



Artificial Intelligence for Teaching Reading: A Bibliometric Analysis of Research Trends, Collaboration, and Scholarly Development

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Abstract

Artificial Intelligence (AI) has emerged as a transformative educational technology with potential to improve reading instruction through personalised learning, adaptive feedback, accessibility, and learner-centred pedagogical support. Despite increasing scholarly interest, research on AI for teaching reading remains fragmented across educational and technological domains. This study therefore conducts a bibliometric analysis of scholarships concerning Artificial Intelligence for teaching reading using data retrieved from the Scopus database. A total of 10,587 English language scholarly publications were analysed using bibliometric techniques, including keyword co-occurrence, co-authorship, and country-level scientific production visualised through VOSviewer. Findings indicate growing scholarly attention toward adaptive learning, intelligent tutoring systems, multilingual literacy support, learner engagement, accessibility, and AI literacy. However, challenges relating to digital inequality, infrastructure readiness, ethical governance, and teacher preparedness remain evident. The study provides evidence-based insights to inform future research, educational policy, and pedagogical practice concerning responsible and inclusive AI-supported reading education.

Keywords: Artificial Intelligence; Teaching, Reading, AI literacy, Pedagogical support

1. Introduction

Reading is a foundational skill that underpins academic success [1]. While the study of Paige et al. [2] highlights that it strengthens critical thinking as a predictor of reading, and lifelong learning. Further, the work of Goldman et al. [3] sees it as a gateway to knowledge acquisition across all disciplines. In contemporary education systems, the ability to read for meaning is essential for learner progression and overall educational attainment. However, global and local evidence suggests that many learners continue to struggle with reading proficiency, limiting their academic and socio-economic opportunities. Multiple studies highlighted that a significant proportion of learners are unable to read for meaning at grade-appropriate levels [4 - 7]. Stern et al. [8], highlights a persistent literacy crisis that affects both school and tertiary education outcomes. These challenges are often exacerbated by socio-economic inequalities, limited access to reading materials, and language barriers in multilingual contexts. At the same time, rapid advancements in Artificial Intelligence (AI) are transforming the educational landscape [9], by enabling more personalised, adaptive, and data-driven learning environments.

AI technologies, including natural language processing, machine learning, and intelligent tutoring systems, have increasingly been integrated into digital reading platforms to support learners' comprehension and engagement. Digital reading itself has evolved significantly, characterised by interactive, multimodal, and non-linear text engagement, which offers new opportunities for enhancing learning but also introduces challenges such as reduced deep reading and increased scanning behaviours. AI has the potential to mitigate these limitations by guiding learners through personalised reading pathways, providing real-time feedback, and adapting content to individual learning needs.

Despite significant advancements in Artificial Intelligence (AI)-enabled educational technologies, the integration of AI in teaching reading remains uneven, fragmented, and contextually dependent. Existing scholarship demonstrates that AI technologies possess considerable potential to improve reading comprehension, vocabulary acquisition, learner engagement, and personalised instructional support through adaptive learning systems, intelligent tutoring systems, AI-based chatbots, and generative technologies that tailor learning to individual learner needs [10 - 12]. Studies increasingly show that AI-supported reading systems can strengthen literacy development by improving learner interaction with reading materials, enabling personalised differentiation, and supporting adaptive feedback processes [12 -13]. For example, research examining AI-mediated reading environments demonstrates positive associations between AI-supported pedagogical interventions and learner reading achievement, motivation, self-efficacy, and critical thinking [12]. However, much of the literature remains concentrated on specific technological applications, isolated educational contexts, or discipline-



specific settings, thereby limiting broader understanding of scalable and sustainable AI implementation in literacy education across diverse educational systems [14 -15].

Moreover, several structural and institutional barriers continue to constrain the effective implementation of AI within reading education. Persistent challenges associated with digital inequality, inadequate technological infrastructure, insufficient educator preparedness, and concerns relating to ethical governance and learner privacy continue to influence educational adoption and implementation outcomes ([14 -15]. Studies further highlight concerns relating to uneven access to educational technologies, implementation costs, mismatched institutional readiness, and inadequate teacher competencies needed to support AI integration effectively within teaching and learning environments [16 -17]. These constraints may be particularly pronounced in multilingual, under-resourced, and socio-economically disadvantaged educational contexts, where technological disparities risk reinforcing rather than reducing educational inequalities. Importantly, despite growing scholarly attention toward AI supported educational interventions, there remains a lack of comprehensive synthesis capable of systematically mapping the intellectual structure, thematic evolution, publication trajectories, and collaboration patterns within the field, particularly regarding key dimensions such as personalisation, accessibility, learner outcomes, and educational inclusion.

The need for such synthesis is particularly critical within the Global South, where persistent structural inequalities in educational systems demand scalable, inclusive, and contextually responsive educational interventions. AI-supported reading technologies offer important opportunities to strengthen literacy development by improving access to reading materials, enabling multilingual educational support, enhancing adaptive instruction, and supporting personalised literacy pathways for diverse learner populations [10 -11,18]. Emerging scholarship further demonstrates that AI-mediated reading interventions may contribute to more inclusive educational environments through differentiated learning support and intelligent educational scaffolding capable of responding to learner variability and contextual constraints [14, 19]. However, without a systematic understanding of how scholarships in this domain have evolved, researchers, educators, and policymakers may struggle to identify dominant themes, conceptual gaps, and future research priorities capable of informing evidence-based educational interventions.

Therefore, this study aims to conduct a bibliometric analysis of Artificial Intelligence as a tool for teaching reading to map the intellectual structure of the field, analyse publication trends, and identify dominant scholarly themes concerning the current level of research, influential contributors, collaboration structures, and future research directions emerging within AI-supported reading education. Specifically, the study seeks to examine the growth trajectory of scientific output, identify influential authors and collaborative networks, and explore thematic clusters shaping scholarly development. By doing so, the study contributes toward a deeper understanding of how Artificial Intelligence is reshaping reading education and provides evidence-based insights capable of informing future research, educational policy, and pedagogical practice aimed at promoting inclusive and high-quality literacy education.

Accordingly, a bibliometric synthesis is necessary to map publication trends, scholarly collaboration, and conceptual development within the field.

Research Questions

RQ1: What are the publication trends and growth trajectories of research on Artificial Intelligence for teaching reading?

RQ2: Who are the most productive authors, institutions, countries, and collaborative networks in the field?

RQ3: What thematic and conceptual structures characterise scholarship on AI-supported reading education?

RQ4: What emerging research trends and future directions shape AI-supported reading instruction?

2. Literature Review

A growing body of scholarship demonstrates that AI can enhance reading instruction by supporting personalised learning and differentiated access to text. Wagner [12] argues that AI tools can assist teachers in adapting children's reading materials to different learner needs, thereby creating opportunities for personalised reading support in early childhood and elementary education. Similarly, Patel et al. [20] show that AI large language models can improve readability by simplifying educational materials to more accessible reading levels while retaining accuracy and content quality. These studies suggest that AI can support reading accessibility by modifying text complexity, scaffolding learner comprehension, and enabling more inclusive access to learning materials.



AI has also been explored as a mechanism for improving reading comprehension and learner engagement. Peng et al. [21], using PISA reading data across 32 OECD countries, found that ICT-related learner autonomy, competence, and school-level digital resources were associated with reading performance in blended learning settings. Their findings suggest that AI-informed and data-driven approaches can help educators better understand the relationship between digital learning environments and reading outcomes. Huang et al. [12] further demonstrate that graphical summarisation combined with AI-based chatbots can improve learners' reading comprehension achievement, motivation, self-efficacy, critical thinking, and cognitive load. This indicates that AI can strengthen reading instruction not only by providing content but also by supporting metacognitive engagement, feedback, and learner confidence.

In language education, AI-supported reading is increasingly linked to English as a Foreign Language (EFL) and multilingual learning contexts. Duc [19] conceptualises AI as a mediating tool for EFL reading innovation through the SAMR model, showing how AI can shift reading tasks from basic comprehension activities toward more inquiry-driven literacy practices. Feng et al. [21] similarly propose a generative pre-training-based intelligent tutoring system for English teaching, highlighting the potential of AI to address uneven access to personalised tutoring and learner support. In Kazakhstan, Kemelbekova et al. [23] found that AI chatbots can support English language learning by improving classroom interaction and learner experience. These studies suggest that AI may be particularly useful in multilingual and EFL contexts where learners require differentiated linguistic support, feedback, and guided practice.

Emerging research also highlights AI's role in early literacy and foundational reading development. Pistre et al. [13] examined the use of an AI-based conversational chatbot in kindergarten reading instruction and found that AI may support decoding practice and early grapheme phoneme correspondence development. This is important because early reading competence forms the basis for later reading fluency, comprehension, and academic success. Similarly, Renandya et al. (2026) argue that extensive reading can be reconceptualised in the age of AI, as intelligent systems may help provide abundant, comprehensible, and self-selected reading input while addressing practical challenges related to resources, assessment, and learner motivation.

Despite these opportunities, literature also identifies important constraints. Xia and Wang [14] note that although AI can improve college English instruction through personalised learning and efficiency, challenges remain regarding implementation costs, resource allocation, and teacher training. Lal et al. [15] similarly identify broader challenges in AI adoption in education, including ethical concerns, institutional preparedness, and uneven readiness for implementation. In rural and under-resourced contexts, [17] show that AI-augmented and culturally responsive multimedia can support EFL reading comprehension, but such interventions require contextual sensitivity, infrastructure, and pedagogical alignment. These findings suggest that AI-supported reading education cannot be separated from issues of digital inequality, teacher readiness, ethical governance, and local educational conditions.

Overall, the literature indicates that AI has considerable potential to support teaching reading through personalisation, adaptive feedback, accessibility, multilingual support, and learner engagement. However, current scholarship remains fragmented across different tools, educational levels, language contexts, and methodological approaches. There is therefore a need for bibliometric analysis to map the intellectual structure, publication trends, collaboration patterns, and thematic evolution of research on Artificial Intelligence as a tool for teaching reading.

3. Research Methodology

A bibliometric approach was adopted to examine scholarly production concerning Artificial Intelligence in teaching reading. The Scopus database was selected because of its extensive multidisciplinary coverage and citation metadata. The search string included terms related to artificial intelligence ("artificial intelligence" OR "AI" OR "machine learning" OR "natural language processing" OR "intelligent tutoring systems") AND ("reading" OR "reading comprehension" OR "literacy" OR "digital reading") AND ("education" OR "teaching" OR "learning" OR "instruction") Boolean operators AND OR were employed to combine concepts and maximise retrieval accuracy while maintaining relevance. Table 1 illustrate the inclusion criteria restricted the analysis to articles and scholarly documents written in English. From an initial dataset of 23,275 retrieved publications, a total of 10,587 articles and documents met the inclusion criteria and were retained for analysis.



Table 1. Documents published in Scopus

Document type	Number of results
Article	11,030
Conference paper	8,155
Book chapter	1,495
Book	460
Other	2135
Total	23275
Inclusion: Articles and written in English	10587

3.1 Keyword Co-Occurrence Network

Keyword co-occurrence Network in Figure 1, reveals that the intellectual evolution of artificial intelligence scholarship between 2021 and 2025. Early research focused predominantly on technical applications of machine learning, including image processing, segmentation, data mining, and intelligent tutoring systems. From 2023 onward, scholarships increasingly shifted toward interdisciplinary and human-centred applications involving information literacy, explainable AI, telemedicine, and critical thinking. More recent studies (2024–2025) demonstrate strong emphasis on AI literacy, large language models, patient education, and generative AI platforms such as ChatGPT-4o, Claude, and Google Gemini. The prominence of keywords such as artificial intelligence, machine learning, AI literacy, and large language models suggests an emerging paradigm shift toward responsible, competency-driven, and human-centred AI integration across education and healthcare contexts.

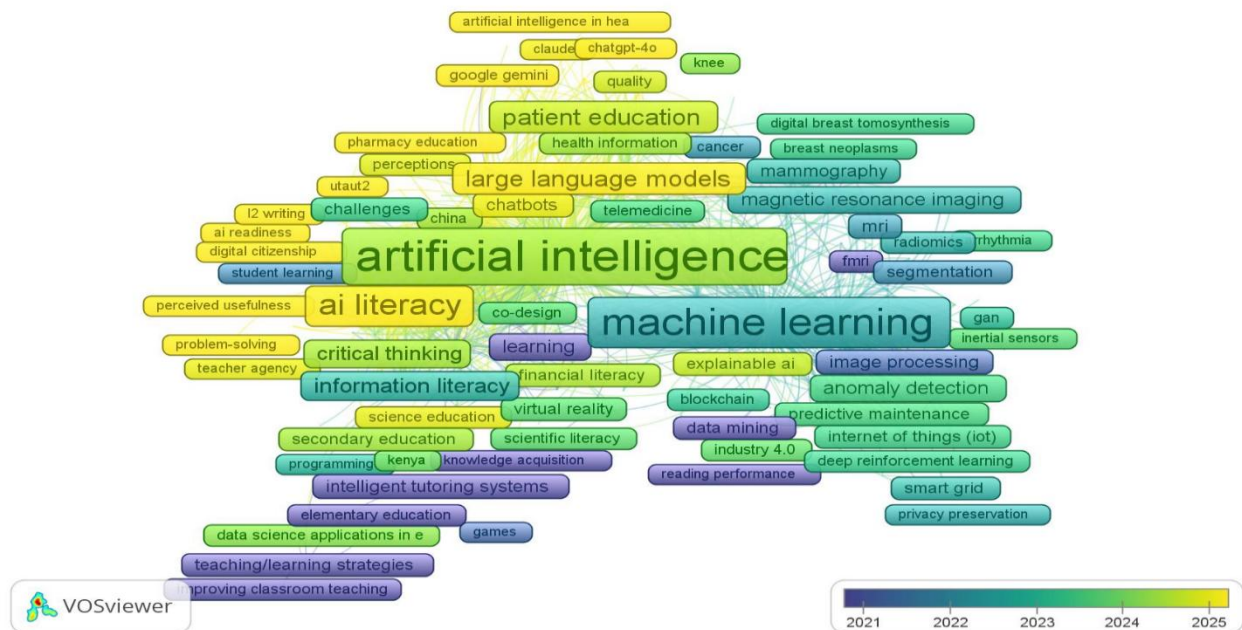


Fig. 1. Keyword Co-occurrence Network

3.2 Co-Authorship Network

The co-authorship analysis in Figure 2, identified 84 authors distributed across 12 collaboration clusters, revealing a fragmented yet moderately interconnected scholarly network. The visualisation indicates the presence of several central collaborative nodes, particularly around authors such as Wang Ying, Zhang Yu, and Zhang Wei, who appear to function as bridging scholars linking multiple research groups. While collaboration is evident, the high number of clusters relative to total items suggests dispersed research activity characterised by small institutional or thematic teams. Peripheral authors and isolated subgroups further indicate limited cross-cluster collaboration, highlighting opportunities for stronger international and interdisciplinary partnerships within the field.

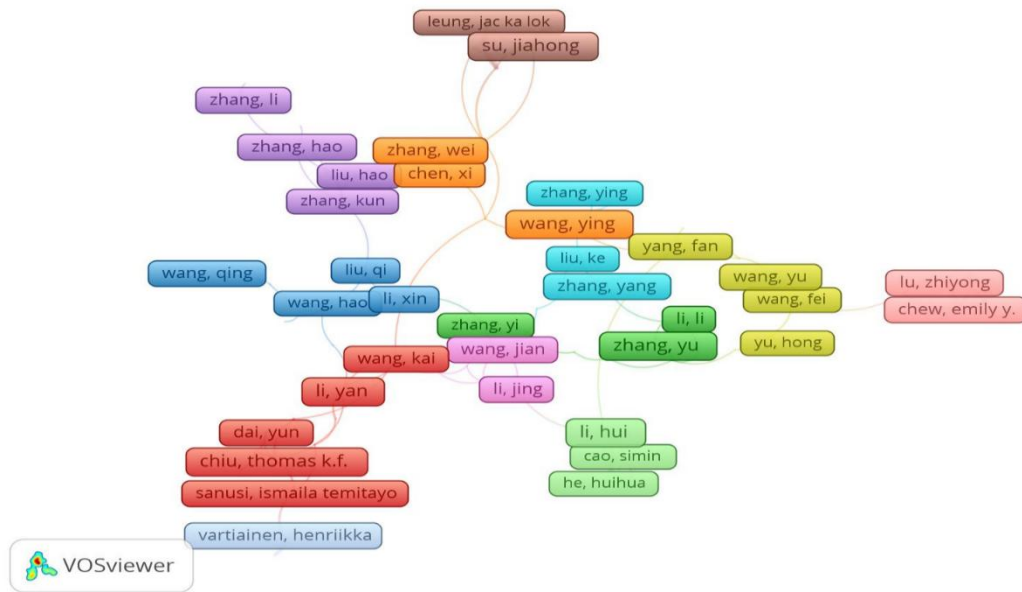


Fig. 2. Co-authorship network

3.3 Country Level Production

Country-level scientific production in Figure 3 provides important insights into geographical distribution, intellectual concentration, and internationalisation of scholarship concerning Artificial Intelligence (AI) as a tool for teaching reading. Countries with stronger technological infrastructures and advanced higher education systems appear to contribute more substantially to the development of AI-supported reading scholarship, particularly in relation to intelligent tutoring systems, adaptive learning environments, personalised literacy instruction, and generative AI applications [10, 15]. These findings suggest that scientific production in this domain remains closely associated with national investments in digital education, technological innovation, and educational transformation agendas.

Importantly, the findings suggest that Global South representation remains comparatively limited, despite the significant literacy challenges affecting many developing educational systems. This imbalance is noteworthy because multilingualism, educational inequality, teacher shortages, limited instructional resources, and infrastructural constraints remain particularly pronounced across many Global South contexts [5; 8]. Consequently, there exists an important opportunity for future scholarship to strengthen representation from under-researched educational systems and to examine context-sensitive approaches to AI-supported literacy instruction in resource-constrained settings.

Documents by country or territory

Compare the document counts for up to 15 countries/territories.

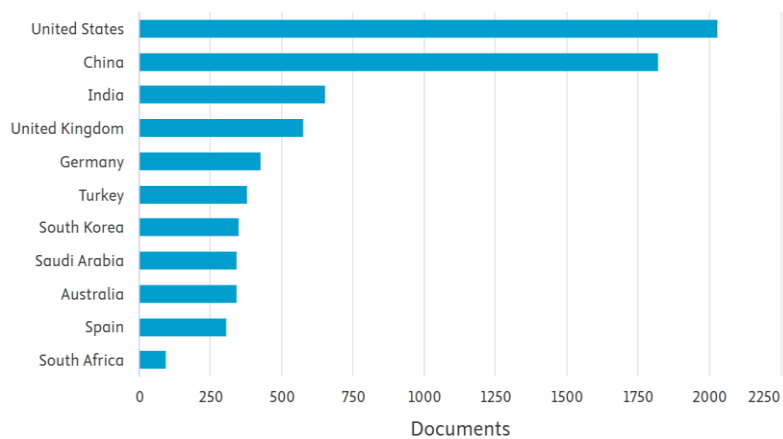


Fig. 3. Countries' level of documents



4. Limitations

This study relied exclusively on the Scopus database as the source of scholarly publications. Although Scopus is widely recognised as one of the largest and most comprehensive citation databases, reliance on a single database may have limited the retrieval of relevant studies indexed in alternative sources such as Web of Science, ERIC, IEEE Xplore, ACM Digital Library, SpringerLink, and Google Scholar. Consequently, relevant scholarships concerning AI-supported reading instruction may not have been fully captured. Additional limitations include English-language bias, exclusion of grey literature, potential keyword-search limitations, and reliance on bibliometric techniques that may not fully capture contextual or pedagogical nuances.

5. Conclusion and Future Research Avenues

The primary objective of this study was to examine the intellectual structure and scientific development of scholarship concerning Artificial Intelligence as a tool for teaching reading through a bibliometric analysis of scholarly literature. By systematically analysing publication patterns, thematic evolution, collaboration structures, and conceptual relationships, the study sought to map current scientific development and identify future research directions shaping AI-supported literacy education.

The findings reveal that scholarships concerning AI supported reading instruction constitute an emerging yet rapidly expanding field, characterised by increasing interdisciplinary integration and growing pedagogical relevance. Publication trends demonstrate increasing scholarly attention toward adaptive learning, intelligent tutoring systems, personalised literacy support, learner engagement, accessibility, and multilingual educational technologies. At the same time, keyword co-occurrence analysis suggests a clear thematic transition from technology-oriented experimentation toward more learner centred, pedagogically meaningful, and ethically informed educational applications.

The co-authorship and country analyses further indicate that while scholarship demonstrates increasing collaboration and internationalisation, scientific production remains moderately fragmented and geographically uneven. Contributions appear concentrated within technologically advanced educational systems, while representation from Global South educational environments remains comparatively limited despite persistent literacy challenges requiring scalable educational interventions.

Importantly, the findings reinforce the growing significance of Artificial Intelligence as a pedagogical mechanism capable of supporting literacy development through personalised learning, adaptive instruction, intelligent feedback systems, multilingual educational support, and educational accessibility. However, the study simultaneously highlights persistent implementation barriers relating to digital inequality, infrastructure limitations, teacher preparedness, learner privacy, ethical governance, and responsible technological integration.

Future scholarship should therefore prioritise longitudinal learner outcomes, teacher readiness and educator competencies, Global South and multilingual educational contexts, and the pedagogical effectiveness of generative AI technologies in reading instruction. More specifically, future research should investigate how conversational AI systems, intelligent tutoring agents, adaptive literacy platforms, and large language models may be implemented responsibly while simultaneously protecting learner autonomy, promoting educational equity, and improving literacy attainment.

Future research may further benefit from mixed-method, comparative, and context-sensitive research designs capable of integrating bibliometric evidence with systematic literature reviews, classroom interventions, qualitative inquiry, and educational effectiveness studies. Such approaches may provide deeper understanding regarding the educational impact, scalability, and contextual relevance of AI-supported literacy interventions.

Overall, the study demonstrates that Artificial Intelligence scholarship in teaching reading is evolving toward a more coherent, pedagogically grounded, and socially relevant field of inquiry. Through responsible implementation, stronger interdisciplinary collaboration, and contextually informed educational innovation, Artificial Intelligence may contribute substantially toward improving literacy outcomes and advancing equitable, inclusive, and high-quality education.

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