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Global Research Landscape of Collaborative Learning in Speaking Skills: A Bibliometric Analysis (2016–2025)

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Abstract: This study aims to map and synthesize research trends on collaborative learning in enhancing speaking skills from 2016 to 2025. Using a bibliometric mapping approach, data were retrieved from the Scopus database through a TITLE-ABS-KEY search using the keywords "collaborative learning" and "speaking." From an initial 610 records, exclusion criteria were applied (2016–2025; document types: article, conference paper, book chapter, review; English only), resulting in 410 documents for analysis. The results show a clear upward trend in publications, with rapid growth in the most recent years. Core dissemination outlets include both language-education journals and technology-oriented proceedings, while author contributions are distributed with a small group of recurring prolific authors. China and the United States are leading contributor countries, and keyword mapping indicates that "collaborative learning" is the central theme, increasingly linked to technology-mediated and AI-related terms in the later period. The novelty of this study lies in providing an integrated Scopus-based bibliometric overview of growth, sources, authors, countries, keywords, and thematic evolution. Practically, findings inform educators and curriculum designers on designing collaborative speaking instruction supported by appropriate learning technologies. This review contributes a structured research landscape and directions for future longitudinal, comparative, and process-focused investigations.

Keywords: Collaborative Learning, Keyword Co-Occurrence, Scopus Bibliometric Mapping, Speaking Skills

A. Introduction

Speaking skill constitutes a core dimension of communicative competence in second and foreign language education, particularly within Indonesia as a Foreign Language (EFL) contexts(Nabilla et al., 2025; Shadiev et al., 2024). Oral communication is not only an instructional goal but also a primary medium through which learners negotiate meaning, demonstrate proficiency, and engage in social interaction(Aksoy-Pekacar, 2024; Kamata et al., 2025; Valls Martínez et al., 2024). Despite its importance, speaking remains one of the most challenging language skills for EFL learners,

frequently hindered by limited exposure, insufficient interactional opportunities, speaking anxiety, and low self-confidence ((Hwang et al., 2024; Wilson & Lewandowska-Tomaszczyk, 2019)). These persistent challenges have motivated educators and researchers to explore pedagogical approaches that promote interaction, learner engagement, and authentic language use.

Collaborative learning has emerged as a prominent instructional approach to address these challenges. Rooted in social constructivist and sociocultural perspectives, collaborative learning emphasizes knowledge construction through social interaction, peer mediation, and shared responsibility for learning ((Biggs, 2025; Ebadi & Azizimajd, 2024; Salinas et al., 2021)). In language learning contexts, collaborative environments provide learners with opportunities to practice speaking meaningfully, negotiate linguistic forms, receive peer feedback, and gradually move from other-regulation to self-regulation within their zones of proximal development ((Al-Qadi et al., 2025; Yousif, 2025)). As such, collaborative learning has been widely associated with improvements in oral fluency, pronunciation accuracy, communicative confidence, and willingness to communicate.

Between 2016 and 2025, research on collaborative learning in speaking instruction has shown notable growth, reflecting broader shifts toward learner-centered and interaction-driven pedagogies. Early studies within this period predominantly examined face-to-face collaborative practices, such as role-plays, group discussions, and task-based instruction, demonstrating their effectiveness in enhancing speaking performance and reducing learner anxiety ((Fuller et al., 2021; Mastalerz et al., 2021; Nandamudi & Cunningham, 2024)). These studies highlighted the importance of structured peer interaction in creating supportive learning environments that facilitate oral language development.

As digital technologies became increasingly integrated into education, research attention expanded toward technology-supported collaborative learning models(S.-W. Lin & Bollen, 2025; H. Wang, 2025). Mobile-assisted language learning (MALL), computer-supported collaborative learning (CSCL), and online collaborative learning (OCL) were widely investigated for their potential to extend speaking practice beyond traditional classrooms. Empirical findings indicate that smartphone-based collaborative projects, video-mediated group work, and online discussion platforms can significantly enhance learners' speaking skills and engagement (Huang, 2021; Y.-C. Wang, 2020)). In rural and under-resourced contexts, online collaborative learning has also been reported to promote social interaction and psychological support, despite challenges related to infrastructure and learner participation (Amante, 2025; Ochoa et al., 2023)

More recent studies (2023–2025) reflect an emerging research focus on advanced digital and immersive technologies within collaborative speaking instruction.

Artificial intelligence (AI), virtual reality (VR), and human–machine collaborative learning environments have been shown to facilitate contextualized speaking practice, reduce anxiety, and support oral fluency development (V. Lin et al., 2023; Tai & Chen, 2024; Xie et al., 2025). These studies suggest that collaborative learning is evolving into complex, multimodal ecosystems where learners interact not only with peers and teachers but also with intelligent technologies. Such developments indicate a dynamic and rapidly expanding research landscape.

The current state of research demonstrates that collaborative learning is widely acknowledged as an effective approach for enhancing speaking skills across diverse educational levels and contexts. Empirical studies consistently report positive impacts on speaking performance, motivation, and learner attitudes (Alzubi et al., 2025; Yousif, 2025). Moreover, collaborative learning has been applied through various instructional models, including cooperative learning, project-based learning, task-based instruction, and technology-enhanced collaboration. This diversity reflects the adaptability of collaborative learning to different pedagogical goals and learning environments.

However, the literature also reveals fragmentation in terms of research focus, methodological approaches, and contextual coverage. Studies vary considerably in their research designs, participant characteristics, technological tools, and outcome measures. While some research emphasizes affective factors such as anxiety and motivation (Alzubi et al., 2025), others focus primarily on linguistic outcomes such as fluency, accuracy, and pronunciation (Ebadi & Azizimajd, 2024; Y.-C. Wang, 2020). Furthermore, although individual studies provide valuable insights, there is limited synthesis regarding publication trends, influential journals, leading scholars, and geographical contributions within this research domain.

The novelty of this study lies in its systematic and bibliometric synthesis of Scopus-indexed research on collaborative learning in enhancing speaking skills published between 2016 and 2025. Unlike previous reviews that focus on specific technologies or instructional models, this study offers a comprehensive overview of the field by mapping publication growth, identifying leading source titles and authors, analyzing country-level contributions, and examining keyword trends. By integrating bibliometric indicators with thematic analysis, this review provides a macro-level perspective that has been largely absent in existing literature. Additionally, this study contributes novelty by consolidating empirical evidence across face-to-face, blended, online, and technology-enhanced collaborative learning contexts. In doing so, it captures the evolution of collaborative speaking instruction over the past decade and highlights emerging research directions, particularly the increasing role of digital and AI-supported collaboration. This temporal and thematic mapping enables a clearer understanding of how the field has developed and where future research efforts may be directed.

This systematic literature review makes several important contributions. Theoretically, it strengthens the evidence base supporting collaborative learning as a socially grounded and pedagogically robust approach to speaking development. Methodologically, it demonstrates the value of Scopus-based systematic reviews in synthesizing high-quality, peer-reviewed research. Practically, the findings offer insights for educators, curriculum designers, and policymakers seeking to implement effective collaborative strategies for speaking instruction across varied educational contexts. By identifying dominant research themes, influential contributors, and underexplored areas, this study also provides a foundation for future empirical investigations. In particular, it highlights the need for more longitudinal studies, comparative analyses across contexts, and deeper exploration of emerging technologies within collaborative speaking instruction.

Based on the identified research gaps and objectives, this study addresses the following research questions:

1. How has the research output on collaborative learning in enhancing speaking skills evolved from 2016 to 2025?
2. Which source titles have contributed the most to publications on collaborative learning in enhancing speaking skills during this period?
3. Who are the most prominent authors in the field of collaborative learning and speaking skills from 2016 to 2025?
4. Which countries have contributed the most research on collaborative learning in enhancing speaking skills?
5. What are the most frequently occurring keywords in studies on collaborative learning and speaking skills from 2016 to 2025?
6. What is the overall research landscape and emerging trends in collaborative learning for speaking skills during this period?

B. Methods

This study adopted a bibliometric mapping approach to systematically examine research trends on collaborative learning in enhancing speaking skills published between 2016 and 2025. Bibliometric analysis enables the quantitative evaluation of large volumes of scholarly publications by examining patterns in publication output, authorship, keywords, and collaboration networks. This method was selected to provide a comprehensive and objective overview of the intellectual structure and development of research in the field of collaborative learning and speaking instruction over the past decade (Bancong et al., 2021; Fiskawarni et al., 2025; Nurfadilah et al., 2025).

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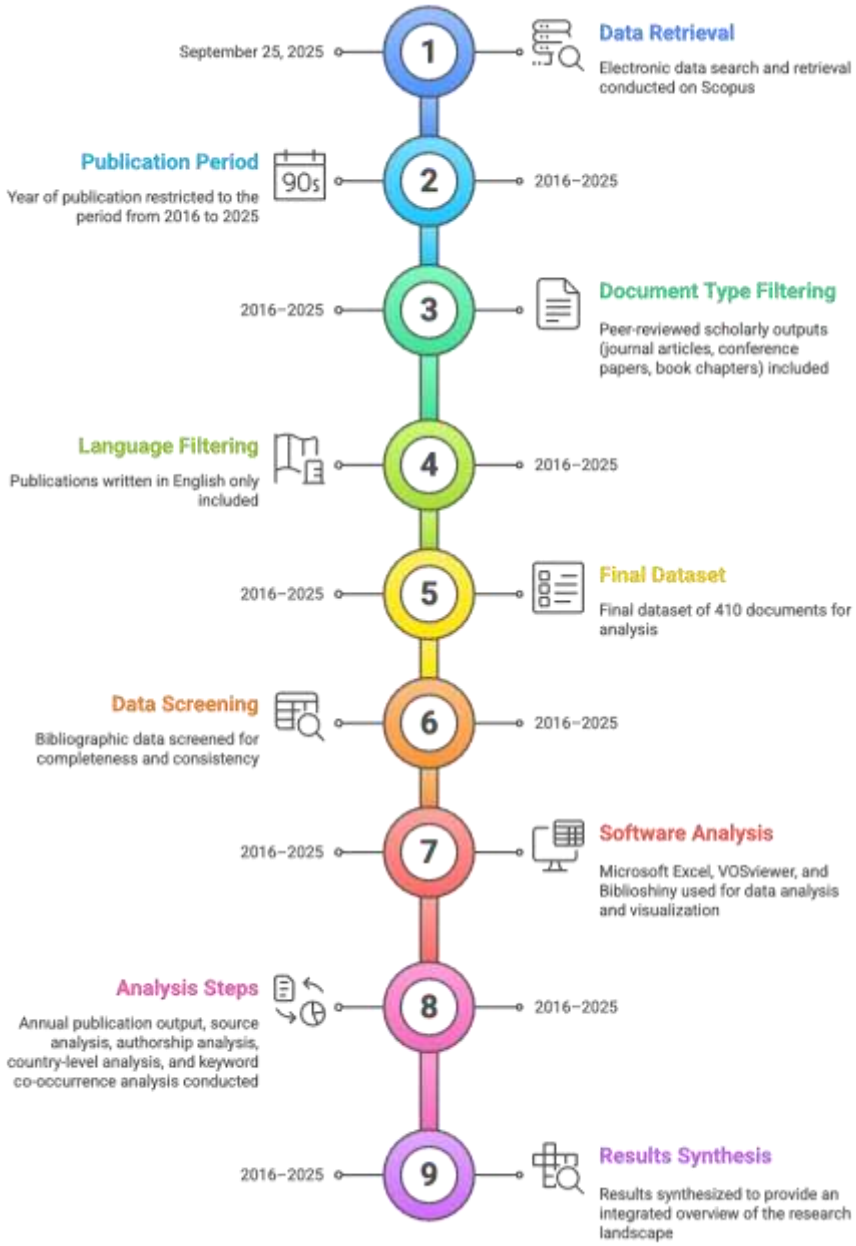

Figure 1 Data Analysis Process

The data for this study were sourced exclusively from the Scopus database (https://www.scopus.com), which is recognized for its extensive coverage of high-quality, peer-reviewed academic publications across disciplines. Using Scopus ensured consistency in bibliographic metadata and facilitated reliable bibliometric analysis. The electronic data search and retrieval were conducted on September 25, 2025. To capture studies directly relevant to the research focus, the search was performed using the TITLE-ABS-KEY field, which includes article titles, abstracts, and author-provided keywords. The search keywords applied were "collaborative learning" AND "speaking." This keyword combination was chosen to ensure that

retrieved documents explicitly addressed both the pedagogical approach and the targeted language skill. The initial search yielded 610 documents, representing a broad dataset of potentially relevant publications. No additional filters were applied at this stage to avoid premature exclusion of relevant studies.

Subsequently, a series of exclusion criteria were systematically applied to refine the dataset. First, the year of publication was restricted to the period from 2016 to 2025, in accordance with the scope of this study. This criterion reduced the dataset to 458 documents. Second, document type filtering was applied to include only peer-reviewed scholarly outputs, namely journal articles, conference papers, and book chapters, resulting in 423 documents. Third, language filtering was conducted to include only publications written in English, ensuring consistency and accessibility for analysis. After applying all exclusion criteria, the final dataset consisted of 410 documents, which formed the corpus for bibliometric analysis.

The finalized bibliographic data were downloaded from the Scopus database in comma-separated values (CSV) and Research Information System (RIS) formats. These formats allowed for seamless data processing and compatibility with bibliometric analysis tools. Prior to analysis, the data were screened for completeness and consistency, including verification of publication years, author names, source titles, and keyword entries. Three software tools were used for data analysis and visualization. Microsoft Excel was employed for initial data organization, cleaning, and descriptive statistical analysis, such as counting annual publications and summarizing document characteristics. VOSviewer was used to construct and visualize bibliometric networks, including keyword co-occurrence maps, co-authorship networks, and country collaboration networks. This tool enabled the identification of thematic clusters and collaboration patterns based on frequency and link strength. In addition, Biblioshiny, the web-based interface of the Bibliometrix package, was utilized to perform advanced bibliometric analyses, including annual publication trends, most productive sources, leading authors, and keyword frequency analysis.

The data analysis process was conducted in several sequential steps shown in figure 1. First, annual publication output was analyzed to identify growth patterns and research trends over the 2016–2025 period. Second, source analysis was performed to determine the most productive journals and conference proceedings contributing to the field. Third, authorship analysis examined the most prolific authors and patterns of scholarly collaboration. Fourth, country-level analysis was carried out using authors' affiliation data to identify geographical distribution and international research contributions. Fifth, keyword co-occurrence analysis was conducted to identify dominant themes and emerging topics related to collaborative learning and speaking skills.

Finally, the results from these analyses were synthesized to present an integrated overview of the research landscape on collaborative learning in enhancing speaking skills. By combining descriptive indicators and visual network analyses, this study provides a systematic and comprehensive mapping of publication trends, thematic development, and scholarly contributions within the field.

C. Results and Discussion

Result

Growth of Research Output on Collaborative Learning in Enhancing Speaking Skills (2016–2025)

The analysis of annual publication output reveals a clear upward trend in research on collaborative learning for speaking skills over the ten-year period (Figure 2). In the early phase (2016–2019), the number of publications remained relatively modest, with outputs ranging from 17 to 26 documents per year. This stage reflects an emerging research interest primarily focused on classroom-based collaborative speaking practices. A gradual increase is evident from 2020 (32 documents) to 2021 (35 documents), followed by a more pronounced rise in 2022 (46 documents). Although there was a slight decline in 2023 (41 documents), the field experienced a substantial surge in the final two years, reaching 73 documents in 2024 and peaking at 94 documents in 2025. This sharp growth suggests intensified scholarly attention, likely influenced by increased adoption of digital, online, and AI-supported collaborative learning environments. Overall, the publication trend indicates that collaborative learning has become a central and expanding research focus in speaking skills development.

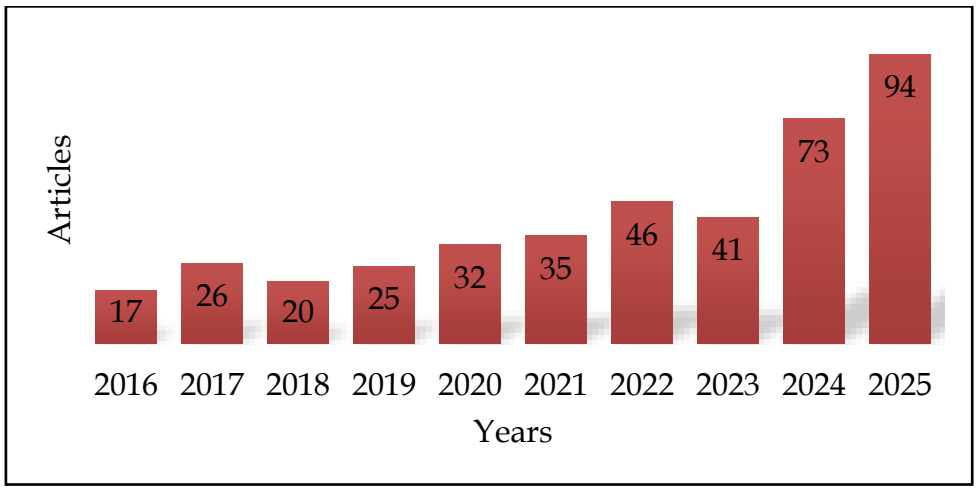

Figure 2 Annual Publication Trends on Collaborative Learning in Enhancing Speaking Skills (2016–2025)

Most Productive Source Titles

The source analysis shows that research on collaborative learning and speaking skills is distributed across a range of journals and conference proceedings, with a concentration in outlets related to language education and educational technology (Figure 3). The most productive source is the ACM International Conference Proceeding Series (7 documents), followed by Lecture Notes in Computer Science (6 documents) and the World Journal of English Language (6 documents).

Several well-established journals contributed five documents each, including Asian EFL Journal, Computer Assisted Language Learning, Computers and Education, International Journal of Learning, Teaching and Educational Research, and Language Learning and Technology. The presence of both education-focused journals and technology-oriented proceedings highlights the interdisciplinary nature of the field, where pedagogical concerns intersect with technological innovation.

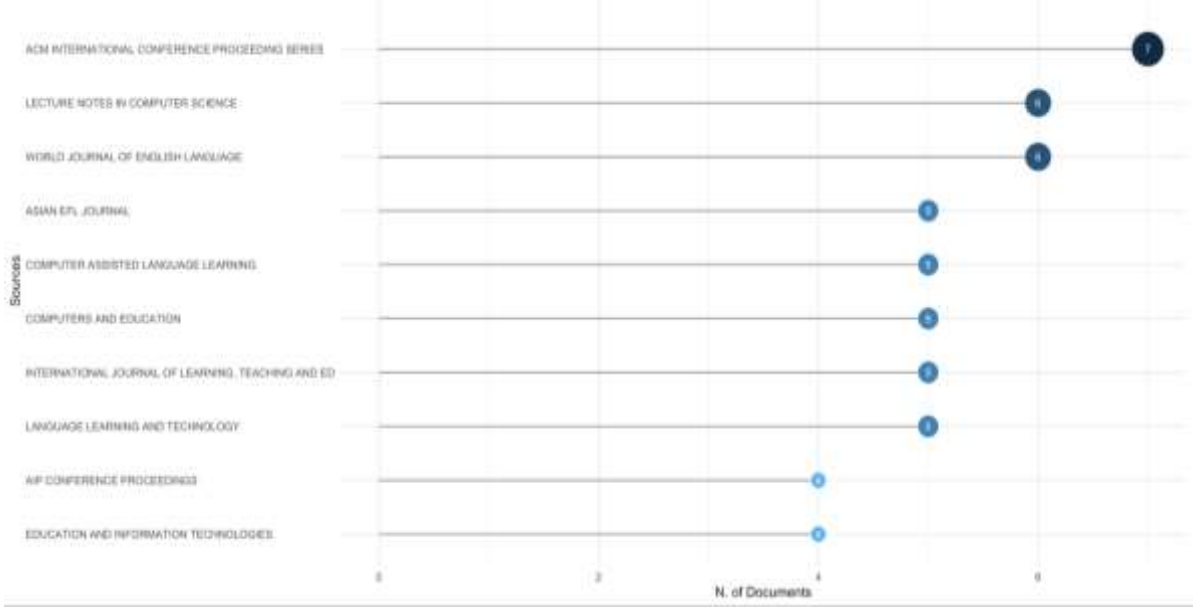

Figure 3 Most Productive Source Titles

Most Prominent Authors

Authorship analysis indicates that the research field is characterized by distributed scholarly contributions rather than dominance by a single author or research group (Figure 4). The most prolific authors are Wang Y and Yunus MM, each contributing four publications. Several authors, including Bruno B, Hwang G, Hwang WY, Kim Y, and Li Y, contributed three publications each.

A number of authors published two documents, such as Ahmad J, Alzubi AAF, and Anumula VSS. This pattern suggests that collaborative learning in speaking skills is

investigated by diverse researchers across different institutional and national contexts, with moderate continuity of contribution among a limited group of scholars.

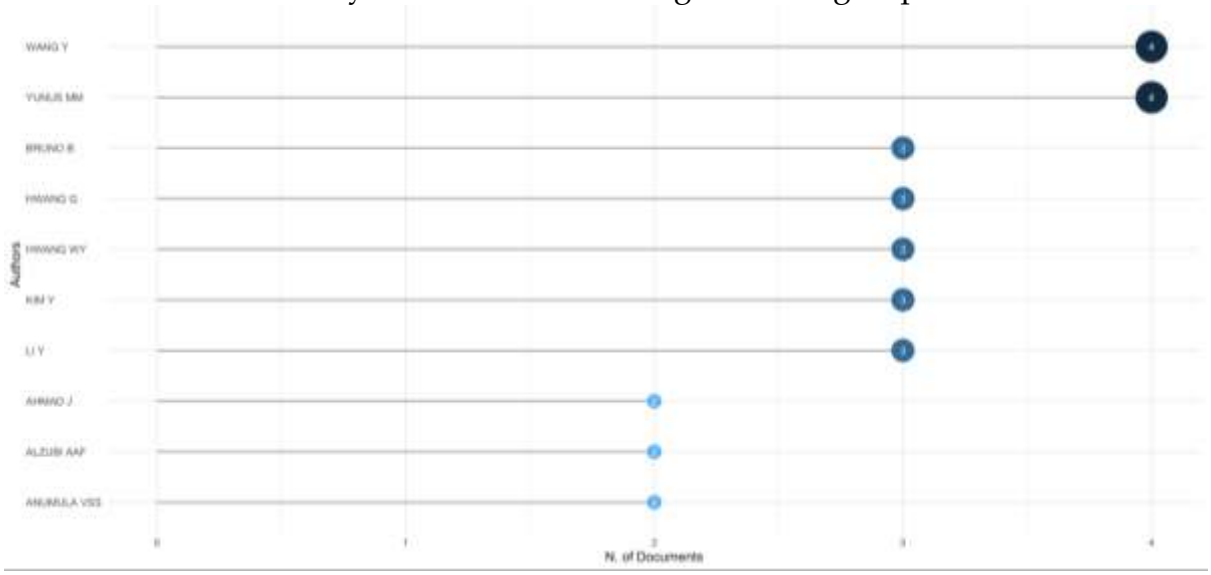

Figure 4 Top 10 Authors that Contribute for Publication

Authorship and Institutional Collaboration Patterns

The collaboration patterns among countries, authors, and institutions are illustrated through a three-fields plot (Figure 5). The visualization reveals strong linkages between corresponding authors' countries, prolific authors, and their institutional affiliations. China and the United States emerge as the most influential contributor countries, with strong connections to highly productive authors such as Wang Y, Hwang G, and Hwang WY. These authors are predominantly affiliated with technology-oriented and research-intensive universities, including National Taiwan University of Science and Technology and Najran University. In addition, the diagram indicates increasing participation from countries such as Malaysia, Indonesia, and Saudi Arabia, which are connected to both regional and international institutions. The presence of cross-country linkages suggests growing international collaboration in research on collaborative learning and speaking skills. Overall, the results highlight that scholarly production in this field is supported by interconnected networks of countries, authors, and institutions rather than isolated research efforts.

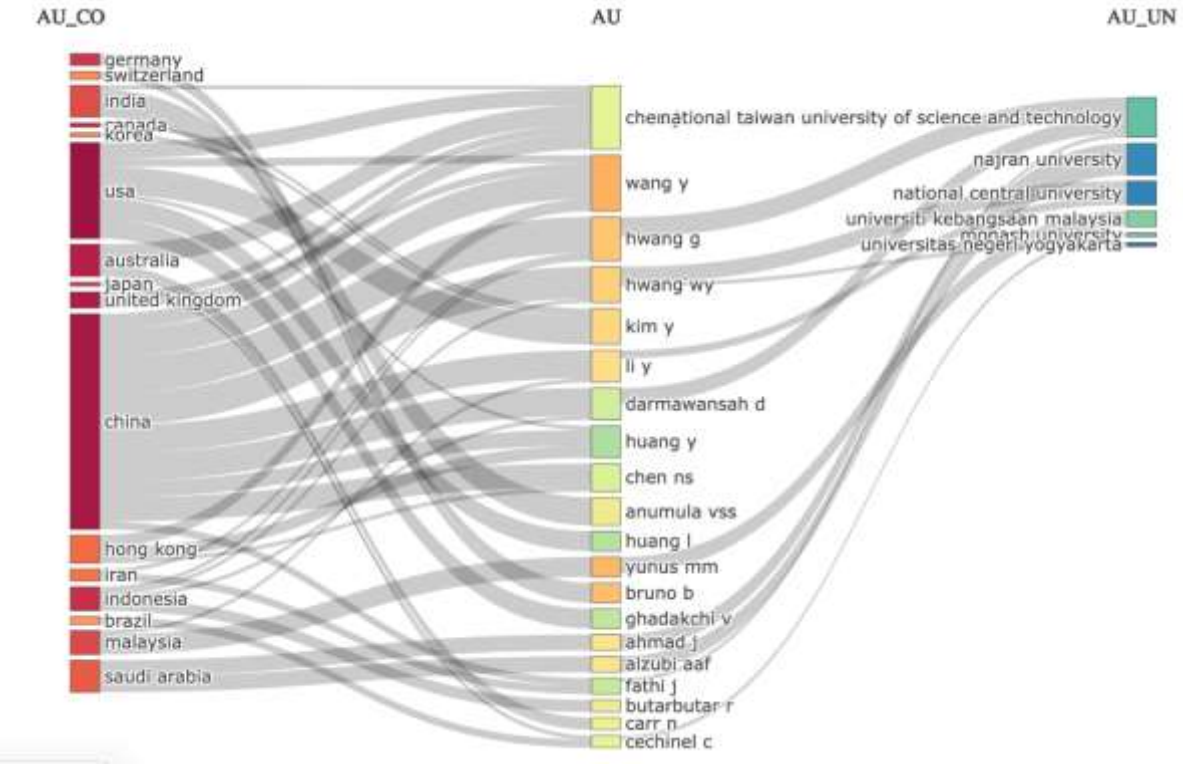

Figure 5 Three Field Plot of Authors, Author Country, and Affiliation

Countries with the Highest Research Output

The country-level analysis based on corresponding authors' affiliations demonstrates a globally distributed research landscape (Figure 6). China emerges as the leading contributor, followed by the United States, both showing substantially higher publication counts compared to other countries. The next tier includes the United Kingdom and Australia, indicating strong research activity in both Asian and Anglophone contexts.

Additional contributions come from countries such as Iran, Malaysia, Thailand, Canada, Indonesia, India, Spain, Japan, Saudi Arabia, Turkey, and Germany. The visualization distinguishes between single-country publications (SCP) and multiple-country publications (MCP), revealing the presence of international collaboration, although single-country studies remain predominant. These results suggest that collaborative learning and speaking skills constitute a global research concern, particularly in EFL-oriented regions.

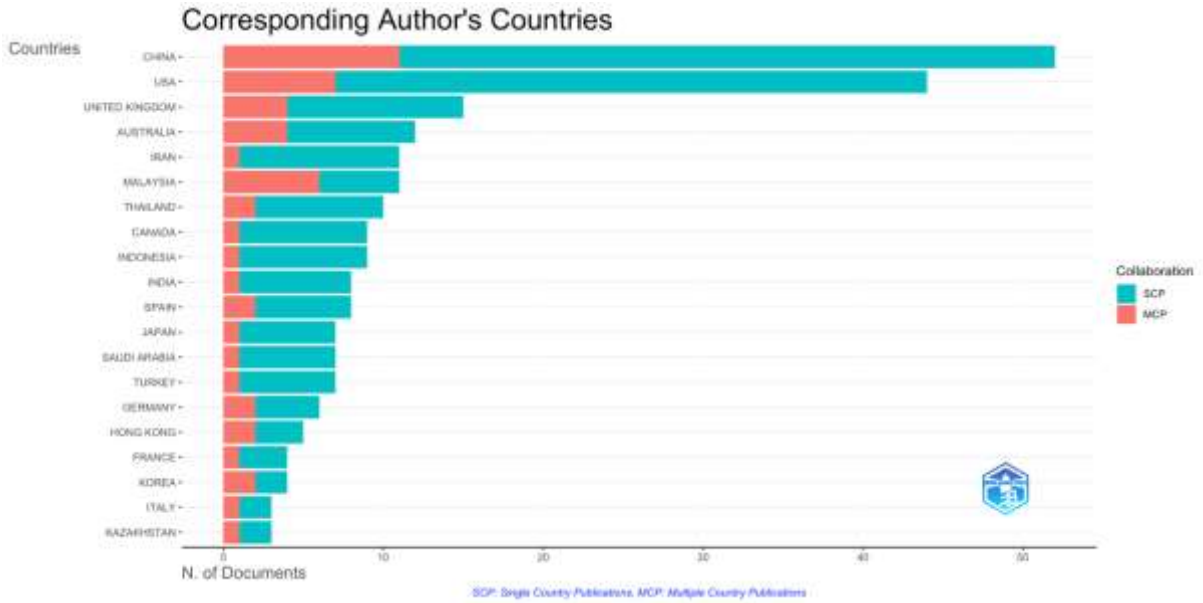

Figure 6 Corresponding Author's Counties: Geographical Collaboration: Single-Country and Multiple-Country Publications

Most Relevant Keywords and Research Themes

Keyword frequency and co-occurrence analysis reveals the dominant conceptual structure of the field (Figure 7). The most frequent keyword is "collaborative learning" (86 occurrences; 11%), followed by "students" (59; 8%) and "human" (39; 5%). Other prominent terms include "teaching" (33; 4%), "e-learning" (30; 4%), "humans" (30; 4%), and "education" (28; 4%). Speaking-related terms such as "speech" (22; 3%), "speaking skills" (13; 2%), and "speaking" (12; 2%) confirm the strong focus on oral communication outcomes. Notably, emerging technology-oriented keywords, including "artificial intelligence" (16; 2%) and "machine learning" (10; 1%), indicate increasing research interest in advanced digital and AI-supported collaborative speaking environments.

The VOSviewer network overlay (Figures 8) further suggests that "collaborative learning" functions as a central hub connected to multiple sub-themes pedagogy (e.g., teaching, curriculum), learner focus (students), and technology-mediated learning (e-learning, learning systems). This interconnected structure indicates that the research landscape is not isolated around one method but organized into overlapping clusters where speaking development is examined through pedagogical practices and technology-enhanced collaboration.

Figure 7 Tree Map of Authors' Keywords

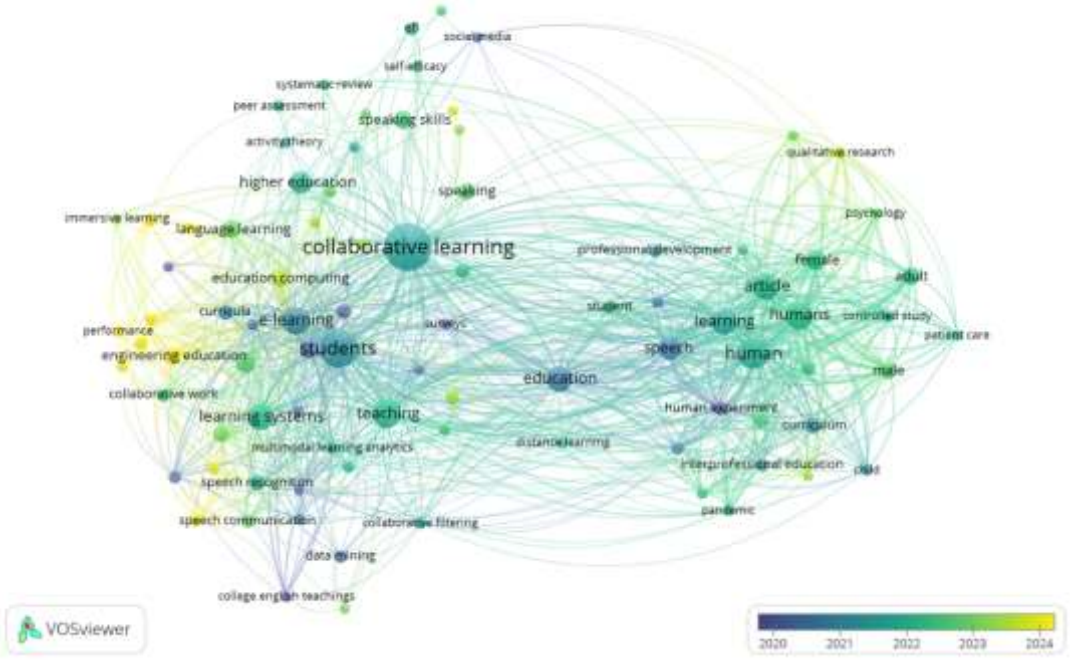

Figure 8 Keywords Co-Occurrence Analysis by Overlay Visualization

Current Research Landscape and Thematic Evolution

The thematic evolution analysis illustrates how research priorities have shifted over time (Figure 9 and 10). During 2016–2019, research emphasized foundational themes such as collaboration, learning systems, distributed computer systems, and computer-aided instruction. In 2020–2022, the literature consolidated around collaborative learning, teaching, education, and multi-modal learning, reflecting expanded methodological approaches.

In 2023–2024, learner-centered themes such as students, higher education, activity theory, and qualitative research became more prominent. By 2025, the research landscape increasingly incorporated language-specific and technology-driven topics, including EFL learners, public speaking, speaking skills, artificial intelligence, machine learning, and instructional strategies. Overall, the results indicate a clear evolution from general collaborative frameworks toward language-focused, learner-centered, and AI-enhanced collaborative speaking research.

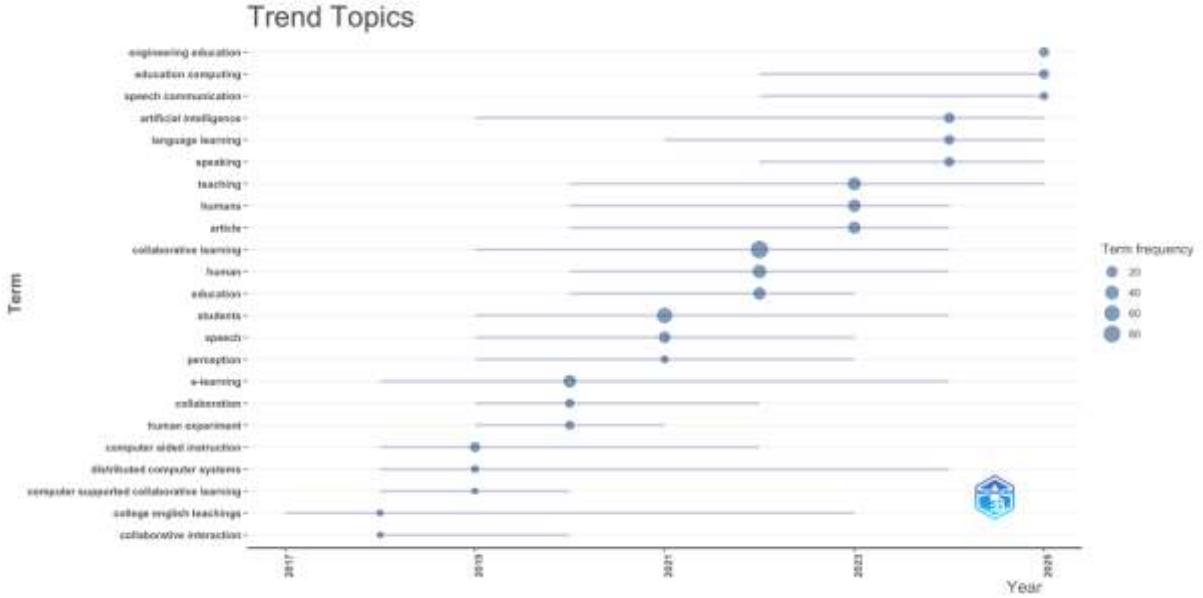

Figure 9 Trend Topics of Collaborative Learning and Speaking Research from 2016 To 2025

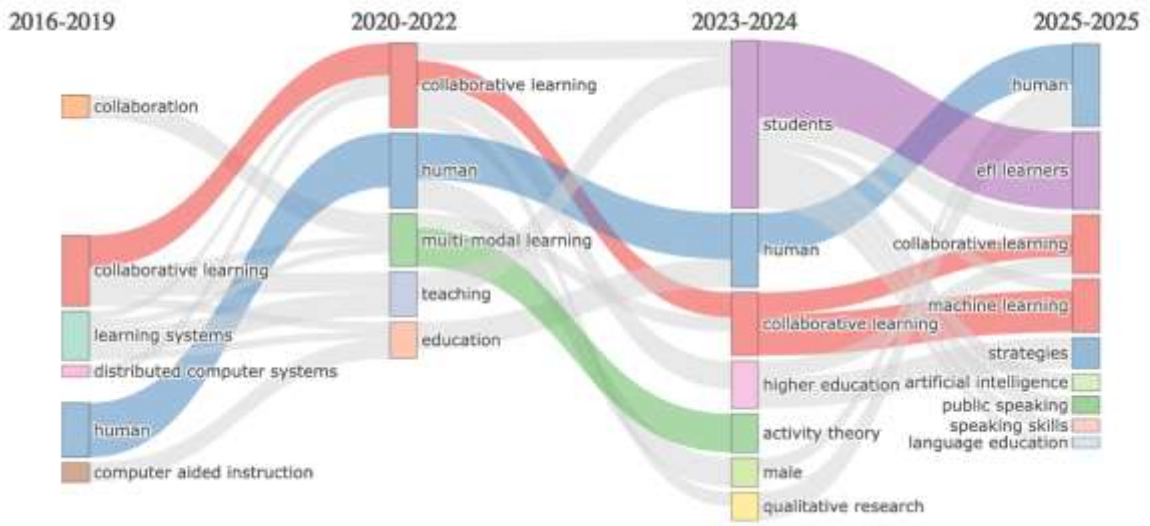

Figure 10 Thematic Evolution of Collaborative Learning and Speaking Research From 2016 To 2025

Discussion

The bibliometric findings indicate that research on collaborative learning in enhancing speaking skills has expanded substantially between 2016 and 2025, with the steepest growth occurring in the final years of the period. This pattern suggests that collaborative learning has increasingly been positioned as a strategic pedagogical response to persistent challenges in speaking instruction, including limited opportunities for authentic oral practice and the need to develop learners' communicative competence through interaction. The surge in publications toward 2024–2025 further implies that the topic has gained stronger visibility and urgency in the wider language education community, particularly as speaking instruction continues to adapt to changing instructional environments.

The publication trend also reflects a shift in pedagogical priorities from conventional classroom collaboration toward more diversified collaborative designs that can support speaking development across different modalities(Ko & Lim, 2022; Puebla et al., 2022; Zhao et al., 2024). While earlier research largely emphasized in-class group work and peer interaction as the primary mechanism for improving oral performance, the growing volume of research over time signals an expanding interest in how collaborative learning can be implemented more systematically and evaluated more rigorously in relation to speaking outcomes(Butarbutar et al., 2023; Cukurova et al., 2020; Ko & Lim, 2022). This development is consistent with the view that speaking is best learned through socially mediated practice, where learners negotiate meaning, receive feedback, and build confidence through repeated interaction (Dua et al., 2023; Kohnke, 2023).

The distribution of productive source titles highlights the interdisciplinary nature of the field. The prominence of outlets associated with language education alongside technology- and computing-oriented conference proceedings suggests that collaborative learning for speaking skills is increasingly examined at the intersection of pedagogy and educational technology. This dual publication pattern implies that research is not only concerned with instructional strategies but also with the technological affordances that enable collaboration, interaction, and speaking practice. At the same time, the concentration of output in a limited number of core sources indicates that scholarly discourse may be shaped by specific communities, which can strengthen coherence but may also limit the integration of perspectives from adjacent fields such as communication studies, teacher education, or educational psychology (Jimenez et al., 2020; Ramalingam et al., 2022).

Authorship results show that the field is characterized by distributed contributions, where many scholars contribute occasionally and a smaller group contributes repeatedly. This pattern suggests that collaborative learning and speaking skills represent a broad research interest rather than a domain dominated by a single research group. The three-fields plot connecting countries, authors, and institutions further demonstrates that scientific production is supported by networks of scholars and organizations rather than isolated efforts. Such networks are important for advancing methodological innovation and for scaling collaborative learning practices across diverse educational contexts.

Country-level findings indicate that research productivity is globally distributed, with particularly strong contributions from China and the United States, followed by other major contributors such as the United Kingdom and Australia. This configuration suggests that both Asian and Anglophone research ecosystems play influential roles in shaping the field. Importantly, contributions from EFL-dominant regions (e.g., parts of Asia and the Middle East) indicate that collaborative learning is often studied as a response to contextual challenges where learners have limited exposure to English outside the classroom and where speaking is widely perceived as difficult to develop through traditional instruction alone. Although international collaboration is visible, the dominance of single-country publications suggests that cross-national comparative studies remain relatively limited, leaving room for more collaborative research that examines how cultural and institutional factors shape collaborative speaking practices.

The thematic structure of the literature, as reflected in keyword frequency and co-occurrence patterns, confirms that "collaborative learning" functions as the conceptual hub of the field, strongly linked to learner-centered and pedagogy-related terms such as students, teaching, and education. Speaking-related terms remain visible, indicating sustained interest in oral communication outcomes, while the appearance of technology-oriented terms such as e-learning, learning systems,

artificial intelligence, and machine learning signals an important transformation in recent years. This indicates that collaborative learning is increasingly framed not only as peer-to-peer interaction but also as interaction mediated by digital platforms and intelligent tools that scaffold speaking practice, feedback, and participation.

The thematic evolution analysis further suggests that the field has moved from early attention to general collaboration and system-oriented themes toward more language-specific, learner-specific, and technology-enhanced concerns. The growing prominence of terms such as EFL learners, speaking skills, public speaking, artificial intelligence, and strategies toward the end of the timeframe implies that researchers are increasingly focusing on how collaborative learning can be tailored to the needs of language learners and supported by emerging technologies. This evolution indicates both maturity and diversification of the field, where collaborative learning is no longer treated as a single method but as an adaptable framework implemented through varied models and technological configurations.

Despite the expansion of research and the emergence of new themes, several gaps remain evident from the mapped landscape. First, much of the literature appears to emphasize effectiveness outcomes without sufficient longitudinal evidence on whether collaborative learning produces sustained improvements in speaking development over time. Second, while technology-enhanced collaboration is increasingly prominent, studies often focus on tool use rather than on interactional quality, group dynamics, participation equity, and the specific mechanisms through which collaboration improves speaking. Third, given the growing interest in AI- and machine learning-supported learning environments, future research should more critically examine pedagogical alignment, teacher readiness, and ethical issues, including transparency and responsible use, to ensure that technological mediation strengthens rather than replaces meaningful communicative practice.

Overall, the findings position collaborative learning as an evolving and increasingly central framework for enhancing speaking skills, shaped by global participation and accelerating technological innovation. The shift toward AI- and digitally mediated collaboration suggests that future research should integrate robust pedagogical theory with deeper analysis of interaction processes, learner experience, and contextual variability. By addressing these gaps, the research community can strengthen both the explanatory power and practical impact of collaborative learning approaches in speaking instruction across diverse educational settings.

D. Conclusions

This bibliometric review of 410 Scopus-indexed documents (2016–2025) shows that research on collaborative learning to enhance speaking skills has grown markedly across the decade, with the strongest acceleration in the most recent years, indicating

increasing scholarly and practical interest in collaborative approaches for developing oral communication. The analysis also shows that publications are concentrated in a small set of influential outlets, with both language-education journals and technology-oriented proceedings serving as key dissemination channels, while authorship is broadly distributed with a limited group of recurring contributors. Country results indicate a globally active field led by a small number of highly productive countries, alongside expanding participation from multiple EFL contexts, and the collaboration patterns suggest that international co-authorship exists but remains less dominant than single-country output. Keyword and thematic mapping reveal that "collaborative learning" forms the central hub of the research landscape and is strongly connected to learner- and pedagogy-focused terms (e.g., students, teaching, education), while recent years show a clearer shift toward technology-mediated collaboration, reflected in the rising presence of terms related to online learning environments and emerging intelligent technologies. Practically, these findings imply that educators and curriculum designers can reasonably treat collaborative learning as a mainstream and adaptable framework for speaking instruction, particularly when supported by purposeful task design and appropriate digital tools that expand opportunities for interaction and oral practice. For future research, the mapped trends indicate the need for more longitudinal and comparative studies across contexts to test the sustainability and transferability of collaborative speaking gains, deeper process-oriented investigations into interaction quality, group dynamics, and equitable participation, and more critical evaluations of technology- and AI-supported collaborative speaking activities to clarify pedagogical mechanisms, implementation conditions, and responsible use.

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