BIBLIOMETRIC ANALYSIS OF AI-DRIVEN TOOLS IN ENGLISH LANGUAGE TEACHING

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ABSTRACT

This study conducts a bibliometric analysis to examine the utilization of AI-driven tools in English Language Teaching (ELT) from 2014 to 2024. Articles were gathered using the Publish or Perish application, which extracts data from the Google Scholar database. The search employed the keyword "AI tool in ELT" to capture relevant literature comprehensively. The collected data, including publication titles, authors, publication years, source titles, and citation counts, were organized and analyzed using Microsoft Excel and VOSviewer. The analysis identified key trends, influential authors, and active institutions in this field. Results indicated significant contributions from authors such as B.L. Moorhouse and L. Kohnke, with notable publications in journals like Educational Technology & Society and Education Sciences. The findings underscore the growing impact of AI in ELT, revealing critical insights into research developments and highlighting gaps for future exploration. This study provides valuable information for educators, researchers, and policymakers, aiming to enhance the integration of AI technologies in English language education.

Keywords: *AI-driven tools, bibliometric analysis, ELT*

1.1. Introduction

Artificial Intelligence (AI) has increasingly become an integral part of modern education, offering innovative solutions to enhance teaching and learning processes. The integration of AI in education spans various domains, from personalized learning experiences to administrative efficiencies. According to Chen, Chen, and Lin (2020), AI has been extensively adopted and utilized in various forms within educational institutions. Initially, AI appeared as computer and computer-related technologies, evolving into web-based and online intelligent education systems. This progression includes the use of embedded computer systems, humanoid robots, and web-based chatbots, which can independently or collaboratively perform instructional duties. These platforms enable instructors to execute administrative functions, such as reviewing and grading assignments more effectively and efficiently (Ahmad et al., 2022; Hooda et al., 2022). Furthermore, AI's adaptability and learning capabilities allow for the customization and personalization of curricula and content, enhancing student engagement and learning quality (Castro et al., 2024; Davis et al., 2024; Rane, 2024). This technological

advancement has revolutionized traditional educational methodologies, presenting new opportunities and challenges for educators and learners alike. The rise of AI technologies has prompted significant shifts in educational practices, emphasizing data-driven insights to improve pedagogical outcomes.

Within the field of English Language Teaching (ELT), AI-driven tools have demonstrated significant potential in transforming language acquisition and instruction. These tools, ranging from intelligent tutoring systems to automated assessment platforms, have been designed to support both teachers and students in achieving more effective and efficient learning outcomes. The application of AI in ELT not only aids in language proficiency development but also facilitates customized learning paths tailored to individual student needs (Alshumaimeri & Alshememry, 2024; Anis & Scholar, 2023). Such advancements underscore the role of AI in enhancing the overall quality and accessibility of language education. AI's capacity to mediate and supplement instructional processes has been systematically reviewed by Xu and Ouyang (2022), who propose that AI's roles in education can be categorized into three main areas: as a new subject, as a direct mediator, and as a supplementary assistant. This categorization helps to understand the diverse influences of AI applications on instructional and learning dynamics, further validating AI's transformative impact on ELT.

The adoption of AI-driven tools in ELT has witnessed substantial growth over the past decade. Numerous studies have highlighted the benefits of these tools, such as enhanced student engagement, improved feedback mechanisms, and the ability to analyze large datasets for educational insights(Adiguzel et al., 2023; Alam & Mohanty, 2023; Hooda et al., 2022; Rane, 2024). Despite these advantages, there is a need for a comprehensive analysis of the trends and impact of AI-driven tools in ELT, which can provide valuable insights for future research and practice. This rapid expansion calls for a critical examination of how these technologies are reshaping the landscape of language education and what it means for educators and learners moving forward. The increasing integration of AI in ELT necessitates a nuanced understanding of its potential and challenges, ensuring that its implementation is both effective and ethically sound.

While there is a growing body of literature on the application of AI in ELT, a systematic bibliometric analysis of these tools remains limited(Ma et al., 2024). This study aims to fill this gap by conducting a thorough bibliometric analysis of AI-driven

tools in ELT. The objective is to identify key trends, influential publications, and emerging research areas within this field. By doing so, this research seeks to contribute to the existing knowledge base and guide future investigations on the integration of AI in ELT. Ultimately, this study aspires to provide a foundational understanding of the current landscape of AI-driven tools in ELT and to highlight areas for further exploration and development. Through this comprehensive analysis, we aim to offer valuable insights that can inform policy, practice, and further research in the dynamic intersection of AI and ELT.

1.2. Research questions

Despite the growing integration of artificial intelligence (AI) in various educational domains, there is limited comprehensive understanding of the specific trends and developments in AI-driven tools for English Language Teaching (ELT) over the past decade. Identifying the key research trends from 2014 to 2024 is crucial for recognizing the progress, challenges, and emerging areas of interest within this field. Understanding these trends can provide valuable insights for educators, researchers, and policymakers to enhance the effectiveness and adoption of AI technologies in ELT. Therefore, the author formulates a research question as follow: “What are the research trends in AI-driven tools for English Language Teaching (ELT) from 2014 to 2024?” This study aims to fill this gap by conducting a detailed bibliometric analysis, thereby contributing to the broader discourse on AI's impact on language education.

2. METHOD

This study employs a bibliometric analysis to investigate the use of AI-driven tools in English Language Teaching (ELT) from 2014 to 2024. The data collection was conducted using the Publish or Perish application, which extracts relevant articles from the Google Scholar database. The search was performed using the keyword "AI tool in ELT" to ensure a comprehensive retrieval of literature related to the research topic.

The collected articles were systematically analyzed to identify trends, influential authors, and active institutions in this field. The data extracted included publication titles, authors, publication years, source titles, and citation counts. This dataset was then

exported to Microsoft Excel for preliminary data cleaning and organization. Excel was used to categorize the data, identify duplicates, and perform initial statistical analyses.

Subsequently, the cleaned dataset was imported into VOSviewer, a software tool used for constructing and visualizing bibliometric networks. VOSviewer facilitated the creation of co-authorship, co-citation, and keyword co-occurrence maps, which helped in visualizing the relationships and collaborations among researchers, as well as the key themes and trends in the literature. This combination of Excel and VOSviewer allowed for a detailed and comprehensive analysis of the bibliometric data, providing valuable insights into the development and impact of AI-driven tools in ELT over the specified period.

By employing these methods, the study aims to offer a thorough understanding of the current research landscape, highlight significant contributions, and identify areas that require further exploration. This methodological approach ensures a robust analysis, leveraging the strengths of both bibliometric tools and qualitative evaluation.

3.FINDINGS AND DISCUSSION

3.1. Finding

The results section of this study presents a comprehensive bibliometric analysis of AI-driven tools in English Language Teaching (ELT). Utilizing a systematic approach, we have examined a wide array of scholarly articles, conference papers, and other relevant publications to identify key trends, influential works, and emerging research areas in this rapidly evolving field. The findings, analyzed using Excel and VOSviewer, encompass a detailed overview of the top five authors, publishers, and journals contributing to this domain.

The trend in publication and citation of artificial intelligence in English language Teaching

Table 1 reveals that the most prolific authors in the field of AI-driven tools in English Language Teaching (ELT) include BL Moorhouse, who has contributed to seven publications, making him the leading author in this domain. Following closely is L Kohnke with six publications. R Godwin-Jones and H Yang have each contributed to five publications, while D Zou has four publications to his name. This data highlights the

significant contributions of these researchers in advancing the integration and understanding of AI in ELT, reflecting their pivotal roles in shaping current research trends and developments within this field.

Table 1. *Top 5 Authors*

No	Authors	Frequent
1	BL Moorhouse	7
2	L Kohnke	6
3	R Godwin- Jones	5
4	H Yang	5
5	D Zou	4

Building on the contributions of leading authors in the field, table 2 shows the analysis of publishers further illustrates the landscape of AI-driven tools in English Language Teaching (ELT). Springer emerges as the most prominent publisher, with a total of 35 articles, followed closely by Taylor & Francis with 31 articles. Researchgate.net, with 28 articles, also plays a significant role in disseminating research findings. Additionally, both Eric and Wiley Online Library have contributed 18 articles each, underscoring their importance in providing access to scholarly work related to AI in ELT. Collectively, these publishers facilitate the exchange of knowledge and advancements in the integration of AI within language education, reinforcing the pivotal contributions of key researchers in this dynamic field.

Table 2. *Top 5 Publisher*

No	Publisher	Article
1	Springer	35
2	Taylor & Francis	31
3	Researchgate.net	28
4	Eric	18
5	Wiley Online Library	18

In addition to identifying leading authors and publishers, table 3 shows the analysis of journals further delineates the key platforms where research on AI-driven tools in English Language Teaching (ELT) is being published. Educational Technology & Society stands out as the foremost journal, with 12 articles dedicated to this area. Following closely is Education Sciences, with 11 articles contributing to the discourse. Computers & Education has published 10 articles, showcasing its significant role in exploring the intersection of technology and education. The British Journal of

Educational Technology and the Journal of Educational Computing Research have contributed 9 and 8 articles, respectively. These journals serve as crucial venues for the dissemination of research, reflecting the diverse and interdisciplinary nature of AI applications in ELT. Collectively, they highlight the breadth of scholarly engagement with AI technologies, reinforcing the contributions of key authors and the support of major publishers in advancing this field.

Table 3. *Top 5 Journal*

No	Journal	Article
1	Educational Technology & Society	12
2	Education Sciences	11
3	Computers & Education	10
4	British Journal of Educational Technology	9
5	Journal of Educational Computing Research	8

Based on table 5, the citation data of the most influential articles provides further insight into the impact of AI-driven research in English Language Teaching (ELT). The most cited work is "Two decades of artificial intelligence in education: past, present, and future" by X Chen, D Zou, H Xie, G Cheng, and C Liu, published in 2022, which has garnered 325 citations. This seminal paper offers a comprehensive review of AI's evolution in education and its future directions. Following closely is S Grassini's 2023 article, "Shaping the future of education: exploring the potential of AI tools," with 303 citations, highlighting the forward-looking perspective on AI's role in education. L Oktaviani and B Mandasari's 2020 study, "Powtoon: A digital medium to optimize students' engagement and learning outcomes," has received 271 citations, showcasing the practical application of digital tools to enhance learning. The 2021 article by Z Sun and M Anbarasan, "Design of online intelligent English teaching system based on AI technology," with 264 citations, underscores the technological advancements in online English teaching systems. Lastly, S Pokrivcakova's 2019 work, "Preparing teachers for the application of AI-powered educational tools in the classroom," with 260 citations, emphasizes the importance of teacher preparedness in integrating AI technologies. Collectively, these highly cited articles underscore the pivotal contributions to the field and the growing scholarly interest in AI applications within ELT.

Table 4. *Top 5 Article Citation*

No	Year	Author	Title	Citation
1	2022	X Chen, D Zou, H Xie, G Cheng, C Liu	Two decades of artificial intelligence in education: past, present, and future	325
2	2023	S Grassini	Shaping the future of education: exploring the potential of AI tools	303
3	2020	L Oktaviani, B Mandasari	Powtoon: A digital medium to optimize students' engagement and learning outcomes	271
4	2021	Z Sun, M Anbarasan	Design of online intelligent English teaching system based on AI technology	264
5	2019	S Pokrivcakova	Preparing teachers for the application of AI-powered educational tools in the classroom	260

Based on the previously outlined data, the next step is to examine the research trends regarding AI in ELT over the past decade. The analysis of publication trends from 2014 to 2024 indicates a significant growth in the number of studies focused on AI-driven tools in English Language Teaching (ELT). From 2014 to 2018, the number of publications remained relatively low and stable, reflecting the nascent stage of AI integration in ELT during this period. However, beginning in 2019, there was a noticeable increase in research activity, which continued to rise steadily each year. In 2022, the field experienced a substantial surge, with the number of publications reaching a peak of over 175. This dramatic increase underscores the heightened interest and rapid advancements in AI technologies within the educational sector. The trend slightly declined in 2023 but still remained significantly higher than in previous years, indicating sustained research momentum. By 2024, while there was a slight drop in publications, the overall trend suggests a continued strong interest in AI applications in ELT. This upward trajectory over the last decade highlights the growing recognition of AI's potential to transform language teaching and learning, driving extensive academic inquiry and practical exploration in this dynamic field.

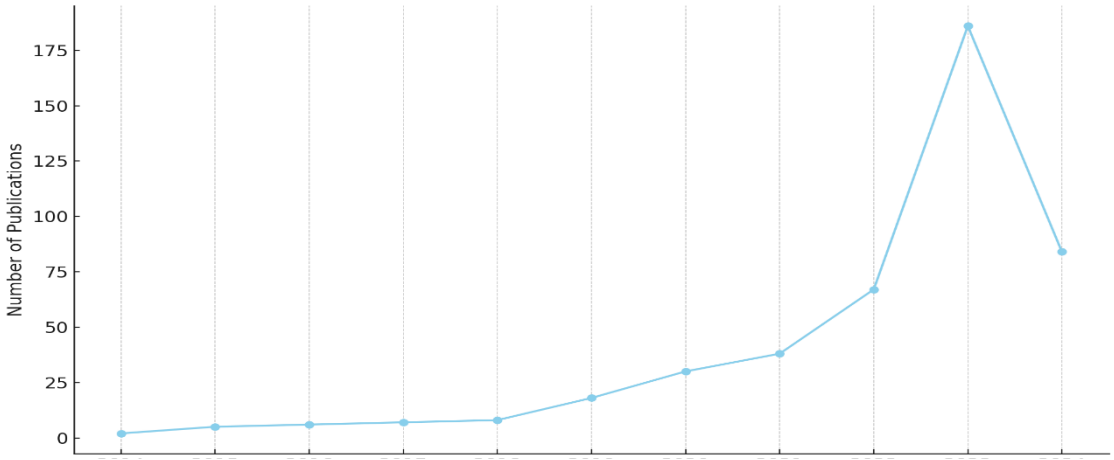

Figure 1. *Number of Publication in the last 10 years*

The Focus of Research to Artificial Intelligence in English Language Teaching

The keyword analysis conducted using VOSviewer provides a visual representation of the prominent themes and their interconnections within the research on AI-driven tools in English Language Teaching (ELT). The network visualization reveals several distinct clusters, each represented by different colors, indicating thematic concentrations and relationships among the keywords (figure 2)

The first is the green cluster, it includes keywords such as "artificial intelligence," "tool," "ELT," "English language teaching," and "English language." This cluster represents the core focus of research on AI tools specifically tailored for ELT. It highlights the primary areas of interest and study within this domain, showcasing the intersection of AI technologies and their application in teaching English. The next, red cluster features keywords like "AI tool," "ChatGPT," "systematic review," "impact," "higher education," "role," and "challenge." This cluster indicates a significant research focus on specific AI tools, such as ChatGPT, and their implications, challenges, and impacts within higher education. The inclusion of "systematic review" suggests a methodological approach prevalent in this cluster, emphasizing comprehensive evaluations of existing research.

Another cluster is the yellow cluster, it includes keywords such as "student" and "perception," reflecting studies centered on the role of AI tools from the students' perspective. This cluster emphasizes the perceptions, experiences, and roles of students in the context of AI-enhanced ELT, underlining the importance of understanding learner-

centric viewpoints. The last is the blue cluster that encompasses keywords like "language learning" and "language," which focus on the broader aspects of language acquisition and learning facilitated by AI tools. This cluster suggests a broader educational context where AI applications are not limited to English but extend to language learning in general.

The interconnectedness of these clusters highlights the multidisciplinary nature of AI-driven ELT research, where technological advancements, educational impacts, and learner experiences are interwoven. This comprehensive keyword analysis provides valuable insights into the predominant themes and research directions, offering a clearer understanding of the current landscape and potential future pathways in the integration of AI within English language education.

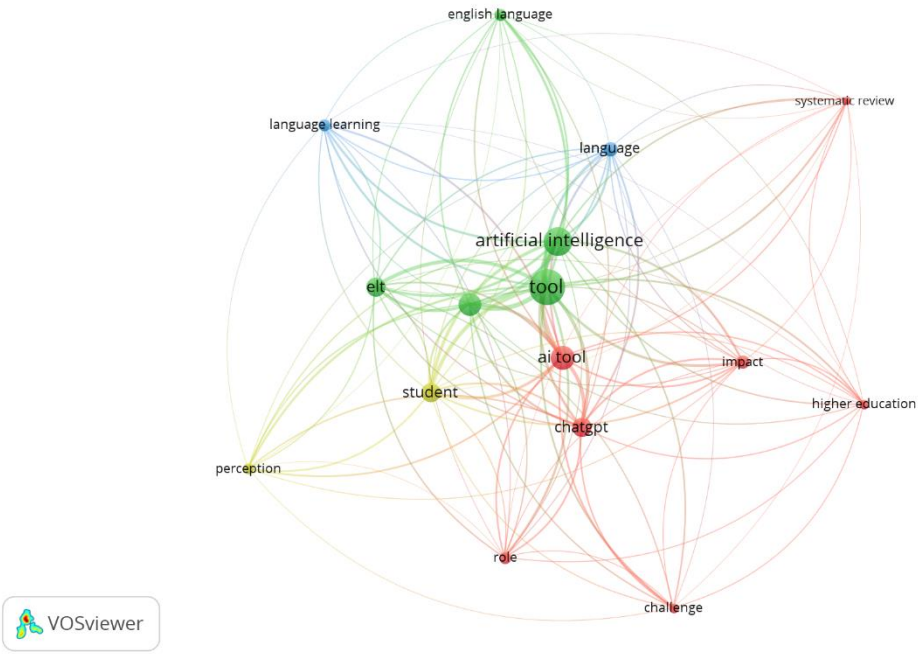

Figure 2. *Keyword Co-occurrence*

The keyword trend analysis visualized through VOSviewer provides an insightful overview of the evolution of research topics in AI-driven tools for English Language Teaching (ELT) over the years. The color gradient from blue to yellow in the visualization represents the timeline from 2022 to 2023, highlighting how research interests have shifted during this period. (Figure 3)

In early 2022, the research focus predominantly revolved around fundamental concepts and core areas, as indicated by the blue hues in the visualization. Keywords such as "artificial intelligence," "tool," "ELT," "English language teaching," and "English

language" were central themes, reflecting a strong emphasis on exploring the basic applications and implications of AI in the context of ELT. This period marked the foundation for understanding how AI technologies could be integrated into language teaching.

As the year progressed towards mid to late 2022, the research focus began to diversify, incorporating more specific and applied aspects of AI in ELT. This shift is depicted by the green to yellow hues. Keywords such as "AI tool," "ChatGPT," "systematic review," and "impact" started gaining prominence, indicating an increased interest in evaluating the effectiveness and challenges of specific AI tools like ChatGPT. The methodological approaches, such as systematic reviews, also became more prevalent, suggesting a growing need for comprehensive assessments of existing literature.

By 2023, the research landscape further evolved, with the yellow hues highlighting the latest trends. Keywords like "higher education," "role," "challenge," and "perception" became more central, indicating a focus on the broader implications and contextual challenges of AI integration in educational settings. The interest in higher education suggests a shift towards understanding how AI tools can be effectively implemented at more advanced educational levels. Additionally, the exploration of roles and perceptions reflects an increased emphasis on the human factors involved in AI adoption, such as the roles of students and teachers and their perceptions of AI tools.

This timeline analysis underscores a dynamic and evolving research landscape in AI-driven ELT. Initially focused on foundational aspects, the research has progressively moved towards more nuanced and applied topics, addressing the practicalities, impacts, and perceptions associated with AI technologies in language education. This trend highlights the field's maturation and the growing complexity of research questions being addressed.

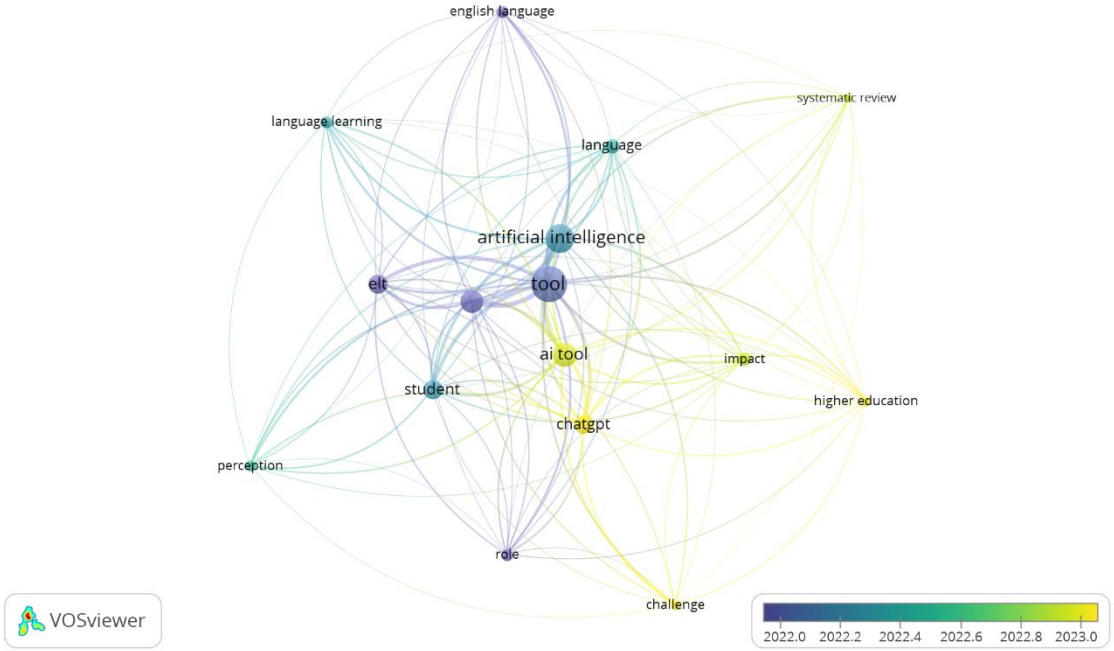

Figure 3. *Overlay Visualization*

3.2. Discussion

Based on the findings above, the bibliometric analysis of AI-driven tools in English language teaching provides a comprehensive overview of the most influential authors, publishers, and journals in this field. The data shows that BL Moorhouse leads the domain with seven publications, followed by L Kohnke, R Godwin-Jones, H Yang, and D Zou. Their research has significantly contributed to studies on the use of AI tools in English language learning, influencing current research trends. For instance, Moorhouse and Kohnke's research indicates that the use of Generative AI (GenAI) is expected to have a substantial impact on the role of teachers. Teachers believe that GenAI can assist in curriculum development, instructional processes, and learning assessments. Consequently, it is crucial to adopt a critical attitude towards the use of AI in the learning process(Kohnke et al., n.d.). Another finding highlights that the rapid technological advancements can lead to psychological stress among teachers, known as technostress, due to the swift evolution and complexity of technological features. This stress can adversely affect teacher performance, especially if compounded by low technological proficiency(Kohnke et al., n.d.).

Additionally, the research identifies several prominent publishers contributing significantly to AI research in education, particularly in ELT. Springer ranks first as the leading publisher of articles in this domain, demonstrating substantial interest in promoting AI applications in language education. It is followed by Eric and Wiley Online Library, both of which have also made significant contributions. These publishers play a critical role in the widespread acceptance and recognition of AI-based learning tools. Their contributions provide valuable opportunities for academics and researchers to disseminate knowledge and integrate technology into the field of education, especially in English language education.

Moreover, the citation data provides insight into the impact of key research articles. The most cited work, "Two decades of artificial intelligence in education: past, present, and future" by X Chen et al., has garnered 325 citations, highlighting its seminal role in the field. The research indicates that the use of AI in education has significantly increased over the past two decades, with major topics including Intelligent Tutoring Systems (ITS), Natural Language Processing (NLP), and Educational Data Mining (EDM). Although AI offers great potential for personalized learning and timely interventions, challenges related to data privacy and instructor acceptance still need to be addressed to optimize the benefits of this technology in teaching and learning(X. Chen et al., 2022). Other highly cited articles include studies by S Grassini, L Oktaviani, B Mandasari, Z Sun, M Anbarasan, and S Pokrivcakova, which collectively emphasize the diverse applications and significant impacts of AI tools in ELT. These citations reflect the growing scholarly interest and recognition of AI's transformative potential in language education, driving both academic inquiry and practical implementations. The consistent increase in publications and citations over the past decade further underscores the sustained momentum and evolving focus of AI research in ELT, marking it as a critical area of study and innovation.

Based on the keyword analysis of several previous studies, it was found that each color in the clusters represents a specific pattern, each providing insight into the prevalent research themes among academics. The green cluster focuses on core concepts that represent the fundamental intersection between AI technology and its application in English language teaching. This cluster emphasizes the primary areas of interest and foundational studies that form the basis for understanding how AI can be integrated into

language education(Alshumaimeri & ..., 2023; Zainurrahman & Rodliyah, 2024). In contrast, the red cluster reflects concentrated efforts to evaluate specific AI tools and their implications within higher education environments. Additionally, the student perspective on the use of AI is represented in the yellow cluster. This aligns with several studies conducted to review student perceptions of AI usage, highlighting both the benefits and shortcomings (Nova & Utami, 2018; Rahim et al., 2023; Wijaya, 2022). Conducting research in the form of a systematic literature review underscores the need for comprehensive evaluations of the effectiveness and challenges of AI (Wang et al., 2024). Moreover, the scope of AI studies has expanded beyond just English language teaching to encompass language learning in general, as indicated by the blue cluster.

As the research evolved from early to late 2022, there was a noticeable diversification in focus. Early studies, marked by blue hues, were primarily centered on fundamental concepts, laying the groundwork for AI applications in ELT. As the year progressed, the focus shifted to more specific and applied aspects, highlighted by green to yellow hues in the keyword trend analysis. By 2023, the research landscape further matured, with yellow hues indicating an increased emphasis on broader implications and human factors such as "higher education," "role," "challenge," and "perception." This shift suggests a growing interest in understanding how AI tools can be effectively implemented at advanced educational levels and the perceptions of both students and teachers regarding these technologies (Bannister et al., 2023; Tayan et al., 2024; Woithe & Filipec, 2023). This dynamic progression from foundational studies to nuanced, applied research illustrates the field's maturation and the increasing complexity of questions being addressed, highlighting the ongoing evolution and refinement of AI applications in ELT.

Overall, the bibliometric analysis underscores the profound impact of AI-driven tools in English language teaching. The significant contributions of leading authors, influential publishers, and widely cited research articles demonstrate the growing importance of AI in this field. As research continues to evolve, it is clear that AI has the potential to revolutionize language education. However, it is essential to address challenges related to data privacy and instructor acceptance to fully realize the benefits of AI in teaching and learning. The expanding scope of AI studies, including its application in broader language learning contexts, highlights the ongoing evolution and the critical role of comprehensive, systematic research in guiding future developments.

4. CONCLUSIONS

4.1. Conclusion

The bibliometric analysis of AI-driven tools in English language teaching (ELT) provides a comprehensive overview of research trends from 2014 to 2024. The findings reveal that BL Moorhouse, L Kohnke, R Godwin-Jones, H Yang, and D Zou are the most influential authors, significantly contributing to the understanding and application of AI in ELT. Major publishers like Springer, Eric, and Wiley Online Library play pivotal roles in disseminating this research. This analysis underscores the substantial impact of AI on ELT, emphasizing the importance of addressing data privacy and instructor acceptance challenges to optimize AI's benefits in teaching and learning. The expanding scope of AI studies beyond English language teaching to general language learning indicates a broader educational impact and the critical need for systematic research to guide future developments.

4.2. Suggestions

While this study provides valuable insights into the research trends of AI in ELT, it is not without limitations. The analysis is based on available bibliometric data, which may not capture all relevant publications or emerging trends accurately. Additionally, the focus on high-impact journals and prominent authors might overlook contributions from lesser-known researchers and publications. Future research should aim to include a broader range of sources and consider qualitative analyses to complement the quantitative findings. It is also recommended that future studies explore the practical implications of AI tools in diverse educational contexts and address the ethical considerations surrounding their use. By doing so, researchers can provide more nuanced insights and support the development of effective, ethical AI applications in language education.

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