

A Visualization Analysis of Research on AI-Enabled English Learning Based on CiteSpace

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Abstract: Taking 200 foreign articles on AI-enabled English learning from the Web of Science Core Collection database published between 2015 and 2025 as research samples, this study adopts CiteSpace visualization software to conduct a systematic visual analysis from the dimensions of annual publication volume statistics, keyword co-occurrence, keyword burst detection, keyword clustering analysis and so forth. The results reveal that the overall development of this field presents a trend of initial stagnant growth followed by explosive expansion. Driven by the emergence of generative artificial intelligence since 2022, the annual publication output has grown exponentially. A comprehensive research system has been constructed centering on generative AI, English language learning, and human-robot co-learning. Furthermore, research frontiers have gradually shifted toward practical teaching implementation, learner psychological intervention, and intrinsic studies of second language acquisition. Among them, learner language anxiety and second language acquisition remain persistent hotspots at present. By systematically sorting out the developmental trajectory and overall research landscape of the field, this study identifies existing research gaps, so as to provide references for subsequent academic research and teaching practice in AI-enabled English learning.

Keywords: AI-enabled English Learning, Citespace, Generative AI, Second Language Acquisition.

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1. Introduction

With the rapid development of large language models and generative AI technologies, artificial intelligence has gradually penetrated into the field of English learning and has become a research hotspot in the interdisciplinary study of second language acquisition and educational technology. Against the wave of global intelligent education, artificial intelligence has become a major auxiliary tool for English learning, with distinct advantages in innovating teaching methods, designing personalized learning paths, and improving intelligent feedback. Meanwhile, significant progress has also been made in understanding learners' psychological characteristics and providing corresponding support.

At present, research outcomes in this field are diverse and the volume of relevant literature is continuously increasing. While this provides abundant theoretical sources for the academic community,

it also poses challenges for scholars in integrating research findings when analyzing the overall trends. We cannot help but wonder: What is the overall research landscape and development law of AI-enabled English learning? What are the characteristics of the evolution of research frontiers and future directions in this field? To systematically clarify the international research context, accurately grasp cutting-edge trends, and provide scientific references for foreign language teaching practice and academic research, this study presents a comprehensive overview of the field's development trends, distribution of research forces, core themes, and evolutionary paths of frontiers through quantitative statistics and visual analysis of relevant literature from 2015 to 2025. This study aims to sort out effective application scenarios and methods of AI-enabled English learning for learners, helping them scientifically plan personalized learning paths and improve learning efficiency. Meanwhile, it offers innovative and practical



references for frontline foreign language teachers' intelligent teaching practices and college foreign language curriculum reform.

2. Data and Methods

2.1 Data sources

All literature data in this study are derived from the Web of Science Core Collection, an internationally authoritative academic database. To accurately focus on the research theme, the study sets the search keywords as "artificial intelligence" and "English learning", with a search time span of 2015-2025, fully covering the complete research cycle of the field from its germination to rapid development. After initial screening, non-academic papers, conference report and off-topic literatures are excluded through a combination of manual verification and redundancy filtering, and finally 200 high-quality English literatures are obtained as the basic dataset for visual analysis, ensuring the scientificity and reliability of the samples.

2.2 Data analysis

This paper employs bibliometric methods and uses CiteSpace 6.1.R6 software to systematically sort out and visually analyze the collected data. By adopting the core functional modules of this software, a comprehensive exploration of research achievements in the relevant academic field is conducted, specifically reflected in the following aspects: analyzing the annual number of published papers to understand the development trend of research scale; mapping the collaboration networks of authors and institutions to identify the mechanisms and characteristics of collaborative innovation; constructing a co-occurrence matrix with keywords to establish the knowledge system structure of research themes; grouping according to keyword co-occurrence patterns to determine the main discussion points and their relationships; tracking the evolution process of research frontiers through time series analysis; identifying new research hotspots with burst words; and clarifying their connections with existing research.

3. Research Results

3.1 Analysis of Publication Trend

From 2015 to 2025, the number of academic papers in the field of AI-enabled English learning exhibits distinct phased evolutionary characteristics, which can be divided into three stages: dormant accumulation, slow growth, and explosive growth.

According to Figure 1, the period 2015–2020 represents the dormant accumulation stage, with the annual number of publications remaining at a low level. Only a small number of relevant studies (1–3 papers per year) were published from 2015 to 2019, and a slight increase was not seen until 2020, though the volume still stayed low. In this stage, early artificial intelligence technologies mostly adopted traditional machine learning frameworks and lacked support from large-scale practical application scenarios. Meanwhile, the low penetration rate of large models led to the failure to form a sound interdisciplinary research ecosystem. The period 2020-2023 shows a slow growth. Approximately 8 papers were cited in 2021 and around 24 in 2022. It can be observed that emerging technologies represented by intelligent tutoring systems and automatic speech recognition have been gradually penetrating the education sector. Research perspectives have also shifted from single-type technical theories to practical applications integrating technology and instruction in teaching.

An explosive growth stage began in 2023. Driven by new generative AI such as ChatGPT, large language models have been applied to various English learning scenarios. Against the backdrop of globalization, the demand for digital transformation in foreign language education has intensified, resulting in an explosive increase in the number of research papers in this field.

At present, AI-based English learning has become one of the key research directions in foreign language education. Its future development trends and social benefits warrant continuous attention and research.

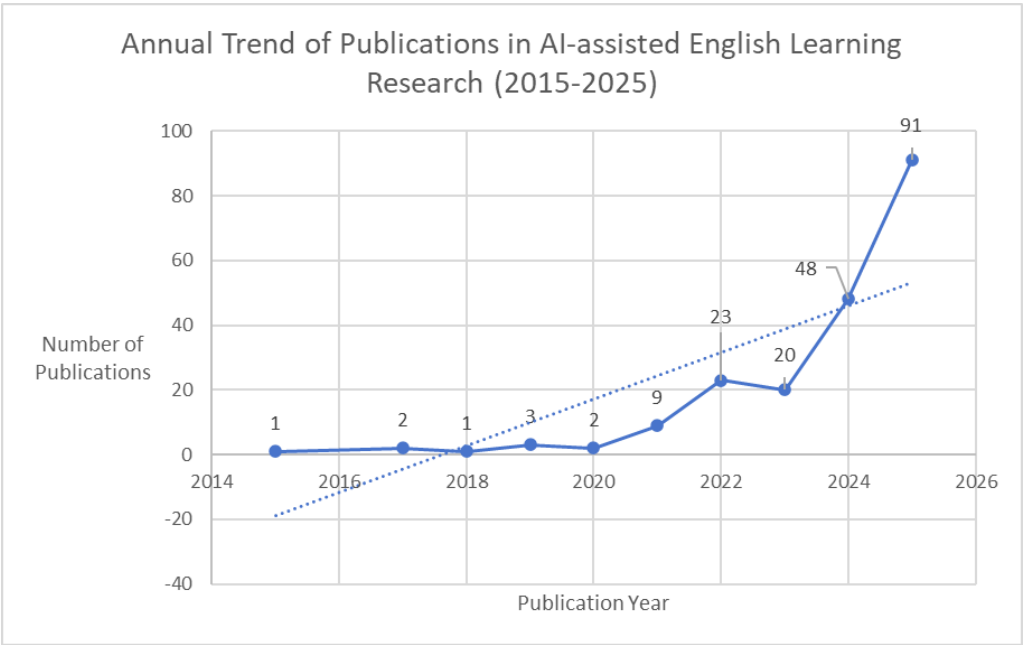


Figure1 Annual publication trend in AI-enabled English learning research (2015-2025)

3.2 Analysis of Research Institution Network

Global research strength is highly concentrated in universities in Hong Kong, Macao and Taiwan of China. The Chinese University of Hong Kong, the Education University of Hong Kong, and the Hong Kong Polytechnic University serve as the global core hubs in this field. Mainland Chinese institutions and East Asian universities from Taiwan, Japan and South Korea constitute the secondary research bases, while European and American overseas universities show low participation and limited publication output.

In terms of the cooperation pattern, institutions within the same region feature prominent clustering and close collaboration, and the academic community in Hong Kong, Macao and Taiwan maintains strong internal connections. The global transnational and intercontinental cooperation network is extremely fragmented, with scarce international academic exchanges and joint research, reflecting insufficient openness in overall cooperation. Mainland universities have not yet entered the global core research circle, which represents a field for future expansion.

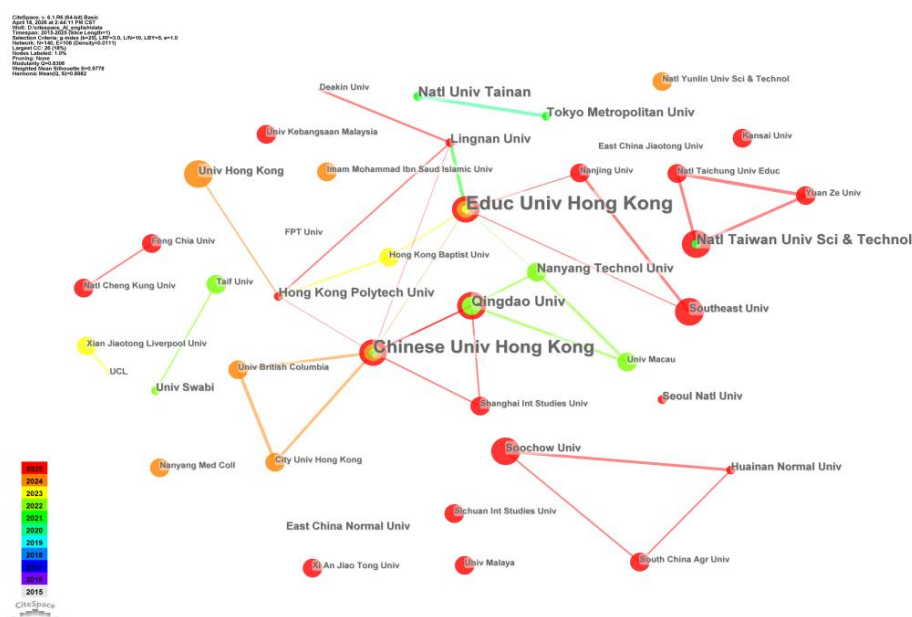


Figure2 Atlas of cooperation networks of institutions

3.3 Analysis of Authors Cooperation Network

3.3.1 Overall analysis of all authors

According to Figure 3, the overall scholar collaboration network in this domain shows prominent characteristics: highly concentrated core clusters, extremely discrete peripheral nodes, insufficient cross-team interaction, and geographically solidified research forces.

Firstly, node colors reflect publication years. The dense red and orange nodes show that most active, high-output authors are emerging researchers in the past five years, in line with the

explosive growth of publications. Node size indicates publication volume, with core scholars including Liu Guangxiang Leon, Lin Chi-Jen, Lee Chang-Shing, Wang Mei-Hui, Hwang Gwo-Jen. Nevertheless, most nodes are small and isolated, with sparse connections and many peripheral scholars publishing independently.

Secondly, clear boundaries exist among collaborative clusters, forming several fragmented small groups with dense internal links but few cross-team connections, leading to low openness of the network.

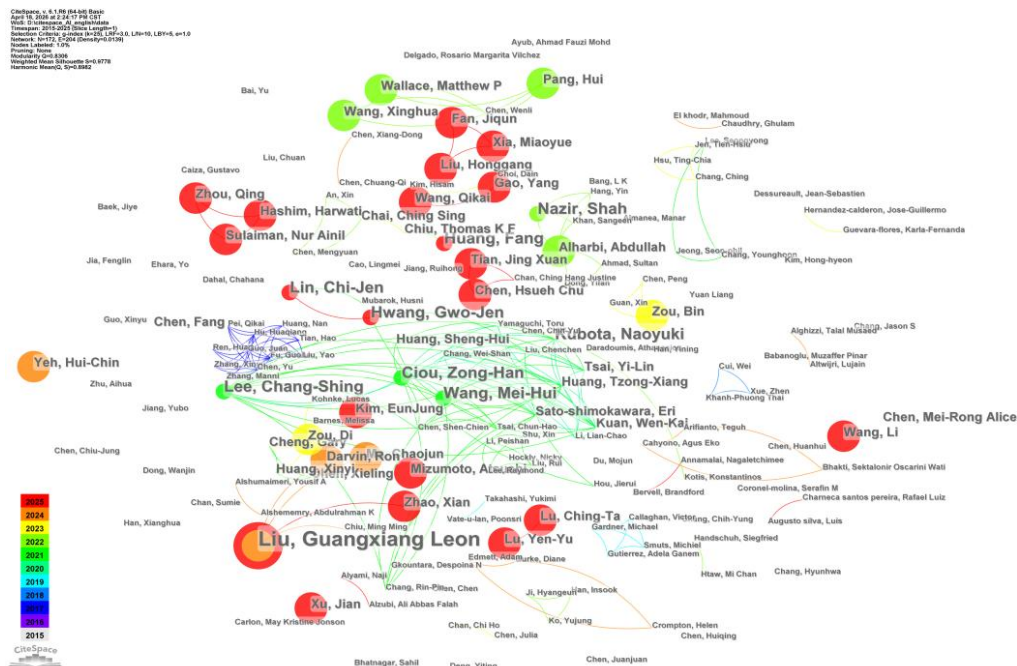


Figure3 Overall author map of AI-enabled English learning

3.3.2 High-frequency and high-yield core author community

A targeted analysis was conducted on the core highly productive author cluster with the densest connections and most stable relationships in Figure 3. Accordingly, Figure 4 is derived. As the most structurally intact and closely cooperating academic team in Figure 3, this core community is centered on pivotal nodes including Lee, Chang-Shing, Ciou, Zong-Han, and Wang, Mei-Hui, radiating connections to frequently collaborating scholars such as Huang Sheng-Hui, Kubota Naoyuki, and Huang Tzong-Xiang. The intricate and high-density internal links reflect long-term stable cooperation and strong research continuity within the group, establishing it as a fundamental core research camp in the field of AI-enabled English learning.

However, this core cluster still presents obvious limitations.

On the one hand, it maintains only weak single-line connections with a small number of top scholars such as Lin, Chi-Jen and Hwang, Gwo-Jen outside the cluster, while remaining completely isolated from most other author groups, thus failing to drive peripheral research forces toward global interaction. On the other hand, despite mature internal collaboration, the cluster has not yet produced iconic leading scholars who can guide the entire field, nor authoritative core figures capable of coordinating multiple teams and integrating research resources across regions.

Overall, only closed, small-scale in-depth collaborations exist in this field. Highly productive scholars conduct research merely within their fixed teams, resulting in a lack of cross-team, cross-regional and cross-cultural academic exchanges and cooperation. The academic community of the field has not yet achieved large-scale integration.

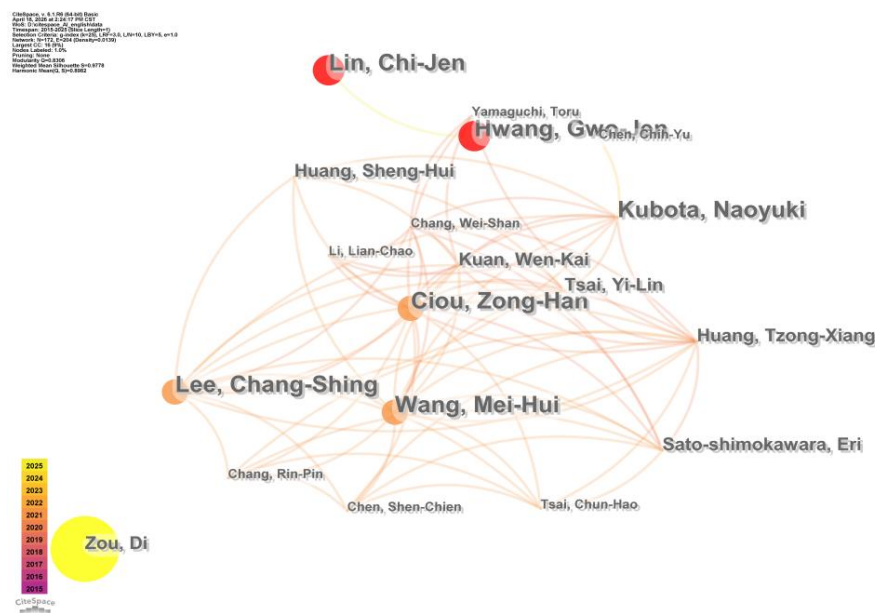


Figure4 High-frequency cooperation map of authors

3.4 Keywords Co-occurrence Analysis

3.4.1 Diverse technical paths for AI-enabled English learning

A dense array of technology—related keywords in Figure 5 vividly illustrates the diverse and multi—layered technological pathways of AI-enabled English learning worldwide. AI technologies have formed a comprehensive technological matrix covering the full spectrum of English language skills training.

Supported by underlying machine learning algorithms (*computer, AI, system, big data*), various intelligent educational applications have been continuously optimized and updated¹. Intelligent tutoring systems provide learners with round-the-clock, unrestricted language learning support. *Automated writing evaluation* enables automatic assessment of English essays, including grammatical error correction, logical feedback, and linguistic refinement, effectively reducing the burden of manual grading. *Automatic speech recognition* supports oral pronunciation correction, listening material identification, and voice-based interactive practice. *Adaptive learning* systems dynamically adjust learning difficulty and content based on learners' proficiency levels. Chatbots construct immersive oral interaction scenarios, addressing the lack of speaking practice in traditional English classrooms² and shifting English learning from fixed classroom instruction to a full-time, full-process intelligent model.

Overall, the application of artificial intelligence in English education is characterized by multi-dimensional integration. Its core technical components include underlying algorithmic support, the construction of intelligent management systems, and the development of interactive tools and assessment platforms. Centered on improving students' comprehensive language proficiency, this technological system delivers personalized instruction through customized resource recommendation, real-time feedback, and precise diagnosis. A mature enabling mechanism has been established, featuring strong scenario adaptability, wide application scope, and continuous technological advancement, which has profoundly transformed traditional English learning practices³.

3.4.2 Shifts of empowerment to learners' internal development

The high-frequency keywords concentrated on the right side of the map reflect a comprehensive academic understanding of AI-enabled English learning. Early studies mainly focused on how intelligent technologies improve students' vocabulary acquisition, grammar analysis, and the four basic language skills (listening, speaking, reading, and writing)⁴. Current research has shifted its focus to the impacts of intelligent technologies on foreign language learners' psychological states and cognitive processes. (*anxiety disorder, experience, achievement*)

These effects include alleviating foreign language anxiety, cultivating positive learning attitudes, enhancing self-efficacy, promoting technology adaptation, and improving autonomous learning behaviors. Studies have shown that applying artificial intelligence in learning environments can effectively reduce pressure from traditional teaching, increase learner satisfaction, and stimulate intrinsic learning motivation⁵. Meanwhile, human-computer interaction has enhanced students' digital literacy, critical thinking, and other competencies, marking a key advancement of educational technology from instrumental application to emotional support, motivational guidance, and comprehensive ability development.

This trend reflects a people-oriented orientation in the intelligent development of foreign language education. It also indicates a major direction for future educational technology research: integrating technological innovation with humanistic care to meet personalized learning needs⁶ and promote holistic development.

3.4.3 Evolution of research hotspots and empowerment trends

The year color scale on the left of the map indicates the first occurrence of keywords, ranging from purple (2017) to red (2025). Warmer reddish-yellow colors represent more cutting-edge emerging topics. Font size corresponds to keyword frequency in the literature, and link thickness reflects the closeness of thematic connections. Based on these patterns, the evolutionary trajectory and future trends of AI-enabled English learning can be systematically summarized.

Early research focused on the support of basic intelligent technologies for traditional English education, exploring the initial integration of AI into foreign language teaching, mostly at a theoretical level⁷. In the middle and late stages, major advances in deep learning promoted practical applications such as intelligent assessment, personalized instruction, adaptive material development, and virtual classroom construction, emphasizing the integration of technological innovation with real teaching needs⁸. Currently, the field is in an innovative development stage. Driven by generative AI, researchers are further exploring improvements in human-computer interaction mechanisms⁹, analyses of user psychological effects¹⁰, and strategies for lifelong language competence cultivation in cross-cultural contexts³.

In terms of research content, the field has evolved from simple technical assistance to holistic education supporting the whole learning lifecycle, and finally to a strategic level focused on unleashing human potential. Overall, future research will adhere to a people-centered design philosophy to build personalized service models, strengthen ecosystem integration, and create more inclusive intelligent foreign language learning environments.

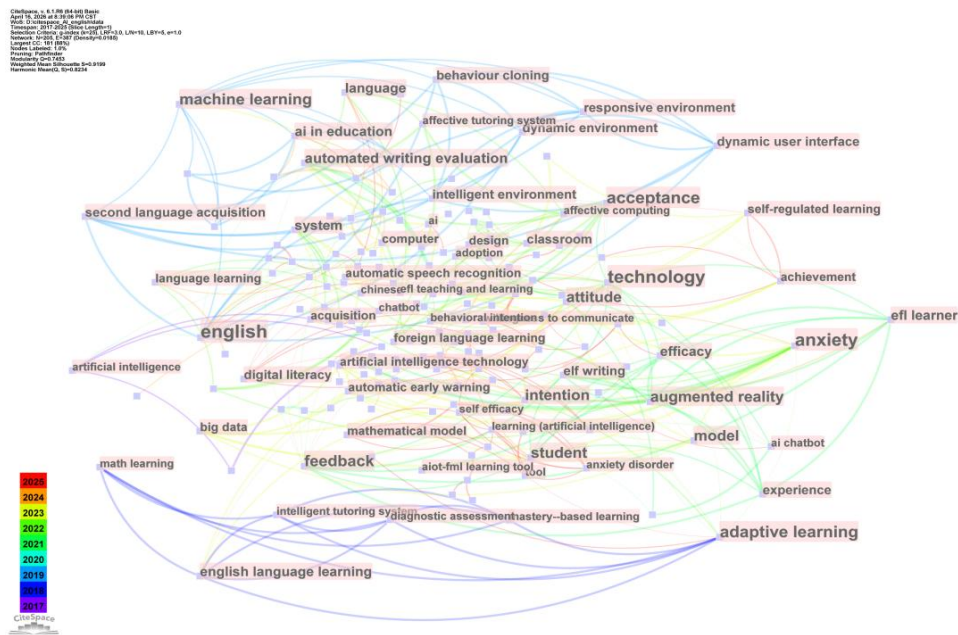


Figure5 Keyword co-occurrence map

Combined with the statistical results of high-frequency and high-centrality keywords in Table 1, the above conclusions can be further verified.

“Artificial intelligence” serves as the central node with the highest frequency and strongest intermediary role across the field (betweenness centrality = 0.69, total occurrences = 52).

Related technical keywords such as “generative AI”, “machine learning”, “adaptive learning” and “AI chatbot” all show prominent centralization characteristics, indicating that interdisciplinary technological integration has become the primary driving force for the development of AI-enabled English learning.

Professional terms focusing on language learning and ability development, including “English language learning”, “EFL learner”, “AI literacy” and “self-regulated learning”, appear frequently, reflecting that research has consistently centered on the nature of learning and individual developmental pathways.

From the temporal distribution of keyword first occurrences, early studies focused on traditional topics like machine learning and basic intelligent education theories, while recent research has shifted to cutting-edge issues such as generative AI and learner literacy. This shift aligns with the general academic trend from technology-driven to value-oriented development and reflects a significant change in research orientation.

Table1 Core keyword centrality and frequency statistics

Number	Core Keyword	Frequency	Centrality	Year
1	artificial intelligence	52	0.69	2021
2	generative ai	13	0.18	2024
3	english language learning	11	0.16	2018
4	language learning	10	0.06	2021
5	educational technology	10	0.16	2022
6	machine learning	8	0.1	2019
7	higher education	7	0.04	2022
8	artificial intelligence (ai)	7	0.05	2022
9	adaptive learning	6	0.04	2018
10	ai chatbot	6	0.06	2021
11	efl learner	6	0.08	2023
12	ai-assisted language learning	5	0.01	2025
13	self-regulated learning	5	0.02	2021
14	ai in education	5	0.03	2019
15	ai literacy	5	0.04	2024
16	willingness to communicate	5	0.05	2024

3.5 Keyword Cluster Analysis

The keyword clustering map generated in this study yields a modularity $Q=0.8306$, well above the threshold of 0.3 for effective mapping. The weighted mean silhouette value $S=0.9778$, far exceeding the ideal robustness threshold of 0.7. This confirms that the clustering boundaries are distinct and independent, with strong internal thematic homogeneity and scientifically rigorous structural partitioning, lending high credibility and academic validity to the visual analysis.

A total of eight distinct research clusters were identified, comprehensively covering the entire research landscape of AI-enabled English learning worldwide. An in-depth analysis is provided below, integrating the overall clustering structure, inter-topic correlation logic, the evolutionary pathway of technological empowerment, and general research characteristics of the field.

3.5.1 Overall thematic structure of the field

Based on the clustering distribution, spatial layout and network linkages of the map, the eight research clusters show clear thematic divisions and focused internal scopes, while maintaining close logical connections and hierarchical progression. Together they form a comprehensive framework covering theoretical foundations, technological iteration, learning scenarios, teaching innovation, language competence, literacy development and stage-specific educational applications.

All clusters focus on AI-enabled English learning without

isolated or irrelevant themes, indicating consistent international research interest. A unified framework integrating theory, technology and practice has taken shape in AI-integrated foreign language education. Research outcomes exhibit clear hierarchy and comprehensiveness, with notable advances in theoretical depth, technological application and instructional effectiveness. The field maintains a stable scope with considerable potential for further enrichment and expansion.

3.5.2 Intrinsic correlations

The visualization identifies eight core research clusters that form an integrated, interconnected cycle.

#4 Educational AI acts as the fundamental theoretical basis. #0 Mobile Learning and #3 Real-Time Intelligent Systems represent early application scenarios and technical carriers. #2 English Language Learning serves as the core educational focus. #1 Generative AI provides key technological momentum. #6 Human-Computer Collaborative Learning reforms teaching models, and #5 AI Literacy advances higher-order educational goals. All research ultimately targets #7 Language Proficiency Improvement, with #8 Higher Education covering sector-specific applications.

These eight clusters form an organic system with strong internal coherence, integrating theory and practice. Covering technology-driven educational reform and future trends, they constitute a complete framework for AI-enabled English learning.

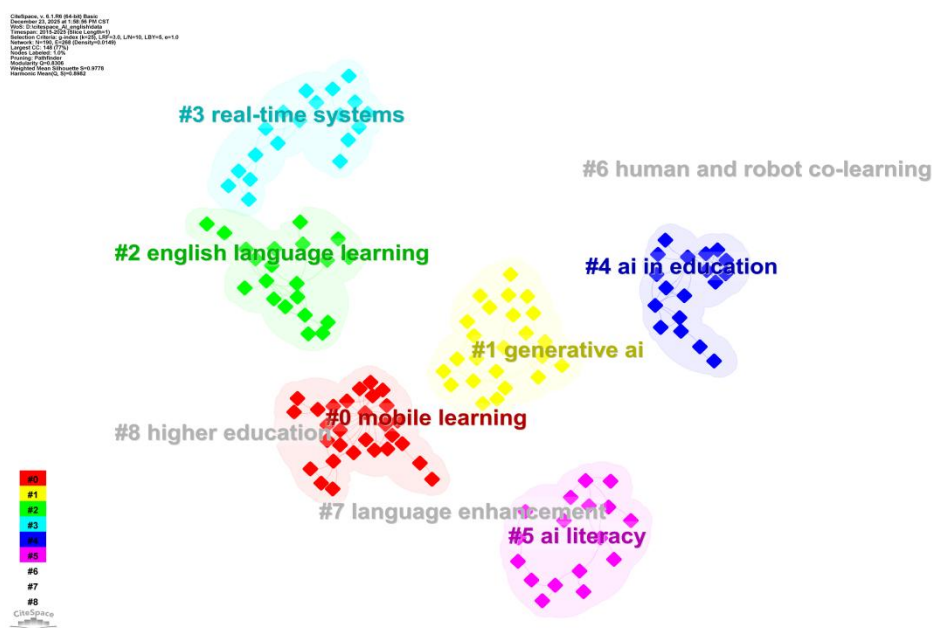


Figure6 Keyword cluster

3.6 Timeline Analysis

The timeline model constructed in this study (Figure 7) uses 2015-2025 as the horizontal time axis and adopts a layered vertical structure based on the core conceptual dimensions proposed earlier. This visual analytical framework clearly illustrates the origins, evolution, and periodical characteristics of key issues in AI-enabled English learning, including the introduction time of technologies, their developmental fluctuations, interactions among factors, and generational evolutionary drivers.

This approach enables a systematic understanding of research hotspot trends in recent years and supports a detailed analysis of technological features and developmental drivers across different periods.

3.6.1 Overall temporal evolution

An analysis of the eight research clusters from structural and temporal perspectives reveals that all clusters exhibit typical life-cycle characteristics, maintaining steady development without

interruption since 2015.

The vertical time series shows the research progress and functional evolution across periods. Emerging hotspots continue to emerge, while traditional core topics remain stable and systematic due to technological and interdisciplinary advances, providing solid support for disciplinary development. Horizontally, subtopics unfold sequentially and gradually evolve toward functional application. All branches focus on key issues in AI-enabled English learning, following a trajectory from initial exploration, to in-depth investigation, to current cutting-edge innovation.

This evolution reflects the academic vitality of this interdisciplinary field. Over the decade, research themes have expanded and deepened, the theoretical framework has matured, and the field has shown clear continuity and progressive development.

3.6.2 Phased thematic evolution and changes in empowerment connotations

Based on the emergence time of timeline nodes and keyword burst points, the decade-long development of AI-enabled English learning can be systematically divided into three progressive stages: the foundation stage, the technological application stage, and the cutting-edge explosive stage. The empowering characteristics and thematic evolution of each stage are as follows:

(1) the foundation stage (2015-2019)

The field is still in its infancy, with core issues emerging gradually. Keywords #0 mobile learning and #2 English language learning form its theoretical and practical framework. Mobile learning has advanced computer-assisted language teaching and facilitated the integration of new technologies like AI and VR. Early studies used intelligent algorithms to improve online English teaching efficiency and deliver personalized, ubiquitous learning

via mobile devices¹¹. While AI-based instructional design has been explored, research remains underdeveloped, lacking in-depth technology-innovation integration and sufficient case support, requiring further enhancement.

(2) the technological application stage (2020-2022)

Following the mature application of intelligent algorithms, technological innovation has moved from niche to mainstream, boosting rapid progress across fields. As a frontier area, #3 real-time system centers on intelligent tutoring, adaptive learning, automated assessment, interactive feedback and chatbots, showing strong research momentum. Research has shifted from theoretical analysis to practice-oriented exploration. Scholars seek to establish a comprehensive intelligent English learning system¹², integrating real-time interaction, personalized recommendation and automated evaluation to address key instructional challenges. AI has been widely applied to language skill development and learning process optimization, with a growing support system and continuous research advances¹².

(3) the cutting-edge explosive stage (2023-2025)

The popularity of generative AI has triggered a new round of explosive evolution.

#1 generative AI has become the core frontier, driving the rise of #5 AI literacy, #6 human-robot co-learning, #7 language enhancement and #8 higher education. Research has moved beyond traditional tool-based applications to a more advanced stage. Focusing on large model interaction, human-computer collaborative teaching, AI literacy development, advanced language competence and higher education integration, studies have shifted to a people-oriented approach. AI-enabled English learning has entered a new phase of comprehensive development in technology, pedagogy and literacy¹³.

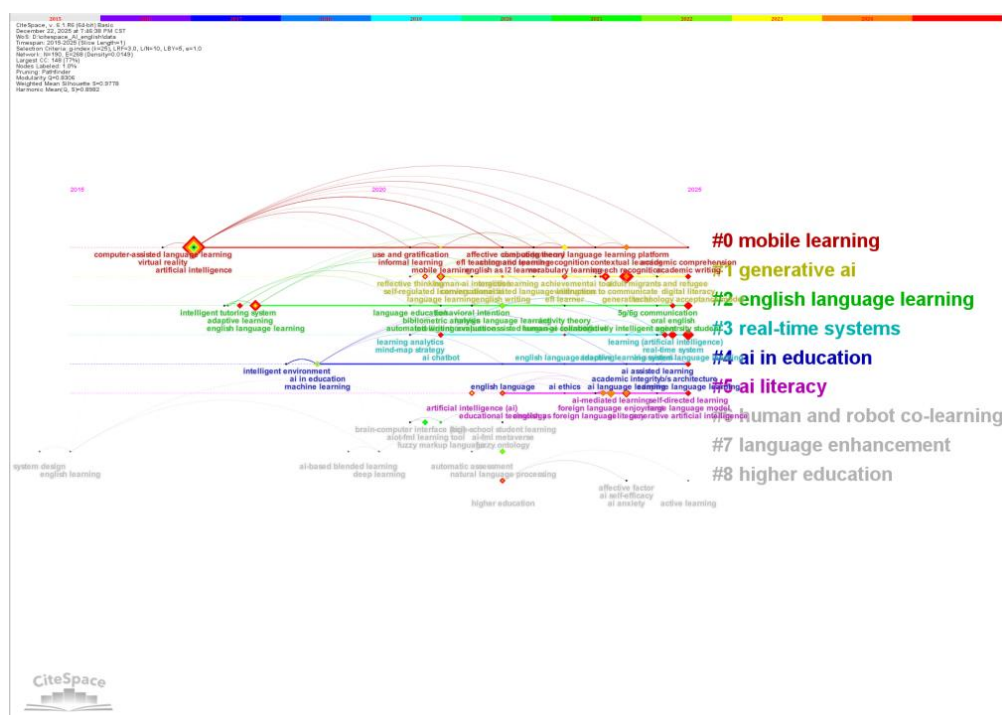


Figure7 Keyword timeline map

3.7 Analysis of Citation Burst

This study identified 9 strongest citation burst keywords in the field of AI-enabled English learning. Based on burst strength, start and end years, and duration, the map accurately reconstructs the dynamic emergence, succession, and continuity of research frontiers from 2017 to 2025. It clearly reveals the shifting pathways of academic focus at different stages, reflects key nodes of technological iteration, pedagogical application transitions, and core research changes, and systematically sorts out the evolutionary process of cutting-edge developments in the field.

The burst strength values allow a clear classification of research hotspots into hierarchical levels:

First-tier hotspots mainly reflect core academic concerns, with *design* and *system* as focal themes. Studies explore the potential of artificial intelligence in English teaching reform and conduct in-depth theoretical investigations into the design of intelligent educational systems, demonstrating high academic attention to this domain.

Second-tier keywords include *intelligent dialogue system*,

emotion regulation, and *text evaluation model*. These components cover theoretical dimensions such as technological integration and assessment system construction, as well as in-depth exploration of learners’ psychological characteristics, which together form the foundation for improving instructional effectiveness.

Third-tier elements consist of basic concepts from relatively low-level technical support, such as *deep learning* and *augmented reality*. These serve primarily auxiliary functions and have gradually faded from cutting-edge research as technologies have been widely applied.

The duration of burst periods enables effective distinction between short-term hotspots and long-term academic concerns. Topics such as *deep learning*, *augmented reality*, and *intelligent feedback* and *teaching systems* show phased characteristics and have gradually declined with technological progress. In contrast, *anxiety (foreign language anxiety)* and *acquisition (second language acquisition)* remain meaningful in both long-term and current research. They also indicate that a humanistic, essence-oriented research paradigm has become a major driving force for disciplinary development.

Top 9 Keywords with the Strongest Citation Bursts

Keywords	Year	Strength	Begin	End	2017 - 2025
deep learning	2020	0.95	2020	2022	
design	2021	1.94	2021	2022	
anxiety	2021	1.17	2021	2025	
automated writing evaluation	2021	1.15	2021	2023	
feedback	2021	1.03	2021	2022	
augmented reality	2021	0.97	2021	2022	
system	2022	1.84	2022	2023	
chatbot	2022	1.38	2022	2023	
acquisition	2023	0.76	2023	2025	

Figure8 Keyword burst map

4. Research Gaps and Future Prospects

Based on the comprehensive visual analysis of annual publication trends, institutional and author collaboration networks, keyword co-occurrence, clustering, timeline, and burst maps presented earlier, the current academic research in the field of AI-enabled English learning has formed an integrated research paradigm. This paradigm is based on multimodal technology integration, centered on systematic construction, and oriented toward clear research questions.

However, there are obvious deficiencies in several key aspects, including academic research regional diffusion, homogenized research segmentation and psychological and humanistic research. In light of the future academic development trends of the discipline and the actual needs of education, this paper elaborates on the main shortcomings of existing literature and proposes several forward-looking research directions, aiming to provide strong theoretical support and practical reference for future research and teaching improvement.

4.1 Research Gaps

The academic field of AI-enabled English learning shows

regional agglomeration, with most research concentrated in East Asia (especially Chinese mainland, Hong Kong, Macao and Taiwan regions), and low participation from non-Asian regions. Transnational and inter-institutional cooperation develops slowly.

Current research has obvious homogenization, lacking localized and personalized theoretical frameworks. Most studies focus on general intelligent technology application, with insufficient research on basic education and vocational education, and inadequate attention to diverse learner needs.

Research on second language acquisition driven by psychological traits is in the initial stage, with insufficient systematic research on learning anxiety dynamics and humanistic care in AI teaching scenarios.

4.2 Future Prospects

To address insufficient cross-regional cooperation, future efforts should establish sound cross-border academic mechanisms and multilateral research platforms. Cooperation between Eastern and Western institutions should be promoted through comprehensive projects across diverse cultural and linguistic regions. Integrating expertise in technology, foreign language education and psychometrics will help build an inclusive global

research network and enhance the practical impact of findings worldwide.

Systematic research tailored to specific scenarios is needed to improve the matching of AI technologies. Future studies may cover basic, vocational and adult education, as well as international students, with attention to the needs of children, underachievers and special groups. Learner profiling and competency models can refine adaptive pathways and personalized interventions to support continued AI development.

Finally, to strengthen people-centered education, a humanistic research paradigm should be adopted to return to educational essence. Research should deeply explore learners' psychological traits and systematically examine how AI alleviates language anxiety, boosts motivation and self-efficacy, and fosters autonomous learning. Targeted training should enhance teachers' AI instructional skills, forming a professional development path and a human-computer collaborative teaching system. A new educational ecosystem of "technology-enabled, teacher-guided, student-centered" can thus be established.

5. Conclusion

This study analyzed 200 English papers (2015-2025) from the Web of Science Core Collection using CiteSpace for bibliometric visualization. The field has seen growing academic outputs, forming a technology-oriented and people-centered research system. In recent years, research focus has shifted from single AI technology application to in-depth study of learners' psychological mechanisms and second language acquisition rules. With the global promotion of generative AI, relevant research achievements and academic influence have continuously improved, with important theoretical significance and broad prospects.

AI has been integrated into English listening, speaking, reading and writing training, providing systematic support for learning and teaching, and promoting educational informatization towards personalized growth and personality shaping. Despite changing research themes, the core characteristics of English learning remain unchanged, and technological innovation drives the transformation of research paradigms.

While significant achievements have been made, there are prominent difficulties, including insufficient international cooperation, limited refined research, lack of practical cases, inadequate exploration of human-computer interaction mechanisms, and lagging theoretical and ethical systems. Future research should focus on international academic exchanges, interdisciplinary integration, practical application in education scenarios, empirical analysis of human-computer collaborative education, and improvement of theoretical frameworks and ethical norms to promote the standardized and humanized integration of AI in English learning.

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