

Research Hotspots and Future Trends of Critical Thinking in English Language Education: A Bibliometric Analysis of WoS and Scopus Database

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Abstract

This review, integrating comparative analysis of WoS and Scopus databases, using VOSviewer and CiteSpace softwares, aims to uncover the current status, research hotspots and future directions on Critical Thinking (CT) research in English language teaching (ELT). An analysis of literature from 2015 to 2024 revealed a significant increase in publications. The findings highlighted Hwang and Heydarnejad as the most frequently influential authors. Prominent 6 academic institutions included Islamic Azad University, Prince Sultan University, the Education University of Hong Kong, University of Malaya, National Taiwan Normal University, and the University of Hong Kong. Additionally, China, Iran, the United States, Malaysia, and Indonesia were 5 leading countries. Keyword co-occurrence analysis showed that English as a foreign language (EFL), English language teaching (ELT), critical Thinking skills, EFL learners and creativity as the most occurred 5 keywords, and cluster and timeline analysis identified the application of educational technology, the innovation and integration of teaching models, the development of higher-order thinking skills, and higher education context as 4 main themes of research hotspots. This review showcased a shift in CT within ELT research from traditional skill development to digital and innovative educational environments.

Keywords: Critical thinking, English language teaching, Bibliometric analysis, VOSviewer, CiteSpace

Introduction

In the digital age, critical thinking (CT) is widely recognized as an essential skill that enables individuals to adapt and contribute in a globalized, technology-driven environment. Within the framework of critical pedagogy, CT is associated with higher-order cognitive processes such as analysis, synthesis, and evaluation, which allow learners to move beyond rote memorization and engage with complex problem-solving tasks (Ennis, 2018). As education systems increasingly emphasize 21st-century competencies, CT has become a central learning outcome across disciplines.

Within this broader educational context, English language teaching (ELT) provides a particularly fertile environment for cultivating CT. Because language learning inherently involves interpreting meaning, negotiating perspectives, and constructing arguments, it naturally aligns with the development of higher-order thinking skills. Through the integrated practice of reading, writing, speaking, and listening, learners are encouraged to analyze texts, evaluate themes, and identify underlying biases (Marwa & Herdi, 2023). These competencies facilitate the interpretation of underlying meanings and the construction of arguments, leading to the synthesis of evidence and the articulation of ideas (Liang & Fung, 2021; Qi et al., 2025). In addition, classroom discussions and communicative tasks require students to justify their viewpoints, apply logical reasoning, and consider multiple perspectives, thereby strengthening both analytical and evaluative capacities (Yuan et al., 2022). In this way, CT not only enhances learners' linguistic competence but also deepens their intellectual engagement and communicative effectiveness.

Despite its significant pedagogical potential, integrating CT into ELT faces numerous challenges. One of the primary obstacles is the traditional focus on rote memorization and standardized testing, which often overshadows the development of higher-order thinking skills (Saifer, 2024). Another challenge is the diverse range of student abilities and backgrounds, which requires a flexible and inclusive approach to teaching CT (Liang & Fung, 2021). Teachers must be adept at scaffolding instruction to meet the needs of all learners, providing support for those who struggle while also challenging those who excel (Liang & Fung, 2021). Additionally, the integration of technology and multimedia resources can be a double-edged sword, while they offer rich opportunities for enhancing CT, they also present the risk of information overload and the potential for misinformation (Hernández, 2024). While some students require substantial support in developing analytical skills, others benefit from more advanced cognitive challenges, placing additional demands on instructional design. Furthermore, although digital technologies and multimedia tools can enrich learning environments and promote CT, they also introduce risks such as cognitive overload and exposure to misinformation (Hernández, 2024). These challenges highlight the complexity of effectively embedding CT within ELT contexts.

Given these opportunities and constraints, research on CT in ELT has expanded in recent years. However, the field still lacks a comprehensive synthesis of its intellectual structure and development trends. Existing studies have provided valuable insights, yet they often focus on limited datasets or single analytical approaches. For example, Arthi and Gandhimathi (2025) examined CT in ELT from 2012 to 2022 using Scopus and Web of Science (WoS) data; however, their analysis relied solely on R-based Biblioshiny tools. While useful for identifying general trends, this approach does not fully capture the complementary strengths of specialized bibliometric visualization tools such as VOSviewer and CiteSpace, which enable more detailed mapping of co-authorship networks, keyword co-occurrence, and thematic evolution. Moreover, their study does not reflect the rapid developments in generative artificial intelligence after 2022, which have significantly reshaped CT-related practices in ELT (Albeih & Rice, 2025).

In addition, no existing study has systematically combined dual-database (WoS and Scopus) analysis with both VOSviewer and CiteSpace to provide a more robust and multi-dimensional perspective on the field. Addressing this gap is particularly important for the

period 2015–2024, which corresponds to rapid advancements in digital education, artificial intelligence, and computational approaches in language learning. A comprehensive bibliometric analysis covering this period can therefore offer a more updated and structured understanding of the field's development.

This bibliometric analysis aims to uncover the current status, research hotspots and future directions on CT research in ELT from 2015 to 2024 by integrating comparative analysis of WoS and Scopus databases and using VOSviewer and CiteSpace softwares.

Based on the research objectives, there are two research questions (RQ):

RQ1: What is the current status of CT Research in ELT including publication trends, the distribution of most influential authors, organizations, and countries?

RQ2: What are the research hotspots and future trends of CT in ELT from 2015 to 2024?

Literature Review

What is critical thinking?

Critical Thinking (CT) is generally defined as the ability to systematically analyze and evaluate information to make reasoned judgments. It involves multiple dimensions, including analysis, evaluation, reasoning, and decision-making. According to Ennis (2015), CT encompassed skills, including analyzing arguments, evaluating positions, and employing problem-solving strategies. Furthermore, the CT framework proposed by Elder (2016) emphasized the importance of problem-oriented learning and reflective thinking in education. Elder (2016) argued that CT is not only about analyzing information but also about reflecting on one's own thinking process.

How is critical thinking integrated in English teaching?

In the field of English language teaching (ELT), the development of CT is widely applied in various areas including language teaching, literary analysis, and intercultural communication (Yuan et al., 2022). Liang and Fung (2021) has shown that CT not only enhances students' language skills but also improves their ability to comprehend texts and make judgments about information. Wang and Newell (2025) argued that, in English language teaching, activities, including debate, critical reading, and writing help students better develop CT. Hanim et al. (2020) emphasized the importance of fostering CT through writing instruction, asserting that writing is not just a practice of language expression but also a training of thought. Moreover, Saifer (2024) stated that educators must navigate the complex task of balancing content coverage with the cultivation of CT abilities, ensuring that students are not only equipped with the necessary linguistic tools but also encouraged to engage with the material in a more analytical and reflective manner.

Method

Scientific knowledge graph in this bibliometric analysis serves as a powerful tool for analyzing knowledge development and uncovering implicit relationships within a specific field (Öztürk et al., 2024). Furthermore, this bibliometric analysis, as a quantitative research method, is an essential approach for exploring scientific data and emerging fields due to its objectivity and extensive applicability in this field of critical thinking (CT) in English language teaching (ELT) (Samsul et al., 2023).

Data Sources

In this study, the search data was updated until November, 2024, and the retrieval was conducted in the WoS Core Collection and Scopus databases. The terms of search query are follows: (“Critical Thinking” OR “CT” OR “higher-order thinking” OR “analytical reasoning” OR “logical thinking” OR “creative thinking” OR “reflective thinking” OR “problem-solving skills” OR “reasoning skills”) AND (“English education” OR “English teaching” OR “English instruction” OR “English learning” OR “TESOL” OR “TEFL” OR “ESL” OR “EFL” OR “English as a second language” OR “English as a foreign language” OR “English class*” OR “English course*” OR “English pedagogy*” OR “language arts education” OR “English language teaching” OR “ELT”). The combination of these terms using Boolean operators ensures both breadth and specificity, allowing for the identification of the most relevant literature at the convergence of these domains. A total of 715 articles retrieved from Wos database and 1,007 relevant articles were retrieved in the Scopus database. These two datasets were imported into VOSviewer and CiteSpace for analysis.

The rationale in this study for choosing a comparative analysis of the WoS and Scopus databases is as follows: Firstly, differences in the scope and focus of these databases can lead to variations in the results of bibliometric analyses, depending on the database used (Gusenbauer, 2022). Scopus includes a larger number of journals and articles compared to WoS (Mongeon & Paul-Hus, 2016). While WoS is renowned for its extensive coverage of articles detailing fundamental research, Scopus offers a broader range, encompassing both fundamental and applied research (Yubo et al., 2023). This distinction highlights the complementary nature of these two databases in capturing diverse dimensions of scholarly output.

Furthermore, we select articles only published between 2015 and 2024 for analysis. When applying the same search query without time restrictions, 880 articles were retrieved from WoS and 1,241 from Scopus. Articles published between 2015 and 2024 accounted for 81.3% of the total in WoS and 81.1% in Scopus. This period saw a significant increase in research on CT in the context of ELT, reflecting the growing scholarly attention to this field in recent 10 years.

Study procedures

The methodological process was conducted using VOSviewer and CiteSpace analysis. Firstly, VOSviewer software version 1.6.20 is used to construct a scientific knowledge graph based on the annual number of publications within the field of CT research in ELT. Additionally, VOSviewer visualized the networks of most influential authors, research organizations, and countries. Through keyword co-occurrence analysis from VOSviewer, the study further identified the core keywords and research directions in the field. Moreover, the CiteSpace software version 6.3.R1 is used to perform timeline analysis, and conduct keyword clusters analysis. It help to illustrate the evolutionary processes of various themes of research hotspots and their changes over time. These visualizations provide systematic support for understanding the current status, key research hotspots, and future trends in the field of CT in ELT.

Results

The trends in annual article publications based on WoS and Scopus

The annual publication trends in research on CT in ELT highlight its evolving prominence as a scholarly focus (Oweis, 2024). As shown in **Figure 1**, from 2015 to 2024, there has been a noticeable and consistent increase in the number of articles published both on WoS and Scopus databases. Firstly, over the past ten years, the annual number of articles meeting the same search criteria in Scopus surpassed that of WoS in most years, with the exceptions of 2015, 2016, and 2019, where Scopus figures were slightly lower than those of WoS. Secondly, despite some fluctuations, research in the field of CT research in ELT continues to grow quickly.

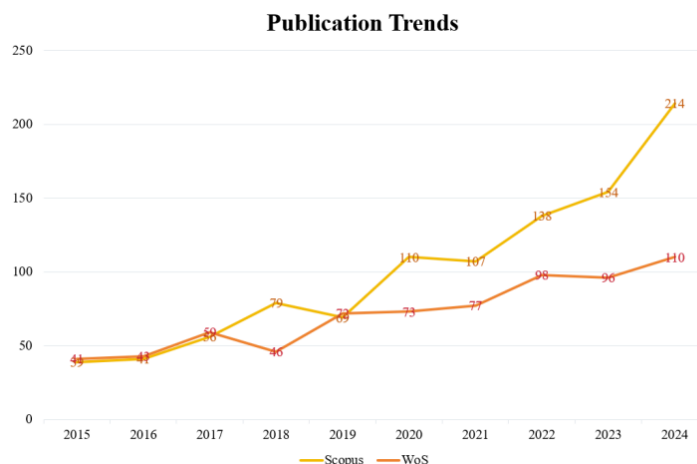


Figure 1. The trends of annual publication articles from 2015 to 2024 in WoS and Scopus

The most influential authors based on WoS and Scopus

This analysis yielded **Figure 2**. In both databases, four of the top five most frequently cited authors overlapped, showing a high degree of consistency in this research domain. However, some differences were observed. In the WoS database, the top five authors were Hwang, Heydarnejad, Farahian, Izadpanah, and Wang, while in the Scopus database, the top five included Heydarnejad, Setyarini, Hwang, Izadpanah, and Yunus, with Wang and Namaziandost also ranking highly. This indicates slight variations in the evaluation of author influence between the two databases. The figures further revealed that Hwang was the most prolific author in the WoS database, with a total of nine publications, while Heydarnejad ranked as the most prolific author in the Scopus database, also with nine publications. In the WoS database, Heydarnejad ranked second, while in the Scopus database, Setyarini and Hwang were tied for second place. Notably, Izadpanah ranked fourth in both databases, demonstrating consistency across platforms. Additionally, Yunus, Wang, and Namaziandost were tied for fifth place in the WoS database, while Wang held fifth place in Scopus, underscoring both similarities and differences in author rankings between the databases. And Farahian, another prominent contributor, was also among the top five prolific authors.

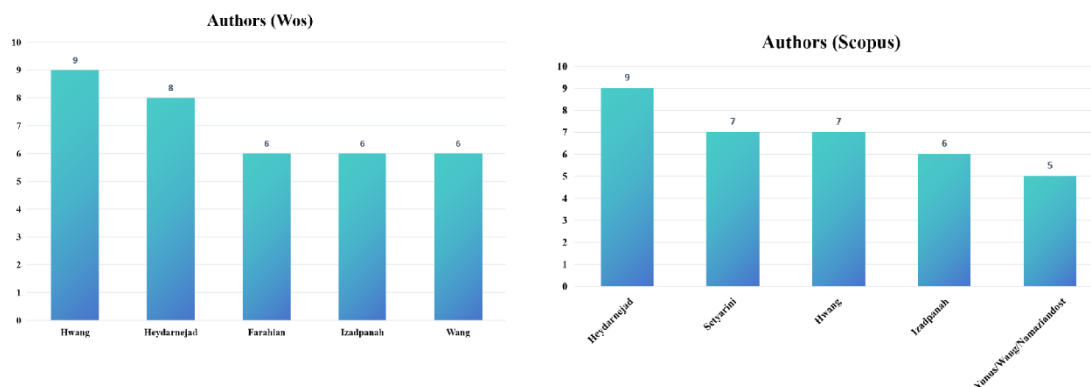


Figure 2. The distribution of authors in WoS and Scopus.

The most influential organizations based on WoS and Scopus

Among the top 10 institutions with the highest publication counts, six organizations “Islamic Azad University, Prince Sattam Bin Abdulaziz University, the Education University of Hong Kong, University of Malaya, National Taiwan Normal University, and the University of Hong Kong” ranked prominently in both databases, indicating a high level of consistency. However, some differences were noted in **Figure 3**. Northeast Normal University, Beijing Normal University, Beijing Foreign Studies University, University of Gonabad, and National Taiwan University of Science and Technology appeared only in the WoS database. In contrast, Universiti Sains Malaysia, Universiti Kebangsaan Malaysia, Sultan Qaboos University, and Universitas Pendidikan Indonesia were exclusive to the Scopus database.

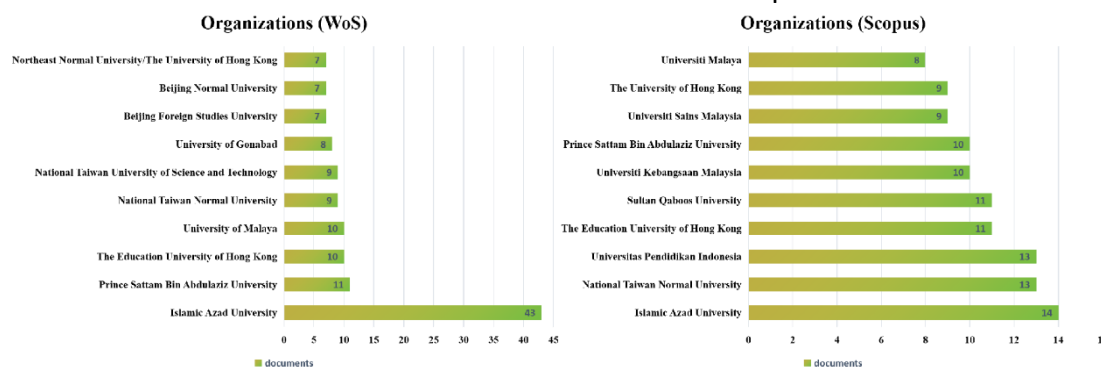


Figure 3. The distribution of organizations in WoS and Scopus

The most influential countries based on WoS and Scopus

Among the top five countries by publication volume, all countries are identical in both databases, reflecting a total consistency (see **Figure 4**). China leads in publication volume across both databases, with a cumulative total of 252 articles in WoS, accounting for 35.2% of the total articles, and 260 articles in Scopus, representing 25.8% of the total. China’s publication output constitutes approximately one-quarter of the total articles in both databases, more than three times that of the second-ranking country, Iran, underscoring China’s significant advantage in academic research and publications. In the WoS database, Iran ranks second with 84 articles, accounting for 11.7% of the total, while in Scopus, it also ranks second with 121 articles, representing 12.0%. In the WoS database, the USA ranks third with 44 articles (6.2%), whereas in Scopus, Indonesia ranks third with 103 articles (10.2%). Comparatively, Indonesia ranks fifth in the WoS database with 39 articles (5.5%), while the USA ranks fifth in Scopus with 60 articles (6.0%). Additionally, Malaysia ranks fourth in the

WoS database with 41 articles, accounting for 5.7% of the total. In the Scopus database, Malaysia also holds a prominent position, ranking fourth with 67 articles (6.7%).

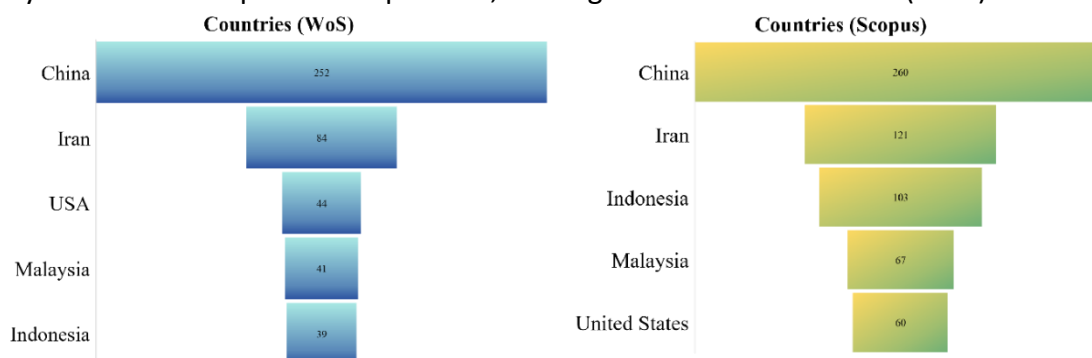


Figure 4. The distribution of countries in WoS and Scopus

The co-occurrence of keywords based on WoS and Scopus

Keywords are crucial indicators in bibliometric research, serving as a concise summary of the content of an article (Chen et al., 2024). Analyzing the changes in keyword frequencies, we can track the evolution of research hotspots over time. This method visualizes the data through circles and connecting lines, where the size of the node represents the frequency of a keyword's occurrence, with larger circles indicating higher co-occurrence frequency. The thickness of the connecting lines reflects the strength of the relationship between keywords, with thicker lines indicating stronger associations. This type of analysis allows to quantify and visualize the evolution of themes related to CT research in ELT, providing an insightful perspective on the development trends.

When conducting analysis using VOSviewer software, selecting “Keyword Co-occurrence” as the network type and adjusting the threshold to filter out keywords with lower frequencies helps in generating a more meaningful and visual network map. In this process, when multiple keywords are semantically equivalent, merging them provides a more accurate reflection of the total frequency of the concept within the research. “EFL” and “English as a Foreign Language (EFL)”, “EFL students” and “EFL learners”, as well as “English Language Teaching”, “English Teaching”, and “ELT”, although they are presented in different forms, refer to the same or highly similar concepts. If these keywords are counted separately, their frequencies may become fragmented, leading to an underestimation of the actual importance of these concepts. Therefore, by merging such synonyms, a more comprehensive representation of the focus in CT research within ELT can be achieved. Additionally, some terms with broader or ambiguous meanings, such as “systematic review”, are excluded during the filtering process to enhance the precision of the analysis.

The analysis results, as shown in **Table 1**, display the top 20 keywords based on co-occurrence frequency of two databases, revealing the distribution of keywords in the most frequently cited papers on CT in ELT. Comparing **Figure 5** and **Figure 6**, some interesting insights emerge. Among the top 20 keywords from both databases, 15 keywords appear in both, indicating a high level of consistency. These 15 keywords include: CT, English as a foreign language, English language teaching, CT skills, EFL learners, creativity, higher education, reflective thinking, language learning, motivation, college English, reading comprehension, project-based learning, EFL teachers, higher-order thinking skills, and academic writing. These high-frequency keywords reflect the central research themes within the field of CT in ELT.

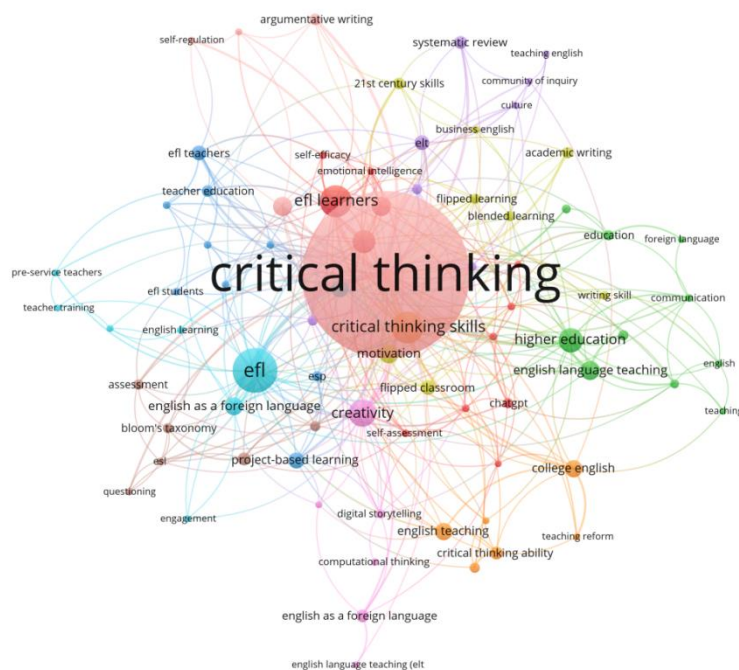


Figure 5. Keyword co-occurrence analysis of CT in ELT in WoS

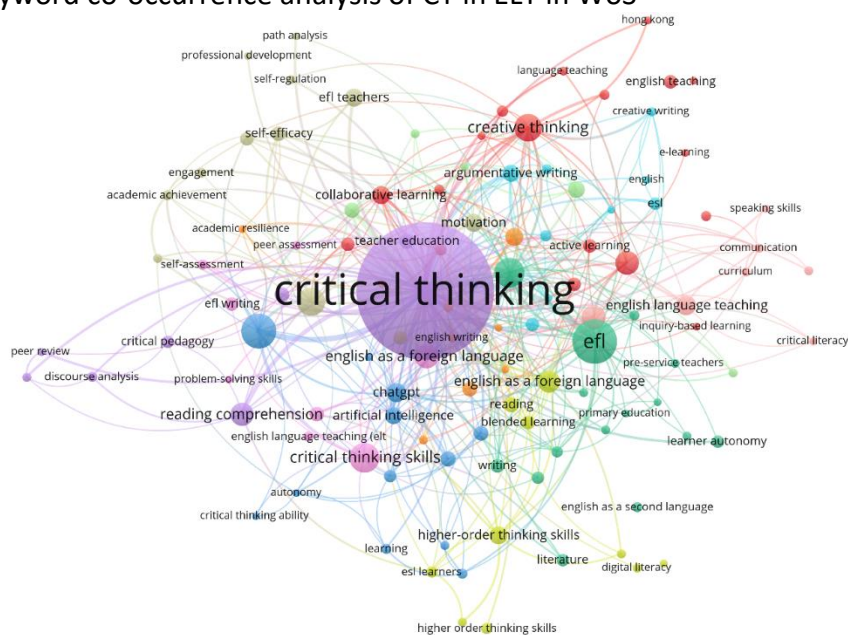


Figure 6. Keyword co-occurrence analysis of CT in ELT in Scopus

The network maps generated by VOSviewer provide a more intuitive visualization of both the frequency and the strength of relationships between keywords. Keywords “Critical Thinking”, “English as a foreign language”, “English language teaching”, “Critical Thinking skills”, “EFL learners”, and “creativity” appear frequently in the network maps. Moreover, the thickness of the connecting lines between these keywords signifies that there is a very close relationship between “Critical Thinking” and terms like “English as a foreign language”, “English language teaching”, “Critical Thinking skills”, “EFL learners”, and “creativity”. This highlights the strong thematic interconnections within CT research in ELT. The visual representation of these co-occurrence patterns underscores the ongoing importance of these

concepts in the field and provides a clearer understanding of the current academic trends in this area.

Overall, we concluded that “English as a foreign language”, “English language teaching”, “Critical Thinking skills”, “EFL learners” and “Creativity” have become research hotspots in the field of CT in ELT. In addition, the emergence of “ChatGPT” and “artificial intelligence” reflected the focus on the potential of technology-enhanced learning to drive CT in ELT.

Table 1

The top 20 keywords of CT in ELT in WoS and Scopus

WoS			Scopus		
No.	Keywords	Occurrences	No.	Keywords	Occurrences
1	Critical Thinking	190	1	Critical Thinking	258
2	English as a foreign language	67	2	English as a foreign language	96
3	English language teaching	42	3	EFL learners	52
4	Critical Thinking skills	29	4	creativity	30
5	EFL learners	29	5	Critical Thinking skills	30
6	creativity	24	6	reflective thinking	28
7	higher education	21	7	higher education	23
8	reflective thinking	20	8	language learning	22
9	creative thinking	16	9	reading comprehension	21
10	language learning	16	10	English language teaching	17
11	motivation	16	11	ChatGPT	16
12	college English	14	12	collaborative learning	15
13	reading comprehension	14	13	EFL teachers	15
14	project-based learning	13	14	higher-order thinking skills	15
15	EFL teachers	12	15	motivation	15
16	flipped classroom	12	16	project-based learning	15
17	Critical Thinking ability	10	17	argumentative writing	14
18	higher-order thinking skills	10	18	artificial intelligence	14
19	21st century skills	9	19	academic writing	12
20	academic writing	9	20	education	12

The keywords cluster analysis and time line analysis based on WoS and Scopus

Keyword cluster graphs are generated through co-occurrence analysis of keywords, followed by clustering functions to group them. Index terms are then used to annotate each cluster. The timeline view feature in CiteSpace provides a visual representation of the relationships among keywords, clusters, and their temporal spans (Zheng et al., 2020). In the timeline view, the vertical axis represents time, while the horizontal axis represents clusters (Murugesan et al., 2017). Each node signifies the first appearance of a keyword, with the size of the node reflecting the level of research attention and the number of related publications (Murugesan et al., 2017). Through cluster analysis, the core thematic networks and their interconnections in CT within the field of ELT can be revealed. The cluster analysis in the timeline view categorizes co-occurring keywords into distinct research thematic groups, with each group representing relatively independent research directions within specific timeframes, thus illustrating the temporal evolution of research hotspots.

Using the period from 2015 to 2024 as the study timeframe and setting the time slices to one year, the timeline visualization maps (see Figures 11 and 12) illustrate the annual research trends of CT in the field of ELT. The keyword cluster network from WoS contains 278 nodes and 799 links, while the Scopus keyword cluster network includes 289 nodes and 907 links. By employing the Log-Likelihood Ratio (LLR) method to label clusters, the distinct characteristics of each cluster are highlighted more clearly (Wang & Lu, 2020).

The modularity and silhouette metrics for **Figure 7** and **Figure 8** are as follows: Modularity $Q = 0.4837$ (WoS), Weighted Mean Silhouette $S = 0.7655$ (WoS), and Modularity $Q = 0.5996$ (Scopus), Weighted Mean Silhouette $S = 0.89$ (Scopus). These values indicate that the clustering structures are both significant and convincing. Specifically, a Modularity Q value greater than 0.3 signifies clear clustering structures, while a Weighted Mean Silhouette S value above 0.5 suggests that the clustering results are reasonable and stable (Yuan & Lai, 2023).

As observed in figures the distribution of keyword clusters is relatively dispersed, showing that research on CT in ELT exhibits a degree of thematic diversification. The average publication year of each cluster reflects the mean publication year of its member articles. We present the clusters (see **Appendix A**), including their attributes: Cluster ID, Cluster size, Silhouette value, LLR label, and the mean year of publication. According to the results, the emerging average publication years for clusters, specifically from 2017 to 2020 in Scopus and from 2017 to 2021 in WoS, showed a growing academic interest and focus on CT within ELT during these periods. These timeframes indicated that research in this field has seen notable advancements and contributions in recent years. Such findings highlight an active engagement of scholars with contemporary issues and evolving methodologies related to CT in ELT. The slightly broader timeframe in WoS (2017 to 2021) might reflect its wider scope of indexed journals and interdisciplinary coverage, capturing a more diverse range of research trends compared to Scopus. Next, research hotspots of keywords are analysed as follows:

Firstly, one research hotspot is application of educational technology. In the Scopus database, the hotspot keywords “big data”, “e-learning”, “computational thinking” and “educational robots” are closely associated, indicating an increasing emphasis in modern education research and practice on fostering students’ thinking abilities through digital educational tools.

Secondly, another research hotspot is innovation and integration of teaching models. The hotspot keywords “blended learning” and “flipped classroom” in the WoS database, along with Cluster #8 “Blended Learning” in WoS, “interdisciplinary activities” in Scopus, and Cluster #6 “Exploratory Talk” in Scopus, demonstrate the significant role diverse teaching models play in CT research within ELT.

Additionally, the third research hotspot is development of higher-order thinking skills (HOTS). In both the WoS and Scopus databases, research hotspots, including CT, higher-order thinking skills, 21st century Skills, creative thinking, collaborative learning, communication, sophisticated thinking, computational thinking, and reflective thinking, alongside Cluster #0 “Critical Thinking”, Cluster #1 “Reflective Thinking”, Cluster #3 “Reflective Practice”, Cluster #4 “Creative Thinking”, Cluster #5 “Critical Thinking Skills”, Cluster #6 “Oral Communication”

in WoS, and Cluster #2 Higher-order Thinking Skills, Cluster #3 Critical Thinking in Scopus, highlighted that higher-order thinking skills are central themes in contemporary educational research and practice of CT field.

Finally, the fourth research hotspot is higher education context. In the WoS and Scopus databases, the keyword “academic writing,” along with Cluster #2 “Higher Education” in WoS and Cluster #0 “College English” in Scopus, highlights research trends centered on fostering CT within the context of higher education. These clusters underscore the significance of cultivating CT in educational environments specific to higher education settings.

Overall, the analysis of keyword clusters in CT research within ELT highlights four key hotspots and future trends, including the application of educational technology, the innovation and integration of teaching models, the development of higher-order thinking skills, and higher education context. Although the research in this field appears relatively fragmented, these hotspots reflect its diversity and integrative nature. Future research could further explore the intersections of these key themes, particularly the integration of educational technology with the cultivation of higher-order thinking skills, thereby providing stronger theoretical support and innovative approaches for educational practice in the field of CT in ELT.

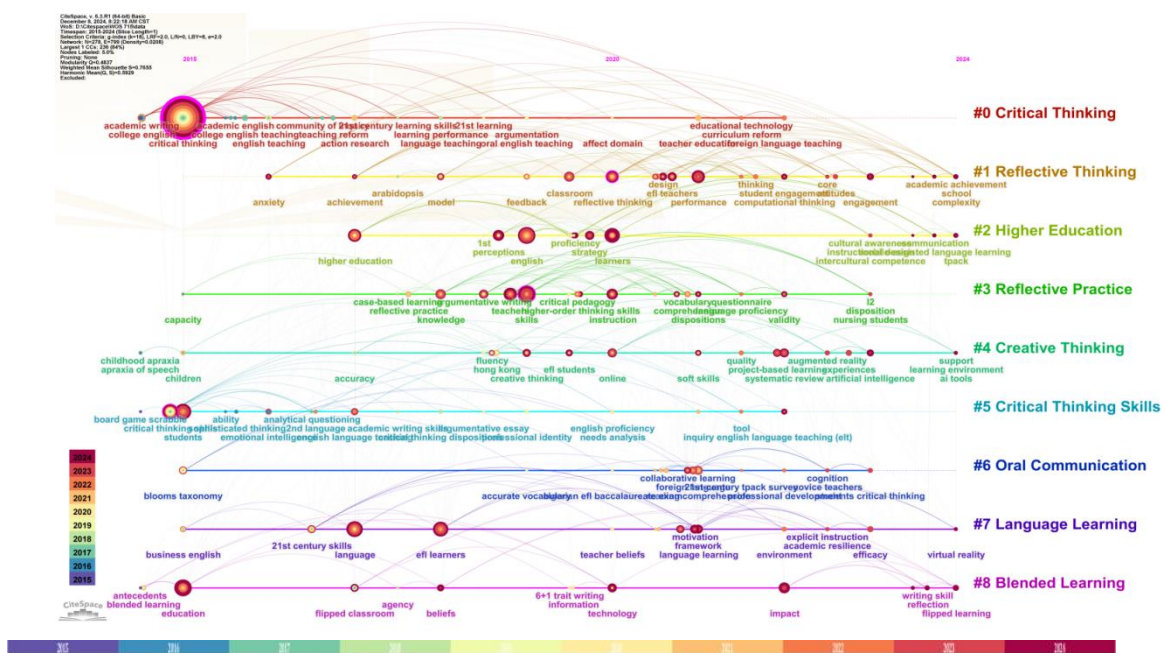


Figure 7. Year-wise trends for CT research in ELT in WoS

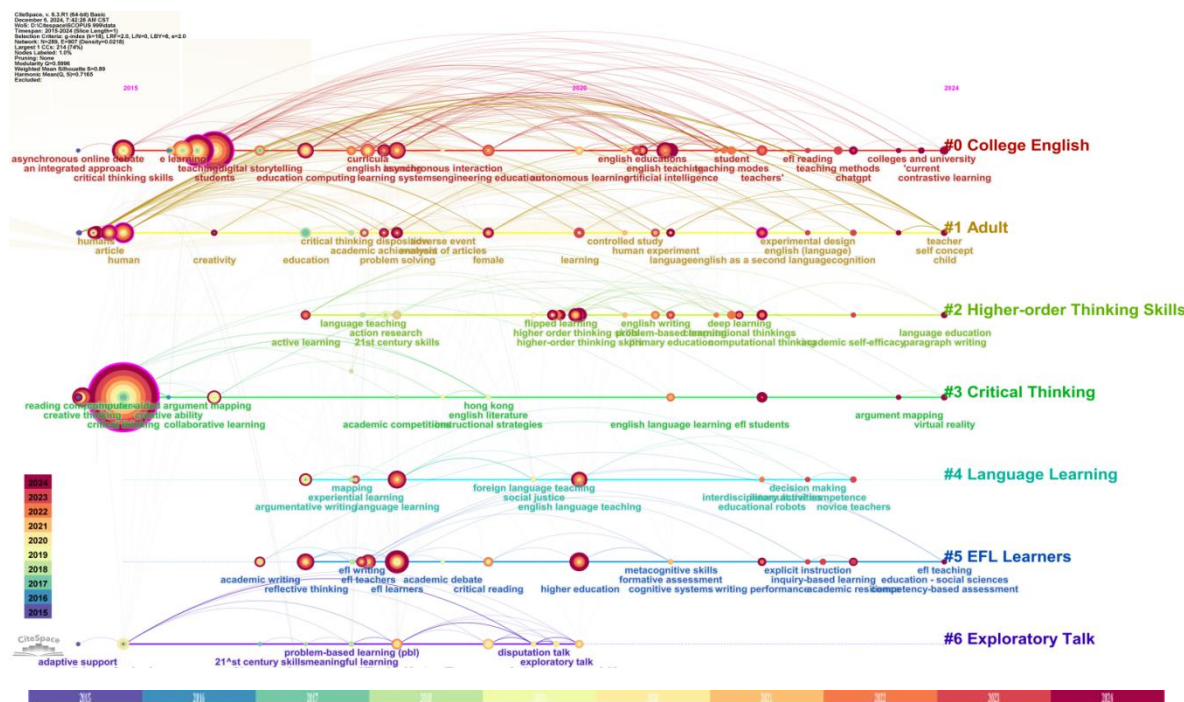


Figure 8. Year-wise trends for CT research in ELT in Scopus

Discussion

RQ1: What is the current status of CT Research in ELT including publication trends, the distribution of most influential authors, organizations, and countries?

This study of CT in ELT has gained substantial traction in recent 10 years, reflecting its growing importance in fostering essential 21st-century skills. From 2015 to 2024, there has been a noticeable and consistent increase in the number of articles published on CT in ELT both on WoS and Scopus databases. This trend reflects a growing recognition of the importance of integrating CT skills into language learning as a response to the demands of the 21st century. Such growth trajectories are commonly observed in many expanding research domains and are likely driven by a combination of policies, societal demands, and technological advancements (Öztürk et al., 2024).

Moreover, Hwang emerges as the most prolific author in the WoS database, while Heydarnejad holds the same distinction in the Scopus database. This positions both scholars as some of the most influential figures in the field of CT in ELT.

Furthermore, Islamic Azad University, Prince Sultan University, the Education University of Hong Kong, University of Malaya, National Taiwan Normal University, and the University of Hong Kong all rank highly in both WoS and Scopus databases, reflecting their significant international influence in the field of CT research. From the perspective of distribution of organizations, research on CT in ELT extends beyond specific countries or regions, with many universities from the Middle East, Southeast Asia, and East Asia making notable contributions, demonstrating the global diversity of this field of CT in ELT.

In addition, China's publication volume in the two databases accounts for approximately one-quarter of the total, exceeding that of the second-ranking country, Iran, by more than threefold. Accordingly, China demonstrates a significant advantage in academic research and

publication within this field. This remarkable disparity underscores China's substantial resource investment and scholarly contributions to advancing CT in ELT research. It also reflects the Chinese academic community's strong emphasis on CT in ELT studies and its growing influence on the international academic stage.

RQ2: What are the research hotspots and future trends of CT in ELT from 2015 to 2024?

Through the keywords co-occurrence analysis, the prominence of "English as a foreign language" (EFL) and "English language teaching" (ELT) as foundational research domains have been widely recognized in the context of globalization and internationalization. These fields aim not only to enhance the linguistic competence of learners from non-English-speaking countries but also to foster cultural exchange and intercultural communication skills. Furthermore, the integration of "Critical Thinking skills", "EFL learners" and "Creativity" reflects the demands of contemporary educational reform. CT has emerged as a core competency for 21st-century learners, and its incorporation into ELT is viewed as a vital approach to enhancing learners' overall competencies. In addition, the emergence of "ChatGPT" and "artificial intelligence" highlights the growing trend of technology-enhanced learning. The application of these tools in ELT introduces new possibilities, covering fostering CT and providing personalized learning experiences (Mukhamedov, 2024). The development of AI technologies in education not only improves teaching efficiency but also offers innovative modes of interaction for both educators and learners.

Furthermore, as for the four themes of research hotspots, educational technology, innovative teaching models, higher-order thinking skills, and higher education, all highlight the importance of linking CT with modern teaching reform. A clear similarity is the use of digital tools to make learning more flexible and to support CT, as shown in the spread of e-learning and blended learning (Ali, 2020; Kumar et al., 2021). Higher-order thinking and higher education studies also both stress the need to build skills like analysis, evaluation, and creativity, which are vital for solving complex problems in today's digital world (Álvarez-Huerta et al., 2023). Still, there are differences in focus. Research on technology often looks at platforms and systems (Liu & Wang, 2024), while studies on teaching models focus more on classroom methods such as flipped learning and exploratory talk (Yusuf & Taiye, 2021). Work on higher-order thinking examines overall cognitive growth (Tikhonova & Kudinova, 2015), but higher education research is more specific, looking at academic writing, decision-making, and how students are prepared for future challenges (Li & Wan, 2022).

Therefore, future research directions are expected to focus more on the integration of online educational tools and CT in ELT. Researchers can explore how digital tools can be leveraged to enhance learners' CT skills, and employing data-driven learning platforms or AI-assisted tutoring systems to enable personalized CT instruction in ELT.

Conclusion

This study employs bibliometric methods, utilizing VOSviewer and CiteSpace software to construct a series of scientific knowledge graphs on Critical thinking (CT) research in English language teaching (ELT) from 2015 to 2024, based on data retrieved from both WoS and Scopus databases. Leveraging the visualization features of knowledge mapping, the study examines the current status, research hotspots, and future trends in CT research in ELT

through metrics including annual publication trends, distributions of authors, organizations and countries, as well as keyword co-occurrence, cluster, and timeline analysis.

Under identical search queries, discrepancies were observed in the number of retrieved articles from WoS and Scopus: 715 articles were identified in WoS, while 1007 articles were retrieved from Scopus. A comparative analysis of the results from the two databases showed similarities and differences in CT research in ELT. The analysis of literature published between 2015 and 2024 revealed a notable upward trend in the number of publications. Influential contributors, Hwang and Heydarnejad, have emerged as 2 key authors. And 6 leading academic institutions, including Islamic Azad University, Prince Sultan University, the Education University of Hong Kong, University of Malaya, National Taiwan Normal University, and the University of Hong Kong, have made significant contributions as evidenced in both databases. Geographically, countries like China, Iran, the United States, Malaysia, and Indonesia were at the forefront organizations. Keyword co-occurrence analysis identified terms “English as a foreign language (EFL)”, “English language teaching (ELT)”, “Critical Thinking skills,” “EFL learners”, and “Creativity” as most 5 occurred keywords. Cluster analysis further highlighted the 4 research hotspots, including the integration of educational technology, innovative teaching models, the cultivation of higher-order thinking skills, and the context of higher education.

Overall, this study makes three novel contributions to the field of social sciences, particularly in language education research. First, it provides a comprehensive and updated bibliometric analysis of critical thinking (CT) in English language teaching (ELT) by integrating data from both Web of Science and Scopus, thereby enhancing the reliability and coverage of the findings. Second, unlike previous studies that rely on a single analytical tool, this study combines VOSviewer and CiteSpace to offer a more multi-dimensional and systematic mapping of the field, including collaboration networks, thematic clusters, and temporal evolution. Third, by focusing on the period from 2015 to 2024, the study captures recent developments shaped by digitalization and emerging technologies, offering timely insights into evolving research trends. This study contributes to the broader social sciences by advancing the methodological rigor of bibliometric research and providing a structured knowledge base to inform future research and pedagogical practices in CT and ELT.

Although this study mitigates potential biases associated with relying on a single database by conducting parallel analyses of two databases (WoS and Scopus), it is important to note that the findings are limited by the scope of these two databases and the restricted time span (2015–2024). As a result, the analysis does not encompass all possible data sources. Future research could consider integrating additional databases and conducting cross-database analyses over a longer timeframe to yield more comprehensive results in the field of CT research in ELT.

Implications

The findings of this bibliometric study offer four important implications for researchers, educators, and policymakers in the field of English language teaching (ELT), particularly in relation to the integration and development of critical thinking (CT).

Firstly, from a pedagogical perspective, the identification of key research hotspots, including the integration of educational technology, innovative teaching models, and higher-order thinking skills, highlights the need for instructional practices that move beyond traditional teacher-centered approaches. English language educators are encouraged to design learner-centered tasks that promote analysis, evaluation, and argumentation. In addition, given the growing role of digital tools, teachers should purposefully integrate technologies like AI-assisted writing platforms and online discussion forums to create interactive environments that stimulate critical engagement rather than passive learning.

Furthermore, the study carries significant implications for curriculum design. The prominence of keywords such as “EFL learners,” “creativity,” and “critical thinking skills” suggests that CT should be explicitly embedded as a core learning outcome within ELT curricula. Curriculum developers should ensure that CT is not treated as an implicit by-product of language learning but as a structured component supported by clear learning objectives, assessment criteria, and scaffolded activities. Moreover, differentiated instructional strategies are necessary to address learner differences, enabling both lower- and higher-proficiency students to progressively develop their cognitive and linguistic abilities.

Additionally, from a research perspective, this study demonstrates the value of combining multiple bibliometric tools (VOSviewer and CiteSpace) and data sources (WoS and Scopus) to generate a more comprehensive understanding of the field. Future researchers are encouraged to adopt multi-method and cross-database approaches to enhance the reliability and depth of bibliometric analyses.

Finally, the findings have institutional and policy-level implications. The concentration of research output in specific countries and institutions suggests uneven global participation in CT-related ELT research. Policymakers and educational institutions, particularly in underrepresented regions, should invest in research capacity building, international collaboration, and professional development programs to promote broader engagement in this field. In addition, teacher training programs should incorporate CT-oriented pedagogies and digital literacy components to better prepare educators for evolving classroom demands.

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