), motivation, engagement, vocabulary acquisition, language comprehension, and critical thinking skills. Older students responded better to text-based reading materials, while younger students benefited more from digital resources. A key factor influencing the impact of reading materials is their relevance to students' cultural and personal backgrounds. Future research is recommended to examine how supplementary teaching materials can be used in online and hybrid learning to improve learning outcomes in the digital age.

Keywords: *Reading; Reading Comprehension; Supplementary Reading Materials*

Introduction

Reading skills are one of the skills that must be mastered in language learning. Reading affects students' success in the process of acquiring English and students' learning outcomes (Friantary et al., 2020). Reading skills help learners to understand written or printed materials in their language engagement and interaction (Mohammad & Hasbi, 2021). Reading comprehension is a critical competency that must be developed in reading skills. Reading comprehension is crucial because it can train students to achieve reading goals (Anwar et al., 2020). Reading comprehension is the ability to master the meaning of words and sentence structure, conclude, and find answers to questions based on reading content (Gotmare & Potaye,2022).

Many students in some Asian countries still struggle to achieve higher reading comprehension levels in various educational contexts. Based on the results of the 2022 PISA assessment, only 25% of students in Indonesia achieved the minimum reading proficiency level (Level 2), and 74% were far below the OECD average (OECD, 2023). This is also true in the Philippines, where only 24% of students achieved Level 2 or higher in reading (OECD, 2023). At the school level, students' reading comprehension is still a problem, caused by several factors, such as challenges with low motivation, complex vocabulary, long sentences, paragraphs, main ideas, English language structures and influences from their home and school environments (Annisa et al., 2023; Asmarni et al., 2022; Balqis, 2022).

Despite many challenges, various previous studies have shown that supplementary reading materials can significantly improve students' reading comprehension. These materials are additional resources tailored to accommodate diverse student conditions and needs, thereby enhancing the learning experience and supporting the development of effective reading skills (Cahyaningrum et al., 2016). For example, Asdiwarman and Mustofa (2023) proved that using Bima folklore as teaching materials can significantly improve high school students' reading comprehension, as shown by the experimental group's outperformance of the control group in post-test scores. Another study by Azor and Gutierrez (2023) also proved that the use of additional reading materials can significantly improve the reading comprehension of the experimental group, which initially had an average pre-test score of 4.00 at the frustration level, then increased to 6.49, reaching the instructional level after implementation. Franchisca (2021) has found that short stories in Basic Reading classes make learning more exciting and enjoyable, significantly increasing students' vocabulary and reading comprehension.

Although many studies agree that supplementary reading materials can improve students' reading comprehension skills, no systematic review has synthesized the effectiveness of these materials across different educational contexts. This gap in the literature needs to be filled to provide evidence-based guidance for educators and policymakers in designing more effective reading strategies.

The purpose of this systematic literature review is to evaluate the effectiveness of supplementary reading materials in improving students' reading comprehension at different levels of education. The types of supplementary reading materials used, the educational contexts in which they are implemented and the factors that influence their effectiveness are examined. This study addresses three main questions: (1) How effective are supplementary reading materials in improving reading comprehension at different levels of education? (2) What types of supplementary reading materials are most effective at different levels of education? (3) What factors influence the success of these reading materials? These questions guided this review in synthesizing findings from studies published between 2020 and 2024 to provide evidence-based insights and best practices for optimizing the use of supplementary reading materials at different levels of education.

Method

A systematic literature review approach was used in this study to identify, assess, and synthesize findings from existing research on the use of supplementary reading materials to improve students' reading comprehension. Data analysis was conducted qualitatively and quantitatively to integrate relevant research findings. To ensure a transparent and systematic literature review process, the PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-Analyses) guidelines were used. An important tool used to guide researchers in conducting a systematic review so that the review process is comprehensive and transparent is the PRISMA flowchart and checklist (Arvanitis, 2024).

The PRISMA flowchart and checklist guided the formulation of research questions, search methods, inclusion and exclusion criteria, study selection, data extraction, and synthesis methods (Yepes-Nuñez et al., 2021). It also provided a comprehensive overview of existing research on the use of supplementary reading materials to improve students' reading comprehension and identified gaps for future research.

The literature sources were taken from the Scopus and Google Scholar databases. Scopus was chosen because it provides high-quality academic literature with high validity and credibility. Google Scholar was chosen because of its broad coverage. In addition, the SciSpace was used as platforms to help navigate and filter articles relevant to 'the effectiveness of supplementary reading materials in improving students' reading comprehension.'

The search strategy involved the use of Boolean operators to combine relevant keywords. The search string "Supplementary reading materials" was used in the Scopus database and the Scispace platform to find articles focused on this specific topic. Meanwhile, more specific search strategies were applied in the Google Scholar database, such as "Supplementary Reading Materials" AND "Reading Comprehension" and "Supplementary Reading Materials" AND "Effectiveness" AND "Reading Comprehension." These search strategies were designed to find a broad yet targeted collection of relevant articles. The literature search was conducted between October and December 2024. The process resulted in an initial search of 1098 relevant articles, and an initial screening was performed to remove duplicates and irrelevant articles based on title and abstract.

Following the PRISMA guidelines, initial identification was performed on 1,098 articles through a database search. The first filter was applied for publication date (the last five years), resulting in no articles being eliminated. Next, title and abstract screening resulted in the exclusion of 256 articles because they were books, book chapters, proceedings, theses, or dissertations, which did not meet the document type requirements, leaving 842 articles. Further examination was conducted for inadequate citations or lack of academic influence. Of the 842 articles, 413 were excluded, leaving 429. A total of 412 articles were excluded because their content was irrelevant to the topic and 4 additional articles were removed for

including variables inconsistent with the focus of this review, resulting 13 articles for eligibility assessment.
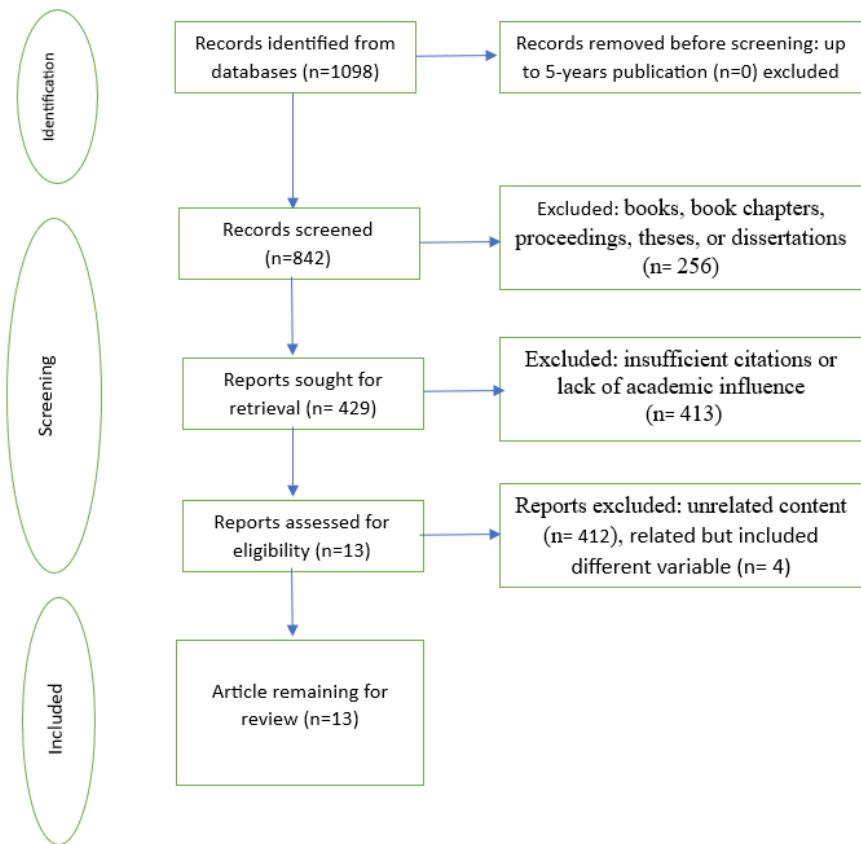

Figure 1. The Visualization of Searching, and Electing Process

Table 1. Criteria of Eligibility

Criteria for Inclusion	Criteria for Exclusion
1. Articles published within the last five years (2020-2024).	1. Publications older than five years (before 2020).
2. Publications that are peer-reviewed journal articles.	2. Non-journal publications such as books, proceedings, theses, or dissertations.
3. Studies that have a sufficient academic impact (with adequate citations).	3. Studies with insufficient citations or lacking academic influence.
4. Studies focusing on using supplementary reading materials aimed at improving students' reading comprehension.	4. Studies should have focused on using supplementary reading materials to improve reading comprehension.

The screening citation threshold was based on the year of publication to maintain the academic quality of the selected articles. Articles published between 2020 and 2022 were considered to have had more time to accumulate scientific influence. Therefore, the citation threshold for 2020 was required to be at least 5

citations, 2021 to be at least 4 citations, and 2022 to be at least 3 citations. Meanwhile, for articles published in 2023 and 2024, no citation threshold applied, as they were too recent to accumulate significant citations.

The data analysis process was carried out based on predetermined eligibility criteria. The selection process was carried out in several stages to ensure that only relevant articles were included. The first stage was initial screening. This stage identified and screened relevant articles based on the title and abstract. The second stage was secondary screening. This second stage involved thoroughly evaluating the article text to ensure eligibility according to the inclusion and exclusion criteria. Articles that passed this stage were then analyzed to identify key themes related to using supplementary reading materials to improve students' reading comprehension.

During the screening process, two reviewers (the principal investigator and a peer reviewer) screened titles, abstracts, and full texts to ensure inter-rater reliability. The two reviewers discussed any discrepancies in inclusion decisions. When consensus was not reached, a supervisor contributed to the final decision. This procedure made the selection process more objective.

An assessment of the methodological rigor of these articles was also conducted to maintain quality. Each article was assessed for clarity of research objectives, appropriateness of research design, sample relevance, instrument validity and reliability, transparency of data analysis, and alignment between findings and conclusions. These assessment criteria ensured that the articles reviewed are methodologically sound.

Next, data from the selected articles were systematically extracted using a standard data extraction form in Microsoft Excel. This extraction process identified educational settings, participant details, types of supplementary reading materials, reading comprehension improvement, and critical factors for effectiveness.

This review had several limitations. First, the search was limited to studies published only in peer-reviewed journals, which excluded other relevant studies in the gray literature, such as these, reports, and conference papers. Second, the search was limited to only the most recent studies, namely those published between 2020 and 2024, ignoring relevant older studies. Furthermore, a further limitation is that the screening process was conducted manually without the use of software. This manual process was subject to human error or bias and was less efficient, which can lead to the exclusion of relevant studies.

Thematic analysis was used to synthesize qualitative findings. First, all reviewed articles were read repeatedly to be familiar with the data. Next, open coding was conducted to identify findings related to the use of supplementary reading materials. These initial codes were then grouped into broader categories that established patterns and relationships across the articles. This selective coding served as a filter in forming overarching themes that represent the main findings of the reviewed articles.

The analysis was also complemented by quantitative results, which allowed for the assessment of the effectiveness of supplementary reading materials through measures such as reading comprehension scores. The results were then combined to provide a comprehensive and holistic picture of the use of supplementary reading materials and their impact on reading comprehension at different levels of education.

Results

Based on the initial data analysis process, this systematic literature review examined 13 studies that used supplementary reading materials to improve students' reading comprehension. This study aimed to examine the effectiveness of supplementary reading materials in improving students' reading comprehension at various levels of education between 2020 and 2024. Qualitative and quantitative data from these 13 selected studies were then synthesized and compiled to answer research questions including the significant effectiveness of supplementary reading materials in improving students' reading comprehension skills, identifying the most effective types of supplementary reading materials at various levels of education, and examining important factors that influence their success.

The table below is a summary of 13 articles relevant to the effectiveness of supplementary reading materials for improving students' reading comprehension. Key information for each study presented in this table includes educational setting, participant details, type of supplemental reading material, reading comprehension gains, and factors important to effectiveness found in each study.

These studies covered various levels of education, from early childhood to university, in Indonesia, Malaysia, the Philippines, Cambodia, and China. The supplementary reading materials used were diverse, including culturally based reading materials, books, short stories, folktales, internet-based texts, comics, animated videos, digital game packages, and teacher-created resources. Variation was also found in the reading comprehension gains reported across studies, including significant increases in post-test scores, reading comprehension levels, and student engagement. Furthermore, factors such as cultural relevance, teacher engagement, and student engagement with the material contributed to the effectiveness of supplementary reading materials in improving reading comprehension.

Table 2. Summary of educational settings, participant details, types of supplementary reading materials, reading comprehension improvement, and critical factors for effectiveness

No	Author(s) and Year	Educational Settings	Participant Details	Types of Supplementary Reading Materials	Reading Comprehension Improvement	Critical Factors for Effectiveness
1	Nambiar et	Secondary	- 227 students	Local Culture-Based Reading	Implementing local culture-based	- The integration of

	al., 2020	schools	from Forms 1, 2, and 3 across 13 schools. - 30 teachers representing 20 schools in Terengganu.	Materials.	reading materials significantly improved students' reading comprehension skills by reducing challenges with unfamiliar vocabulary and topics, enhancing text understanding, improving retention, and enabling students to apply new vocabulary in context effectively.	local culture into language materials. - Familiarity with cultural elements. - The use of varied teaching materials. - Active participation in class discussions, driven by relatable content. - Continuous feedback from teachers and students.
2	Qing and Xiao, 2020	Chinese Extensive Reading (ER) classes	- 74 students majoring in English.	Articles that allow students to connect personal experiences and social issue.	The study shows that supplementary materials significantly enhance critical reading abilities in extensive reading classes, improving students' engagement, understanding of complex topics, and alignment with educational goals to foster reading comprehension and critical thinking.	- The reading materials are comprehensible. - The integration of social justice themes within the materials. - The willingness of students to express their ideas in writing and relate personal experiences to the reading content.
3	Franc hisca, 2021	Basic Reading class of the English Language Education Study Program at Univers	- Two classes of first-semester students enrolled in the English Language Education Study Program at Universitas Ekasakti	Short stories.	Short stories significantly improved students' reading comprehension in the Basic Reading class. The student's average score increased from 70.05 in the first meeting to 85.75 in the last meeting. They not only	- The right choice of the short story is motivating, enjoyable, and appropriate to the student's ability level. - The stories are challenging enough without being too complicated and

	ity.	Padang.		enrich vocabulary but also promote students' critical thinking and moral understanding.	are aligned with students' linguistic, intellectual, and emotional capacities. - Interaction between students and texts. - The teaching methodology, including pre-activities and post-activities.
4	Manla paz et al., 2022	Junior High School	415 Grade 7 students from all sections of San Luis National High School	Contextualize d-Based Learning Materials.	Grade 7 students' reading comprehension improved significantly, with scores increasing from 42.41% to 77.35% after using contextual learning materials, which effectively addressed problems in word recognition, pronunciation, and text comprehension.	- Materials based on everyday life and local culture. - Encouraging interactive learning. - Builds student confidence through relevant and positive reading experiences. - Teachers provide guidance and challenges to enhance student understanding.
5	Alcala and Tamba n, 2022	Elemen tary School	72 Grade Three pupils from Sampiruha n Elementar y School in the School Division of Calamba City, Laguna, during the school year 2020-	Animated Video Presentation (AVP).	This study shows that Animated Video Presentations (AVP) significantly improved reading comprehension among Grade 3 students compared to traditional printed materials. This is indicated by the difference in mean scores of 82.87 (experimental group) and 63.80	- The integration of technology in reading materials. - The combination of moving images, audio, and text in AVP. - Proper guidance and a variety of interesting reading materials. - interactive

					2021	(comparison group).	nature of AVP.
6	Crawford et a., 2023	Young readers	504 households (an equal number of boys and girls) in low-resource environments in Cambodia's Banan, Kampong Svay, and Santuk districts.	Storybooks.	This study showed significant improvements in reading comprehension among young Cambodian students who participated in a Home-Based Reading (HBR) intervention. This was demonstrated by children enjoying reading more after the intervention. Treatment groups 2 and 3 obtained significantly higher reading comprehension scores than the control and treatment groups one at the final assessment.	- Active engagement of caregivers. - High-quality, age-appropriate reading materials accompanied by a reading support network. - The Social Cognitive Theory (SCT) framework emphasizes the interaction of personal, environmental, and behavioral factors. - Consistent encouragement through communication and support from caregivers and educators.
7	Novitasari, 2023	Junior high school	Students from class 7A at SMP Wahidiyah, consisting of a total of 41 students.	Internet-Based Texts.	This study showed a significant improvement in students' reading comprehension after being taught using internet-based text materials. The students' mean score increased from 68.41 in the pre-test to 93.4 in the post-test, indicating a substantial improvement in their ability to scan and skim information.	- The variety and relevance of the texts. - Learning is flexible, and offline reading allows access to and save texts. - Internet-based materials can address students' boredom and provide fresh content. - The integration of scanning and skimming techniques in reading

					instruction.
8	Azor and Gutierrez, 2023	Senior high school	Sixty (60) Grade 11 GAS students from San Cristobal Integrated High School during the academic year 2020-2021.	Teacher-made reading materials with simplified texts, word meanings in English and Tagalog, and common synonyms.	The supplementary materials effectively improved students' reading skills and comprehension abilities. The experimental group showed an increase in the mean score of literal comprehension from 4.00 (frustration level) to 8.13 (independent level) after the intervention. In addition, the inferential and evaluative comprehension scores also increased, moving from the frustration level to the instructional level, with mean scores of 6.50 and 4.83, respectively.	- The materials are engaging and relevant to the students. - Teachers' good ability to provide technical assistance in constructing and reproducing these materials. - Family issues and work commitments.
9	Mondragon et al., 2023	Early childhood education	30 kindergarten learners from Shuttle Elementary School, located in South Fatima District, Barangay San Jose, General Santos City, during the school year 2021-2022.	Digital Play-Based Supplementary Learning Packages.	This study shows that using Digital Game-Based Supplemental Learning Packages significantly improves the reading skills of kindergarten students. After implementing the digital learning package, post-test scores showed a practical improvement in reading ability. These findings suggest that integrating technology in early childhood	- The active engagement of young learners with the materials. - Well-designed supplementary materials that align with educational goals and competencies. - The integration of technology.

					education can foster creativity and engagement, which ultimately leads to better learning outcomes in reading comprehension.	
10	Tañala, 2023	Elementary school	Grade 6 pupils in Sampiruhan Elementary School.	Comic-based reading materials	The study demonstrated that implementing Comic-Based Reading Materials significantly improved the reading comprehension of Grade 6 pupils. The experimental group, which utilized these materials, showed better performance in their posttest scores than their pretest scores.	- Supplementary materials are designed and adapted from existing educational resources and align with local educational contexts. - The materials are designed using a combination of visuals, simplified text, and narrative style. - The materials provide an approachable format for struggling readers with straightforward content.
11	Firmallah and Mustofa, 2023	Senior high school	Tenth grade students from the IPA program at SMA Negeri 2, consisting of a total of 62 participants.	Bima folktales	The results of the study showed a significant increase in the learning outcomes of reading comprehension of the experimental group using Bima folklore compared to the control group. The results of the statistical analysis showed a significance value of 0.005, which caused the null hypothesis to be rejected and	- The homogeneity of the students' reading comprehension abilities. - The materials are familiar and based on the student's background knowledge. - The materials reflect students' local culture. - The materials use relevant

					the alternative hypothesis to be accepted.	vocabulary and language structures suitable for students' levels. - Integrating local cultural values into the materials.
12	Repaso and Macalisang, 2024	Elementary school	Twenty-four (24) Grade 1 pupils	Contextualized Marungko Approach-Based Supplementary Reading Material	Improved reading comprehension involves more than simply decoding words; it requires active engagement with the text, making connections, and critically analyzing information to construct meaning.	- Supplementary reading materials that are engaging and age-appropriate and provide additional practice opportunities and reinforce core curriculum concepts. - Teaching letter sounds with structured and sequential development.
13	Hayyu et al., 2024	Early childhood	35 participants, all children aged 5-6 years, from SB Al-Ikhlas Kampung Sungai Penchala, Malaysia.	The Hubbul ilmii book	The study indicates that the Hubbul Ilmii Book significantly enhances reading comprehension among children aged 5-6 with a p-value of 0.000 and a t-value of 8.276. Improvements were observed in reading proficiency, including vocabulary recognition and sentence comprehension.	- Integration of multimedia resources into the curriculum. - The learning environment and parental support. - Teacher can effectively utilize educational tools.

Table 3 presents the distribution of the 13 reviewed studies by participant education level, ranging from Early Childhood Education to university level. This table provides a clear overview of the diversity of student populations studied regarding the use of supplementary reading materials to improve reading

comprehension. The distribution is relatively balanced across educational levels as seen in Figure 2 below, with the majority of studies conducted in Early Childhood Education, Elementary Schools, and Junior High Schools, each accounting for approximately 23% of the studies.

Table 3. Distribution of Studies by Education Level

| No	Author(s) and Year	Educational Level
1	Crawford et a., 2023; Mondragon et al., 2023; Hayyu et al., 2024	Early Childhood Education
2	Alcala and Tamban, 2022; Tañala, 2023; Repaso and Macalisang, 2024	Elementary School
3	Nambiar et al., 2020; Manlapaz et al., 2022; Novitasari, 2023	Junior High School
4	Azor and Gutierrez, 2023; Firmallah and Mustofa, 2023	Senior High School
5	Qing and Xiao, 2020; Franchisca, 2021	University
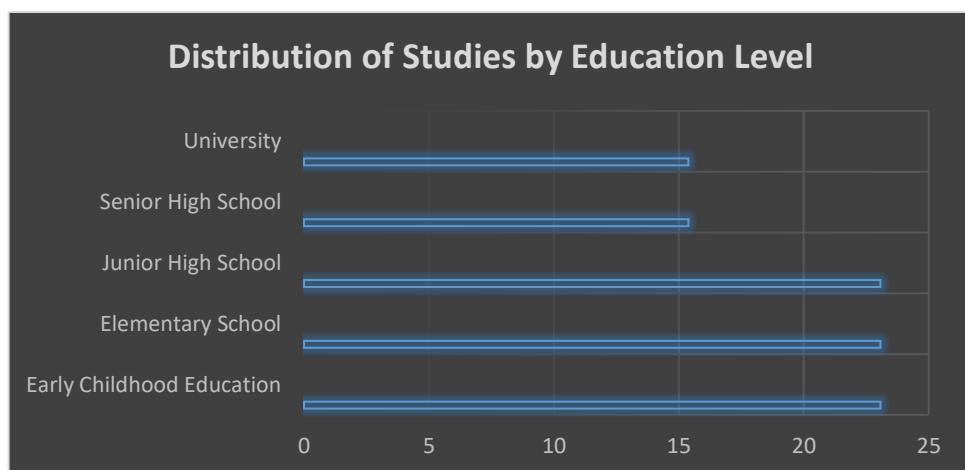
Figure 2. Distribution of Studies by Education Level

Table 4 presents the distribution of the 13 studies based on the type of supplementary reading materials used in each study, categorized into three main types: text-based materials, visual and multimedia materials, and internet-based and digital resources. This table highlights the diversity of materials used in the various studies, ranging from traditional text-based materials to more modern forms of learning aids such as animated videos and internet-based texts. Based on Figure 3, 61% of the total studies used text-based supplementary reading materials. This was followed by visual and multimedia materials at 31%, and only 8% used internet-based and digital resources. This distribution indicates that traditional reading materials were the most widely used in these studies.

Table 4. Distribution of Studies Based on Type of Supplementary Reading Materials

No	Author(s) and Year	Type of Supplementary Reading Materials
1	Azor & Gutierrez, 2023; Crawford et al., 2023; Firmallah & Mustofa, 2023; Franchisca, 2021; Manlapaz et al., 2022; Nambiar et al., 2020; Qing & Xiao, 2020; Repaso & Macalisang, 2024	Text-based materials
2	Alcala & Tamban, 2022; Hayyu et al., 2024; Mondragon et al., 2023; Tanala, 2023	Visual and multimedia materials
3	Novitasari (2023)	Internet-based and digital resources
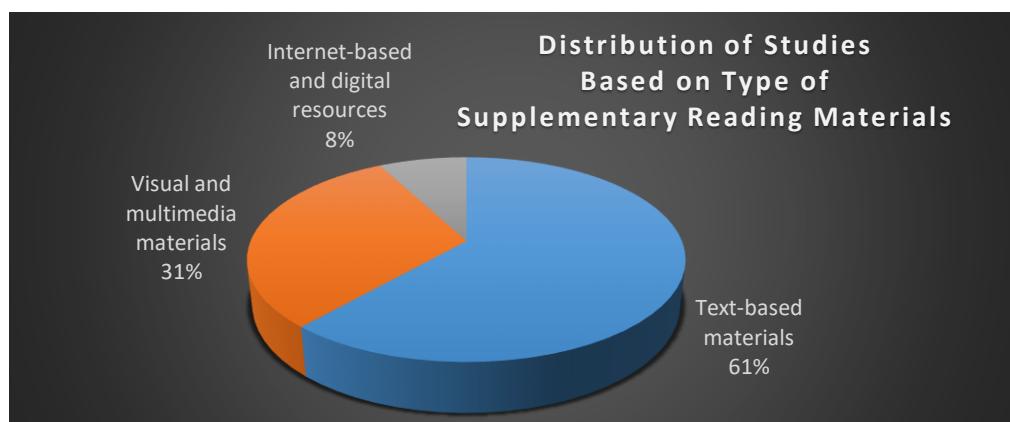
Figure 3. Distribution of Studies Based on Type of Supplementary Reading Materials

Table 5 presents effect sizes for the studies included in this review to assess the magnitude of improvement in students' reading comprehension as a result of using supplemental reading materials. Most studies reported statistical significance, including mean score improvement, Cohen's d, and statistical significance (e.g., p-value or t-value). However, some studies did not provide effect sizes and therefore did not report their results.

Table 5. Effect Sizes in Included Studies

No	Author(s) and Year	Effect sizes
1	Nambiar et al., 2020	Not reported
2	Qing and Xiao, 2020	Not reported
3	Franchisca, 2021	Mean scores improved from 70.05 to 85.75
4	Manlapaz et al., 2022	Pre-test mean score of 42.41% to a post-test mean score of 77.35%
5	Alcala and Tamban, 2022	Cohen's d of 1.02
6	Crawford et a., 2023	Not reported

7	Novitasari, 2023	Mean score increased from 68.41 to 93.4 (pre-test to post-test)
8	Azor and Gutierrez, 2023	An increase in the mean score of literal comprehension from 4.00 (frustration level) to 8.13 (independent level) and mean score of inferential and evaluative comprehension scores, moving from the frustration level to the instructional level, with mean scores of 6.50 and 4.83.
9	Mondragon et al., 2023	Cohen's d for the experimental group is reported as 0.50 and the comparison group is 0.378
10	Tañala, 2023	Cohen's d = 0.862
11	Firmallah and Mustofa, 2023	Sig. (2-tailed) value was .005
12	Repaso and Macalisang, 2024	The t-value calculated was 6.001
13	Hayyu et al., 2024	The t-value of 8.276

Effectiveness of Supplementary Reading Materials on Reading Comprehension

Based on the 13 articles reviewed, the effectiveness of supplementary reading materials in improving students' reading comprehension was evident, showing significant positive impacts across various educational levels. Most studies reported significant improvements in reading comprehension, as evidenced by quantitative evidence, such as an increase in scores on the post-test and a high mean score in treatment group after implementing supplementary reading materials. For example, the Hubbul Ilmii Book as supplementary reading materials demonstrated the most statistically robust improvement with a p-value of 0.000 and a t-value of 8.276 showed a large effect size and statistical significance for the use of the Hubbul Ilmii Book (Hayyu et al., 2024).

These results emphasized that culturally relevant supplementary reading materials were effective in improving reading comprehension in early childhood. Additionally, several studies have also shown that supplementary reading materials were effective in increasing student motivation and engagement. Supplementary reading materials, such as articles, Animated Video Presentations (AVP), comic-based reading materials, and digital play-based supplementary learning packages, could make students more motivated and engaged with interesting, relevant, and interactive materials (Alcala & Tamban, 2022; Mondragon et al., 2023; Qing & Xiao, 2020; Tanala, 2023).

Moreover, students' success in vocabulary enrichment and language comprehension also demonstrated these supplementary materials' effectiveness. Text-based materials like short stories, local culture-based reading materials, Bima folktales, and Hubbul Ilmii books facilitated vocabulary and language structure mastery as a direct result of using supplementary reading materials (Firmallah & Mustofa, 2023; Franchisca, 2021; Hayyu et al., 2024; Nambiar et al., 2020). Some

supplementary reading materials also increased students' critical thinking. Articles and short stories promoted students' critical reading abilities in university context (Franchisca, 2021; Qing & Xiao, 2020; Repaso & Macalisang, 2024). In conclusion, the reviewed studies collectively highlighted the substantial effectiveness of supplementary reading materials in improving students' reading comprehension at various educational levels, with marked improvements in reading scores, motivation and engagement, vocabulary enrichment, and critical thinking skills.

Most Effective Types of Supplementary Reading Materials

Several types of supplementary reading materials effectively improved students' reading comprehension. This depended on the context in which they were used and the needs of the students. Most studies in this review used text-based materials because this type of material was more relevant to students' cultures and lives (Azor & Gutierrez, 2023; Crawford et al., 2023; Firmallah & Mustofa, 2023; Franchisca, 2021; Manlapaz et al., 2022; Nambiar et al., 2020; Qing & Xiao, 2020; Repaso & Macalisang, 2024).

These materials included local culture-based reading materials, articles, short stories, contextual-based teaching materials, storybooks, Bima folktales, teacher-made reading materials and contextualized Marungko approach-based supplementary reading materials. Several studies, such as Crawford et al. (2023), Qing and Xiao (2020) and Nambiar et al. (2020), reported significant improvements in reading comprehension, but did not provide effect sizes. The second most widely used visual and multimedia materials made students more interested and involved because of their attractive appearance (Alcala & Tamban, 2022; Hayyu et al., 2024; Mondragon et al., 2023; Tanala, 2023).

These materials included Animated Video Presentation (AVP), digital played-based learning packages, comic-based reading materials, and the Hubbul Ilmi book. The largest effect size was demonstrated in a study using Animated Video Presentations (AVPs) in Alcala and Tamban (2022)with a Cohen's d value of 1.02, indicating a significant impact on students' reading comprehension. This suggested that AVPs could significantly increase the engagement and comprehension of elementary school students. In addition, internet-based and digital resources, which were flexible and allowed students to learn independently used in one study (Novitasari, 2023). These materials were in the form of internet-based texts which provided a more modern approach to reading instruction.

Factors Influencing the Effectiveness of Supplementary Materials

This systematic literature review found various factors influencing the effectiveness of supplementary reading materials in improving students' reading comprehension. One of the most prominent factors was culturally or contextually relevant supplementary reading materials which successfully helped students understand vocabulary, pronunciation, concepts and encourages critical thinking

(Firmallah & Mustofa, 2023; Franchisca, 2021; Manlapaz et al., 2022; Nambiar et al., 2020; Qing & Xiao, 2020).

Another key factor was supplementary reading materials that used interactive methods, made students easier to understand the text (Alcala & Tamban, 2022; Mondragon et al., 2023; Tanala, 2023). Furthermore, technical assistance from teachers and caregivers support could maximize learning outcomes (Azor & Gutierrez, 2023; Crawford et al., 2023). Finally, the systematic structure and innovative design of supplementary reading materials helped students build a solid reading foundation and enhance their recognition of vocabulary and sentences (Hayyu et al., 2024; Repaso & Macalisang, 2024).

Integrating technology into supplementary reading materials also could encourage student engagement, significantly improving reading skills (Mondragon et al., 2023; Novitasari, 2023). In summary, the effectiveness of supplementary reading materials was primarily influenced by several interconnected factors such as cultural relevance, interactive features, teacher and caregiver engagement, and systematic design. They worked together to engage students, reduce cognitive barriers, and create a learning environment that maximized the impact of supplementary materials across a variety of educational contexts.

Discussion
Interpretation of Key Findings

The findings from the 13 studies reviewed demonstrate that supplementary reading materials generally improved students' reading comprehension across various educational levels. Several factors influence their effectiveness, including learner characteristics, material design, and teaching context. In terms of learner characteristics, for example, for early childhood and elementary levels, effective materials include Hubbul Ilmii books, digital game-based packages, and Marungko-based resources, as they provide structured, multisensory, and sequential learning experiences appropriate for developing readers.

Meanwhile, for older learners (ages 12-18 and above), more impactful materials are culturally grounded text-based materials (short stories, contextual modules, and folktales) because they activate students' prior knowledge and support deeper understanding. These findings are in line with existing educational theories. Krashen's Input Hypothesis emphasizes that input must be culturally relevant and appropriate to the learner's background, so that it can improve learner understanding (Krashen, 1982). While Mayer (2009) with the Cognitive Theory of Multimedia Learning supports materials that use digital devices that integrate visual and auditory to increase engagement and understanding.

In addition to instructional factors, practical considerations also influence the effectiveness of materials such as AVP and digital games, which require technological infrastructure, teacher training, and stable internet access. These materials are certainly not feasible in resource-constrained contexts. Text-based materials (local

folktales and contextual modules) are more suitable for schools with limited budgets, as they are more cost-effective and easily accessible. Implementation was also influenced by the COVID-19 pandemic (2020–2024), which led many students to use digital or take-home materials due to limited classroom access. This situation accelerated the use of multimedia and home-based reading interventions, but widened the gap for students with limited access to technology.

Contradictions Across Studies

While most studies show positive improvements, some studies show inconsistencies, suggesting that the effectiveness of supplementary reading materials is not universal. Some studies report only modest improvements or no significant advantages, such as the findings of Azor and Gutierrez (2023), who indicated that supplementary materials were not always superior because there was no significant difference in post-test scores between the experimental and control groups. This suggests that supplementary reading materials may need to be more closely aligned with students' cognitive readiness and learning needs.

Similarly, Crawford et al. (2023) findings regarding a home-based reading intervention in Cambodia indicate that materials alone yielded only minimal improvements. Support in the form of text message reminders, caregiver involvement, and structured reading support were still needed for significant improvements. This contradiction underscores that supplementary reading materials are not always effective but require appropriate scaffolding, cultural relevance, and implementation support to be effective.

Theoretical Integration

These findings also shed light on how they support, extend or challenge theoretical perspectives. For example, while multimedia theory by Mayer (2009) supports improvements in reading skills among readers aged 5–12, older learners (ages 12-18 and above) often benefit more from text-based materials, suggesting limitations to multimedia's advantages. This indicates that multimodal input is most impactful in early literacy stages rather than for advanced readers.

Furthermore, these findings support schema theory. This is demonstrated by the fact that culturally relevant texts (folktales, culturally based readings, and contextual modules) help students understand texts more deeply because they activate familiar cultural knowledge (Barlett, 1932). This also aligns with Tomlinson's (2011) principles of material development, which emphasize that language materials must be meaningful, contextually relevant, and emotionally engaging. Studies using culturally connected materials have been shown to significantly increase students' emotional and cognitive engagement. This demonstrates the crucial role of Tomlinson's framework in facilitating comprehension.

Similarly, the sociocultural perspective is supported by findings that suggest

that materials alone are not sufficient; family involvement and teacher mediation significantly influence learning outcomes, particularly in reading comprehension.

Finally, the findings also demonstrate an increase in inferential and evaluative skills in middle and high school students, reinforcing Bloom's Taxonomy (Bloom et al., 1956). Students analyzed, evaluated, and synthesized information from materials such as short stories and thematic articles, which align with higher-order cognitive processes. This suggests that appropriately designed supplementary materials can encourage students to engage in deeper critical thinking.

Practical Recommendations
For Teachers
When using supplementary materials, teachers must integrate them with students' developmental stages and cultural backgrounds to ensure relevance and maximize comprehension. Early and elementary students are more likely to benefit from multimedia resources, while middle and high school students will benefit more from text-based, contextual materials. To enhance comprehension, supports such as pre-reading activation, guided questioning, and vocabulary support are essential.

For Curriculum Developers
It is crucial for curriculum developers to prioritize culturally relevant and cost-effective materials to reduce cognitive load and align with learners' linguistic profiles. Furthermore, standard templates for supplementary materials should be developed to help ensure consistency and readability. Multimedia components may be included if digital access is reliable and sustainable.

For Policymakers
To ensure effective implementation, policymakers must allocate funds for teacher training in materials development and technology integration. To address disparities in digital access, schools in low-resource settings need access to culturally relevant print texts. Furthermore, partnerships with local communities are needed to ensure affordable, culturally relevant reading materials.

Limitations
This review is constrained by several limitations. First, publication bias may have occurred, as most articles reported positive results. Second, its limited geographic coverage makes it difficult to generalize globally, as the majority of studies were conducted in Southeast Asia. Third, the instruments used in each study varied and were not standardized to assess reading comprehension, making comparisons difficult. Fourth, most interventions only examined short-term effects and did not explore long-term outcomes. Finally, because this review covered the period 2020–2024, during the COVID-19 pandemic, distance learning and limited classroom interaction, while unequal access to technology may have influenced the impact of the studies.

Future Research Directions

Suggestions for future research include using more rigorous methodology to assess the long-term effects of supplementary materials, using randomized controlled trials, multi-site sampling, and longitudinal designs. Standardized reading comprehension measures should also be used to enhance comparability across studies. Comparing the cost-effectiveness of digital and print materials is needed for further research, especially in resource-limited settings. Given the significant role of caregiver and teacher support observed during COVID-19, future research should explore hybrid and home-based interventions, equity issues in digital access, and the differential impact of pandemic-related learning disruptions. Furthermore, researchers should analyze how supplementary reading materials can support higher-order thinking, critical literacy, and multiliteracies in diverse educational contexts.

Conclusion

This systematic review underscores that supplementary reading materials can significantly improve students' reading comprehension at various levels of education. Most of the effectiveness of these materials is determined by their alignment with the developmental needs and cultural background of the learner. Text-based materials especially local culture-based materials and folklore are more effective for middle-high students because facilitate deeper engagement and comprehension. In contrast, multimedia materials such as animated videos and digital-based games are more effective for early childhood and elementary school students because can meet their multisensory learning needs.

However, another factor determining the success of supplementary materials is the context in which they are implemented. Teacher involvement and caregiver support are needed to integrate these materials. Teachers and caregivers provide guidance and encouragement that significantly contribute to student learning. This review highlights that, while supplementary materials can enhance literacy, effective contextualization must consider cultural factors, developmental stage, and technology access for effectiveness.

Although many studies have shown that supplementary reading materials positively impact reading comprehension, this review identifies several key areas for future research. Research on the application of reading materials in the context of online or hybrid learning is also important to answer new challenges arising from current developments in education. Furthermore, longitudinal studies are needed to assess the long-term impact of supplementary materials on students' overall academic progress and language development.

In conclusion, this review underscores the vital role of carefully designed, culturally and developmentally appropriate supplementary reading materials in enhancing reading comprehension. Educators and policymakers can create more inclusive and effective learning experiences by integrating technological advances,

promoting teacher training, and ensuring active family engagement. Future research should incorporate innovative designs and address the unique needs of diverse learners to promote long-term educational success and maximize the potential of these materials.

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