GLOBAL TRENDS AND FUTURE PROSPECT OF DEVELOPMENTAL READING FROM 2019-2024: BIBLIOMETRIC ANALYSIS

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Abstract: The purpose of this research is to present a comprehensive analysis of the literature on developmental reading. The Google Scopus database and Publish or Perish tools were utilized to identify relevant articles. A total of 111 articles, spanning from 2019 to 2024, were reviewed. The references were organized and summarized using Mendeley software. Using the VOSviewer program, the authors analyzed this database and categorized the articles into five groups. Cluster 1 consists of seven items (developmental study, developmental trajectory, difference, fluency, relationship), Cluster 2 includes five items (developmental perspective, developmental trajectory, difference, fluency, relationship), Cluster 3 comprises four items (Chinese child, dyslexia, training, word), Cluster 4 contains three items (adult, developmental disability, intellectual), and Cluster 5 encompasses three items (developmental relation, evidence, reading comprehension).
Keywords: *bibliometric analysis; developmental reading; publish or perish; VOSviewer Scopus.*

INTRODUCTION

Reading is a cognitive process that stimulates the mind and broadens an individual's knowledge base, allowing them to process information effectively (Paola et al., 2023). This cognitive engagement involves the application of reasoning to interpret, evaluate, and comprehend textual information (Ruslan et al., 2024). In the context of elementary education, reading is a fundamental skill that significantly influences the definition of "success" for pupils, and its importance extends into various aspects of their lives as they mature (Mastrothanasis et al., 2023). As a fundamental component in education, reading serves an important role in establishing students' intellectual foundations, preparing them to face the challenges of future learning and life experiences (Gustian et al., 2024). Reading is also defined an essential skill in language instruction due to its critical role in linguistic communication and the development

of linguistic literacy (Vaughn et al., 2020). The acquisition of reading skills is a gradual process that necessitates ongoing development, underscoring the need for effective support systems for children experiencing reading difficulties (Schoenbach et al., 2023). One of the strategies to improve reading skills is developmental reading (Liman Kaban & Karadeniz, 2021). Its approach emphasizes the importance of structured and individualized interventions that meet the needs of students to ensure long-term reading success (Jamshidifarsani et al., 2019).

Developmental reading focuses on the enhancement of reading abilities, aiming to improve comprehension, fluency, and vocabulary (Tusmagambet, 2020). This developmental process encompasses the progressive refinement of an individual's reading skills over their lifespan, including foundational reading proficiencies, fluency assessment, comprehension strategies, and vocabulary expansion (Aghajani & Gholamrezapour, 2019). As individuals develop these skills out over time, developmental reading supports the development of effective reading habits necessary for academic and personal success (Jabbar & Warraich, 2023). Sabatini et al., (2023) state that one of the key aspects of this approach is its adaptability, serving readers of all ages and promoting the development of literacy lifelong. The differential development of reading subskills such as accuracy, fluency, and comprehension between boys and girls remains an area of ongoing investigation (Manu et al., 2023). 2025/2/25 argue that understanding these gender-based differences can inform a more personalized approach to reading instruction, helping educators to address specific needs and encourage equal opportunities for success. The cultivation of reading fluency, efficiency, and comprehension capabilities requires extensive practice over many years (Karipidis et al., 2021). This long-term commitment is critical for readers to develop the skills necessary for effective information processing and critical thinking, which reinforces the importance of sustainable reading practices in academic and daily contexts (Darling-Hammond et al., 2020).

A substantial body of research has been dedicated to exploring various aspects of developmental reading (Uri & Coiro, 2020). Notable studies include the examination of developmental relations between home literacy environments, reading interest, and reading skills (Georgiou et al., 2021), the interplay between reading and mathematics development in elementary school (Erbeli et al., 2021), and the relationship between listening and reading comprehension in young language learners (Wong, 2021). Other significant investigations have focused on the role of phonemic awareness and executive functions in reading developmental dyslexia (Medina & Guimarães, 2019), the developmental relationship between declarative metacognitive knowledge and reading comprehension during secondary education (Edossa et al., 2019), and the developmental trajectories of white matter structure in children with and without reading impairments (Lebel et al., 2019). Further research has explored the developmental trajectory of intrinsic reading motivation (Miyamoto et al., 2020), the dynamics of students' reading self-concept and reading competence (Sewasew & Koester, 2019), strategies for teaching reading to students with intellectual and developmental disabilities (Lindström & Lemons, 2021), and the stability and developmental interplay of word reading and spelling (Furnes et al., 2023). In this study is focused on bibliometric analysis.

Bibliometric analysis is an objective assessment of scientific research that quantitatively illustrates development trends (Chain & Castro, 2019), research hotspots, and key research institutions within relevant scientific activities (Wang & Tian, 2021). This method aids researchers in comprehending their ideas and serves as a resource for collaborative research endeavors (Zamiri & Esmaeili, 2024). Bibliometric analysis quantitatively measures the productivity of scientific outputs (Dervis, 2019). As Donthu et al., (2021) state that this comprehensive approach makes bibliometric analysis an invaluable resource for understanding the progress and scope of scientific literature. The bibliometric analysis of developmental reading has been extensively discussed in numerous articles to identify and analyze large volumes of scientific literature (Huang et al., 2020). This analysis enables researchers to elucidate the evolutionary nuances of a particular field, explore the intellectual structure of a specific domain within the vast literature, and uncover emerging trends (Foroudi et al., 2021). This enables a clearer understanding of how developmental reading has progressed over time and where future research might be focused, offering valuable insights for educators, policymakers, and academics invested in improving reading proficiency and literacy development (Didion et al., 2020).

Moreover, bibliometric analysis enables the identification of influential works and key contributors within the field, providing insights into the scholarly networks and collaborations that drive advancements in developmental reading (Skute et al., 2019). By examining citation patterns, researchers can trace the evolution of pivotal theories and methodologies, fostering a deeper understanding of how contemporary practices have been shaped by earlier scholarship (Argyres et al., 2020). This historical prospects not only domain preforce but dyniling special studies and specific searchers on training their current landscape (Wang et al., 2024). Moreover, this comprehensive perspective facilitates the recognition of gaps where future research can make meaningful contributions, particularly in addressing the needs of marginalized or underserved populations (Jagtap, 2019). Stevens et al., (2019) argue that by identifying areas that have received limited attention, researchers can focus on developing new strategies and interventions to support these groups. This comprehensive approach ensures that the field of developmental reading continues to evolve, addressing emerging challenges and fostering inclusive educational practices that benefit all learners (Wang et al., 2024).

Additionally, Klarin, (2024) argue that bibliometric methods incorporate advanced visualization tools such as VOSviewer, which allow for the creation of detailed maps of co-authorship, keyword co-occurrence, and thematic clusters. These visualizations provide an intuitive representation of complex data, making it easier to discern connections between various research topics and trends (Qin et al., 2020). Such tools not only enhance the clarity of bibliometric findings but also empower educators, policymakers, and researchers to develop targeted interventions and collaborative frameworks that align with both current demands and future priorities (Ayanwale et al., 2024).

Numerous trend studies have utilized bibliometric analysis in the context of developmental reading (Guo, 2022). Examples include a bibliometric analysis to inform reading lists for physical educators (Wyant et al., 2022), a bibliometric analysis of reading (Ismail, 2021), studies involve reading research on older adults within architecture through bibliometric analysis (Midilli Sarı & Eyüboğlu, 2023), an analysis of citation trends to identify significant articles on delirium using the DDPP model with temporal heatmaps (THM) (Ho et al., 2023), a bibliometric visual analysis of the research history, hotspots, and developmental trends of polymers (Chen et al., 2023), a bibliometric evaluation and hotspot analysis of developmental dysplasia of the hip (Fan et al., 2020), and a bibliometric analysis of cognitive function in developmental coordination disorders (Ji et al., 2022). This article focuses on a meta-analysis of developmental reading.

METHOD

This study employed quantitative research techniques on journal articles, with a particular emphasis on bibliometric analysis. The researchers implemented the five-step bibliometric analysis framework as outlined by (Fahimnia et al., 2015) which includes defining search keywords, initial search results, refinement of search results, compiling initial data statistics, and data analysis.

Defining search keywords. In January 2024, a literature search was conducted using the keyword "developmental reading." Google Scopus was utilized in conjunction with the "Publish or Perish" software to collect the data. The researchers began by entering the term "developmental reading" into the Publish or Perish software, categorizing by 'journal', 'title word', and years '0-0'. From the Google Scopus database, the researchers retrieved 200 articles in the initial search, covering the period from 1963 to 2024 (61 years).

Initial search results. At this stage, the researchers did not restrict the range of years. The oldest article on developmental reading identified was published in 1963. The top twenty articles were identified using the Publish or Perish software.

Refinement of the search results. To refine the search results, the authors controlled the range of publication years, focusing on the period from 2019 to 2024. Additionally, they set specific publication names (journals) as criteria. This refinement process resulted in 111 articles meeting the requirements for the five-year period. A comparison of the results between the original search and the refined search is presented in Table 2.

Table 2. *Comparison metrics*

Metric	Initial Search	Refined Search (2019-2024)
Total Articles	200	111
Total Citations	19,056	799
h-index	76	16
g-index	130	22

Average Citations/Year	312.39	159.80

Compiling the initial data statistics

Following refinement, the result was downloaded and saved in the Mendeley program to the RIS format, which included the title, author's names, abstract, keywords, and journal specification (publishing journal, year of publication, issue, and pages) among other important details about the work. After that, data were evaluated to categorize the publisher, the year publication pattern, and the source of publication.

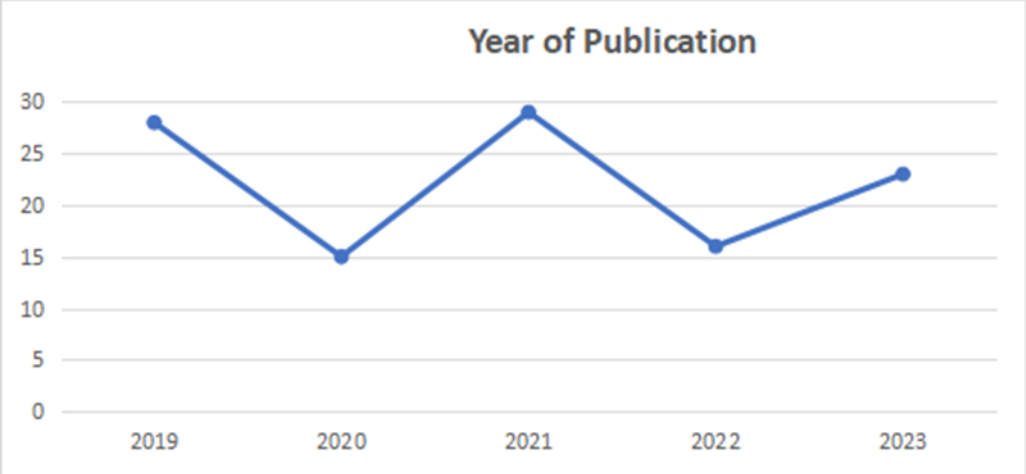

Figure 1. *Year-over-year publication trend*

This figure illustrates the year-over-year distribution of publications on developmental reading. The highest number of articles was published in 2021 (29 articles), followed by notable outputs in 2019 (28 articles) and 2023 (23 articles). The data underscores a fluctuating but sustained interest in the topic.

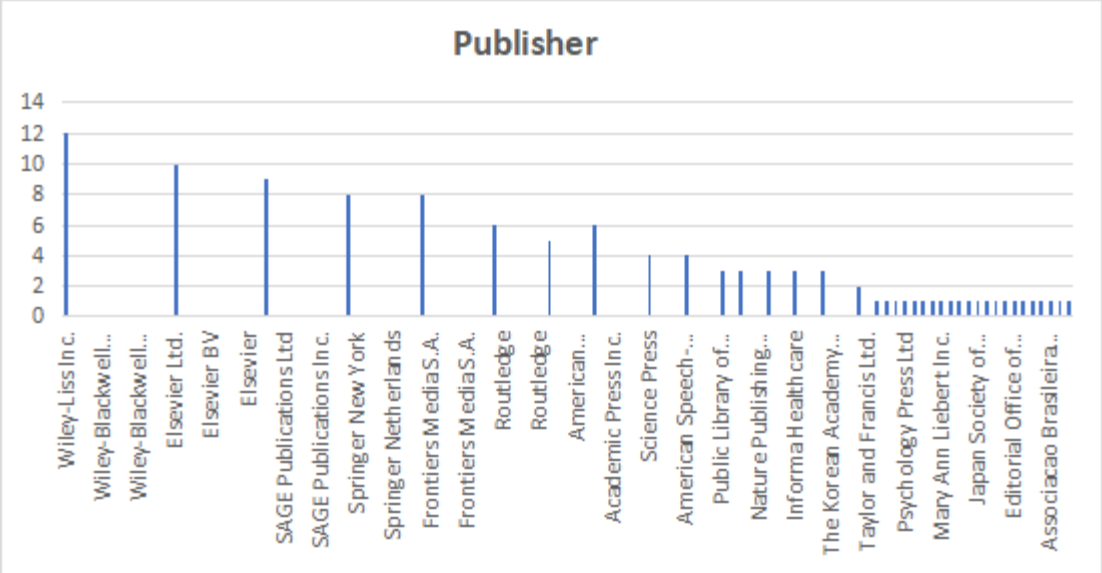

Figure 2. *Publisher of cited articles*

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Note: The Publisher cited on developmental reading there were 38 publisher such as Wiley-Blackwell Publishing Ltd was 12 articles, Elsevier was 10 articles, Frontiers Media S.A. was 8 articles, Sage Publication was 9 articles, Springer was 8 articles, Routledge was 6 articles, Academic Press Inc was 6 articles, American Psychological Association was 5 articles, American Speech-Language- Hearing Association (ASHA) was 4 articles, Nature Publishing Group was 3 articles, The Korean Academy of Speech- Language Pathology and Audiology (KASA) was 3 articles, Public Library of Science was 3 articles, Taylor and Francis Ltd was 2 articles, Informa Healthcare was 3 articles, Multidisciplinary Digital Publishing Institute was 3 articles, and one article each in another publisher). This figure highlights the primary publishers in the field. Wiley-Blackwell

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https://journal.uniku.ac.id/index.php/ERJEE

leads with 12 articles, followed by Elsevier (10 articles) and Frontiers Media S.A. (8 articles). These publishers represent significant contributors to advancing research on developmental reading.

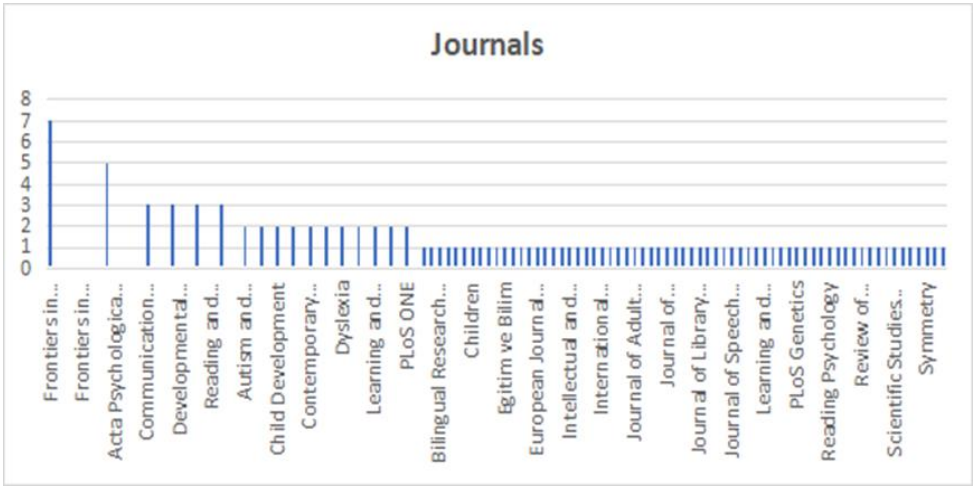

Figure 3. *Journal where analysis pieces were published*

Journals only contain data from publications that have been published on the theme of "developmental reading". Frontiers of Psychology are 7 articles, Acta Psychologica Sinica are 5 articles, Communication Sciences and Disorders are 3 articles, Developmental Psychology are 3 articles, Reading and Writing are 3 articles, Scientific Reports are 3 articles, Autism and Developmental Language Impairments are 2 articles, Brain Sciences are 2 articles, Child of Developmental are 2 articles, Community Collage Journal of Research and Practice are 2 articles, Contemporary Educational Psychology are 2 articles, Developmental Sciences are 2 articles, Dyslexia are 2 articles, Language, Speech and Hearing services in School are 2 articles, Learning and Individual Differences are 2 articles, Neurolmage are 2 articles, PLoS ONE are 2 articles, and there is an article in other journals such as Journal of Educational Psychology, Journal of the American Academy, Journal of Communication Disorder, Journal of Child Psychology and Psychiatry and Allied Disciplines, Journal of Experimental Child Psychology, International Journal of Psychophysiology, International Journal of Speech- Language Pathology, Journal of psycholinguistic Research, Journal of Collage Reading and Learning, International Journal Developmental Disabilities, Journal of Special Education Technology, International Journal of Disability Development and Education, Journal of Library Science in China, Journal of Policy and Practice in Intellectual Disabilities, Journal of Learning Disabilities, International Journal for Research in Learning Disabilities, Journal of Developmental and Behavioral Pediatrics, Journal of Adult and Continuing Education, Japan Journal of Logopedics and Phoniatrics. In total 82 journals discussed issues related to developmental reading.

This paper presents a bibliometric study of the term "developmental reading" using data from the Google Scopus database. The study employed the Publish or Perish software, version 8.9.4554.8721, to conduct a bibliometric review. Initially, 200 papers were identified. After refining the search, 111 papers remained. The citation rate fluctuated between 312.39 and 159.80 citations per year.

RESULTS AND DISCUSSION

This study, citation metrics are significantly impacted by papers published in journal that are indexed by Scopus. According to Table 3, show that the most cited article on developmental reading is the article written by M.J.Snowling propose a title "Dyslexia and Developmental Language Disorder: comorbid disorders with distinct eff ects on reading comprehension. The article was written in 2020, published in the Journal of Child Psychology and Psychiatry and Allied Disciplines and cited by 67 authors. The second most-cited article written by S. Ebert entitle "Theory of mind, language, and reading: Developmental relations from early childhood to early adolescence. The article was written in 2020, published in the Journal of Experimental Child Psychology and cited by 42 authors. The third most-cited article written by H.L. Storkel entitle" The impact of dose and dose frequency on word learning by kindergarten children with developmental language disorder during interactive book reading" the article is written in

2019, published in the journal Language, Speech, and Hearing Services in Schools and cited by 34 authors.

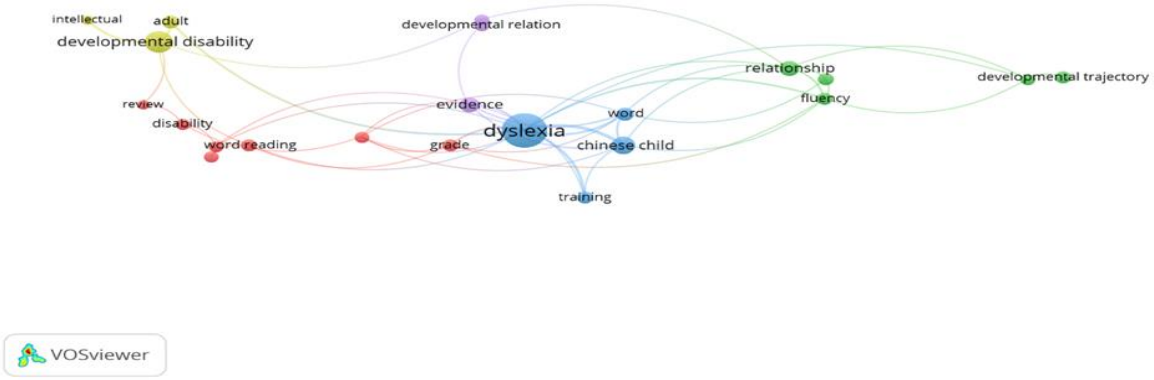

Figure 4. *Network visualization mapping*

(Note: There are five developmental reading cluster, as indicated by the five colors in figure 4). The author entered the result of the Publish or Perish application into Vosviewer to see which keywords appeared frequently and were used for bibliometric analysis maps after counting for citation frequency and other metrics. Three alternative visualizations network, overlay, and density are used by the Vosviewer application to display the bibliometric mapping.

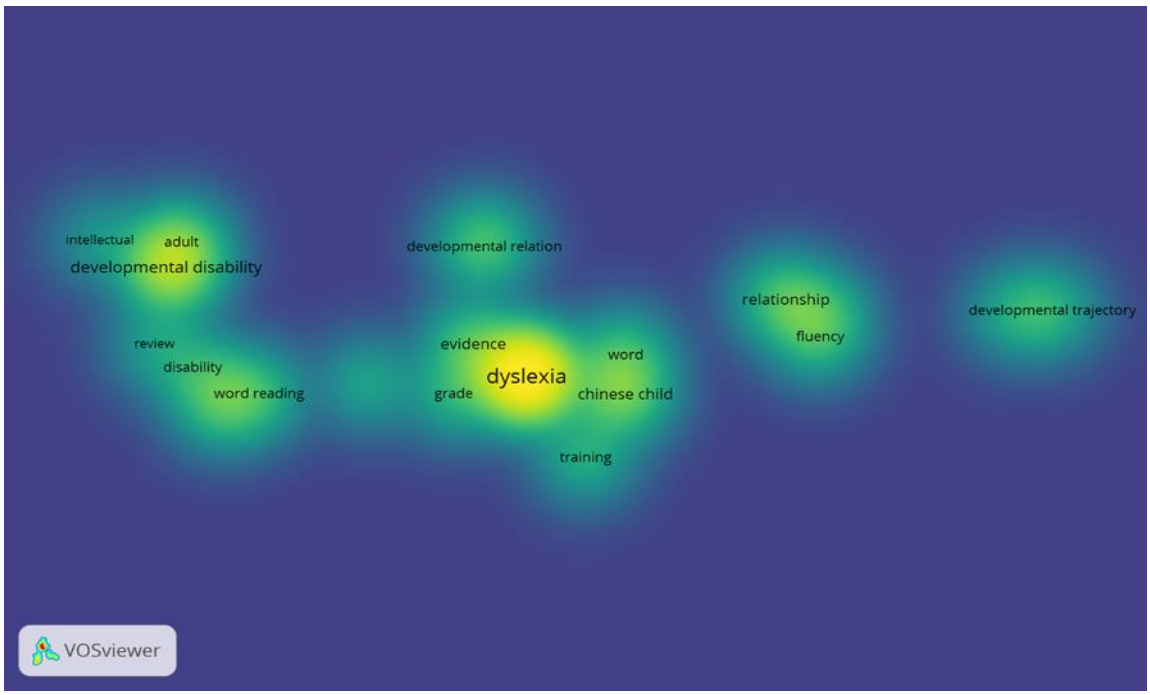

Figure 5. *Density visualization mapping*

Extracting from the title fields and full counting with a minimum of three occurrences, the authors get 465 terms, and 39 meeting the threshold. Additionally, the author discovered five clusters. Cluster 1 consisted of seven items (developmental study, developmental trajectory, difference, fluency, relationship), cluster 2 consisted of five items (developmental perspect, developmental trajectory, difference, fluency, relationship), cluster 3 consisted of four items (Chinese child, dyslexia, training, word), cluster 4 consisted of three items (adult, developmental disability, intellectual), and cluster 5 consisted of three items (developmental relation, evidence, reading comprehension).

Table 3. *Article with 10 or more citations*

NO	Cited	Per Year	Authors	Title	Year	Publication
1	67	0,71875	M.J. Snowling	Dyslexia and Developmental Language Disorder: comorbid disorders with distinct effects on reading comprehension	2020	Wiley-Blackwell Publishing Ltd
2	42	10.50	S.Ebert	Theory of mind, language, and reading: Developmental relations from early childhood to early adolescence	2020	Academic Press Inc.
3	34	0,305556	H.L. Storkel	The impact of dose and dose frequency on word learning by kindergarten children with developmental language disorder during interactive book reading	2019	American Speech-Language-Hearing Association (ASHA)
4	32	06.40	E.P. Galloway	Examining developmental relations between core academic language skills and reading comprehension for English learners and their peers	2019	American Psychological Association
5	28	0,25	C. Pecini	Training RAN or reading? A telerehabilitation study on developmental dyslexia	2019	American Psychological Association
6	27	0,302083	A. Cancer	The Effectiveness of Interventions for Developmental Dyslexia: Rhythmic Reading Training Compared With Hemisphere-Specific Stimulation and Action Video Games	2020	Frontiers Media S.A.
7	26	0,379861	F. Erbeli	Developmental dynamics between reading and math in elementary school	2021	Wiley-Blackwell Publishing Ltd
8	23	0,260417	A. Miyamoto	The developmental trajectory of intrinsic reading motivation: Measurement invariance, group variations, and implications for reading proficiency	2020	Academic Press Inc.
9	22	05.50	S.M. Adlof	Promoting reading achievement in children with developmental language disorders: What can we learn from research on specific language impairment and dyslexia?	2020	American Speech-Language-Hearing Association (ASHA)
10	22	07.33	G.K. Georgiou	Developmental Relations Between Home Literacy Environment, Reading Interest, and Reading Skills: Evidence From a 3-Year Longitudinal Study	2021	Wiley-Blackwell Publishing Ltd
11	21	04.20	C. Lebel	Developmental trajectories of white matter structure in children with and without reading impairments	2019	Elsevier Ltd.

12	20	04.00	D. Sewasew	The developmental dynamics of students' reading self-concept and reading competence: Examining reciprocal relations and ethnic-background patterns	2019	Elsevier BV
13	19	0,21875	S. Brem	Visual word form processing deficits driven by severity of reading impairments in children with developmental dyslexia	2020	Nature Publishing Group
14	18	0,166667	K. Chyl	Reading Acquisition in Children: Developmental 15Processes and Dyslexia-Specific Effects	2019	Elsevier Ltd.
15	17	0,254861	L.M. Pierson	Coaching parents of children with developmental disabilities to implement a modified dialogic reading intervention using low technology via telepractice	2021	American Speech-Language-Hearing Association (ASHA)

The results of this bibliometric analysis have important implications for educators, policymakers, and researchers engaged in reading development. The trends and clusters identified highlight areas where there are opportunities to innovate teaching practices and design evidence-based interventions. For example, research on dyslexia interventions has attracted considerable attention, suggesting increased attention to the creation of specialized teaching strategies that support students with reading disabilities. These strategies aim to address learning gaps by providing appropriate methods that address the unique challenges these students face.

Furthermore, the emphasis on reading comprehension strategies signals a growing recognition of the importance of equipping students with tools that enhance their ability to understand and retain information. This has led to a demand for scalable and accessible programs that can be adapted to different student profiles, promoting inclusion in the classroom. Educators are encouraged to integrate digital tools and culturally relevant practices into their pedagogy, enabling more dynamic, interactive, and adaptive teaching approaches that speak to a wide range of learners.

Policymakers, informed by visualizing research trends, can prioritize funding and resources toward under-researched but impactful areas, such as the intersection of developmental reading and digital literacy. This strategic allocation of resources ensures that emerging areas of concern, particularly those involving the integration of technology into reading instruction, receive the support needed for further development. By encouraging collaborations between key contributors and institutions identified through co-authorship networks, interdisciplinary efforts to address systematic gaps in reading instruction can be promoted.

Furthermore, the trends revealed in this bibliometric study provide guidance for establishing national or regional priorities that align with global advances in reading instruction. Policymakers can use this information to influence policy decisions that support innovation and equitable access to literacy programs. In particular, regions that have lagged behind in integrating digital literacy into reading education can benefit from adopting evidence-based practices that have proven successful in other parts of the world. This helps ensure that literacy initiatives remain relevant and effective in an increasingly digital learning environment.

However, this study is not without limitations. Bibliometric analyses are inherently limited by the scope and quality of the database used and, in this case, the use of Google Scopus may have excluded relevant articles from other databases, introducing potential biases in the presentation of the research findings. In addition, study inclusion criteria may limit the analysis, potentially overlooking smaller, region-specific studies or those published in languages other than English, which may limit the global applicability of the findings. This may lead to biased representations that favor more cited publications, especially in countries with higher research output. In addition, the analysis may be affected by publication bias, where studies

reporting significant results are more likely to be published and cited, leading to overemphasis on some interventions while neglecting important research contributions from others. These limitations highlight the need to triangulate bibliometric data with qualitative and meta-analytic approaches in future research. A more comprehensive approach, combining quantitative measures and qualitative information, provides a richer and more nuanced understanding of developmental reading, ensuring that underrepresented perspectives and emerging research are incorporated into educational policy and practice.

To address these challenges, future studies should expand the dataset by integrating databases such as Web of Science or PubMed, capturing a wider range of publications from different regions and research fields. This approach reduces bias and provides a more comprehensive view of the development reading landscape. In addition, conducting longitudinal citation analyses can reveal the lasting impact of key publications and identify emerging areas of research, thereby providing deeper insight into the evolution of interventions and theoretical frameworks in the field.

Future research should also integrate qualitative methods with bibliometric analysis to better understand how interventions are implemented in practice. This dual approach would provide a summary of the field and detailed information on policy implementation and classrooms. Cooperation between countries should be encouraged to promote intercultural perspectives, address regional limitations and foster the exchange of innovative practices. In addition, the integration of artificial intelligence and machine learning tools, such as natural language processing (NLP), can improve research understanding and improve bibliometric data analysis, making more applicable to educators and policy makers.

CONCLUSION

The conclusion of this study emphasizes that reading development is a skill that requires ongoing support to improve vocabulary, fluency, and comprehension. A bibliometric analysis of 111 articles from the Google Scopus database revealed considerable interest in the link between home learning environments and reading skill development, as well as innovations in teaching methods for children with special needs. Future research is recommended to explore the integration of digital literacy into reading education, especially for underserved groups, and to combine qualitative methods with bibliometric analyses to better understand classroom policies and instructional strategies. Cross-cultural cooperation is also needed to address regional constraints and enrich innovative practices. In practice, the results of this study can be applied to develop evidence-based teaching strategies, integrate digital tools, and provide inclusive programs tailored to student needs, while guiding decision-makers in prioritizing scarce funding but with high potential.

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