

Exploration of Research Hotspots in Technology-Enabled Oral English Teaching in China (2010-2025): Based on CiteSpace

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Abstract

Against the backdrop of advancing educational digitization, the auxiliary role of digital technology in oral English teaching has become increasingly prominent. As a global topic within the field of Computer-Assisted Language Learning (CALL), technology-enabled oral instruction manifests diverse pathways across different national contexts. This study employs CiteSpace 6.3.R1 software to conduct a visualization analysis of relevant journal articles indexed in China National Knowledge Infrastructure (CNKI) from 2010 to 2025. The aim is to explore research hotspots and evolutionary trends in technology-enabled oral English teaching within China. Results indicate a generally growing research interest in this field, with hotspots concentrated on the application of technologies such as artificial intelligence in higher education. However, the research still faces challenges: empirical studies remain overly concentrated on higher education in terms of breadth, while in depth they mostly focus on verifying short-term effects, lacking in-depth examination of long-term impacts and ethical dimensions. By mapping China's research landscape, this study aims to provide a differentiated case reference for global research in this field. Future research should deepen toward a systematic approach characterized by multi-contextual, long-term, and deeply integrated approaches to build a more mature smart education ecosystem.

Keywords: Oral English Teaching; Technology-Enabled; Citespace; Visualization Analysis

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1. Introduction

Technology-enabled language learning stands as a central theme in the global digital transformation of education. The report to the 20th National Congress of the Communist Party of China emphasizes the imperative to "promote educational digitalization and build a learning society and a learning nation where lifelong learning is pursued by all" (Xi, 2022), which represents a national strategic response to this global trend. Guided by this strategy, digital technology, as the core driver of technological revolution and educational transformation, is profoundly reshaping teaching formats and models. Particularly in the field of English teaching, the integrated application of technologies such as artificial intelligence, online platforms, and virtual reality tools has optimized teaching processes and learning experiences, effectively enhancing language acquisition efficiency (Xiong & Zheng, 2024). As a critical language competency among core competencies, oral English proficiency serves as a tangible expression of learning and understanding, applying and practicing, and transferring and creating. In the long run, it can broaden international perspectives and enhance cross-cultural communication skills (Li, 2023). Realizing this value largely depends on the quality of oral English teaching, whose effectiveness directly affects the quality of cultivating learners' comprehensive pragmatic abilities.

Currently, the international academic community has produced a substantial body of empirical research on technology-enabled oral English teaching. However, most studies focus on small-scale case analyses, lacking a comprehensive examination of the broader research landscape within specific countries or regions. Therefore, this paper utilizes CiteSpace 6.3.R1 visualization software to conduct a bibliometric and visual analysis of relevant literature indexed in China National Knowledge Infrastructure (CNKI) from 2010 to 2025. It aims to focus on this core Chinese database to explore the research hotspots and evolutionary trends of technology-enabled language teaching in China. Through this regional knowledge map analysis, it seeks to provide a Chinese case study for understanding the global diversity of technology-enabled language teaching practices and offer references from the Chinese context for future in-depth research in this field.

2. Research Design

2.1 Research Tool

This study employs CiteSpace 6.3.R1 software as the core analytical tool for conducting visual analysis and knowledge map construction of relevant literature. Based on scientometrics principles, this software effectively extracts key information from literature through a combination of quantitative and graphical methods. It clearly illustrates research hotspots, evolutionary pathways, and development trends in a specific field via knowledge maps. Leveraging its functional features, this paper systematically presents the research hotspots in technology-enabled oral English teaching and their temporal variations, thereby enhancing the objectivity and scientific rigor of the research findings.

2.2 Data Sources

This study utilizes the China National Knowledge Infrastructure (CNKI) database as its primary data source. Advanced search mode was employed with the theme terms “英语口语教学 (English oral teaching)” combined with either “技术 (technology),” “人工智能 (artificial intelligence),” “计算机辅助 (computer-assisted),” or “在线平台 (online platform).” The search was limited to journal articles published between January 2010 and July 2025. After excluding dissertations, book reviews, and low-relevance literature from the initial results, a total of 258 valid articles were obtained. These were exported in RefWorks format as the research sample.

Agricultural University have been particularly active. This distribution pattern also suggests that research in this field has yet to develop a comprehensive framework for collaborative advancement across multiple levels and types of institutions.

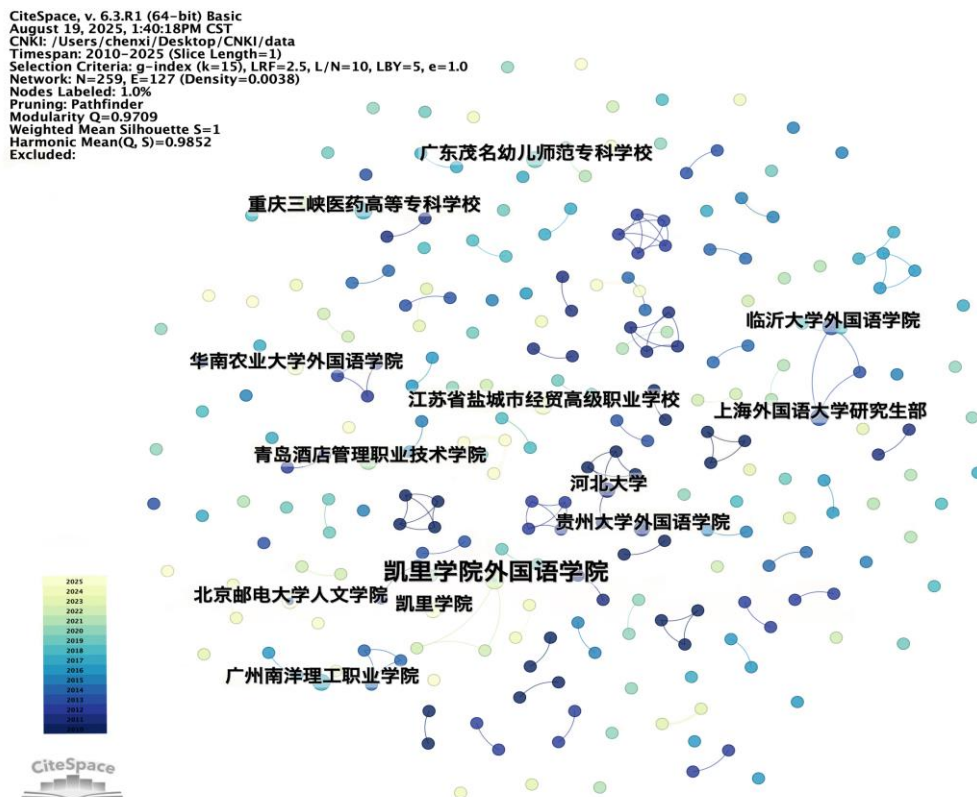


Figure 2. Institutional co-occurrence map

3.2 Overall Trends

The volume and chronology of published literature reveal the academic evolution of technology-enabled oral English teaching in China (Yan, 2024). Figure 3 illustrates the number of research papers published in this field and their respective publication years. The curve chart indicates that the overall publication volume in this domain has exhibited a fluctuating upward trend. Since 2010, the publication volume has gradually increased. Although temporary declines occurred at points such as 2014, subsequent recoveries were pronounced, particularly reaching a peak of 34 papers in 2020. This reflects a significant surge in research activity during that phase. Although the publication volume has fluctuated since 2020, it has still shown a gradual upward trend on the whole. Sustained research vitality fully demonstrates that the integration of technology and oral teaching has firmly established itself as one of the core issues in foreign language informatization teaching. With the advancement of educational informatization and the development of information technologies such as artificial intelligence, this field is poised to generate more research outcomes in the future.

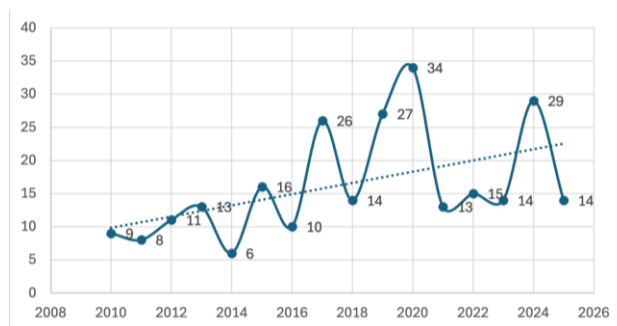


Figure 3. Distribution curve of publication volume

4. Data Analysis and Discussion

4.1 Analysis of the Keyword Co-occurrence Map

Keywords represent a high-level condensation of the themes of literature; co-occurrence knowledge maps help visualize high-frequency keywords emerging in a specific research field, thereby revealing hotspots, trends, and relationships among research entities (Luo, Zhang, & Li, 2021). To explore research hotspots in China regarding technology-enabled oral English teaching, the researcher employed CiteSpace 6.3.R1 software to generate a keyword co-occurrence network for studies on this topic from 2010 to 2025 (see Figure 4). Within this map, node size represents keyword frequency, with larger nodes indicating higher occurrence rates.

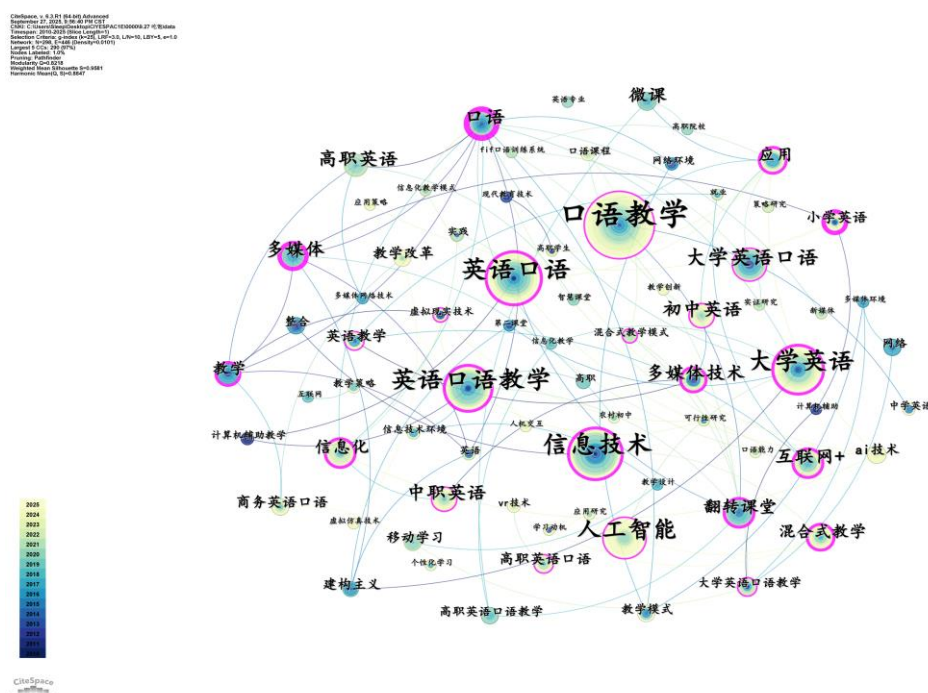


Figure 4. Keyword co-occurrence map

As shown in Figure 4, keyword nodes such as "college English," "higher vocational English," "information technology," "artificial intelligence," and "secondary vocational school English" stand out prominently, reflecting that these topics are high-frequency research hotspots in this field. This paper organizes the research hotspots in this field from three dimensions: research subjects, research perspectives, and research directions.

(1) **Research Subjects.** The frequently appearing keywords "college English" and "higher vocational English" indicate that academia places in China high emphasis on the application of oral English teaching technologies at the higher education stage. Digital transformation has become a core issue in the reform, development, and practice of higher education globally and within China (Wu, 2023). *China's Education Modernization 2035*, released in 2019, explicitly puts forward the strategic task of "accelerating educational reform in the information age" (The Communist Party of China Central Committee & The State Council [CPC Central Committee & State Council], 2019). As the core stage for cultivating international talents, the integration of oral English teaching with technology in higher education has become a focus of academic attention. For instance, empirical research by Wu Jianhao et al. (2024) demonstrates that generative AI significantly enhances the oral complexity and fluency of college English learners by providing comprehensible input, creating authentic interactions, and delivering instant feedback. This study offers a crucial insight into why "college English" has become a research hotspot: it reveals an effective pathway for applying technology in higher education oral classrooms—namely, driving competence improvement by reinforcing the core element of "interaction". Consequently, this research orientation fundamentally concerns enhancing students' cross-cultural communication abilities and shaping their global competitiveness, which carries distinct contemporary significance.

(2) **Research Perspectives.** Current studies primarily explore multidimensional approaches centered on "teaching practice," "teaching reform," and "teaching application." For a long time, oral English teaching in China has grappled with issues such as "overemphasizing knowledge transmission over practical application" and "insufficient classroom interaction with low student engagement." With the rapid advancement of information technology, leveraging technological means to innovate teaching models and optimize teaching processes has become key to addressing these challenges. Wang Linhai et al. (2018) provide an excellent example of this. They deeply integrated the CDIO engineering education philosophy with the flipped classroom model, constructing an oral teaching model whereby students engage in active learning and collaborative inquiry throughout the complete process of "conceptualization-design-implementation-operation". Such research exemplifies researchers prioritizing teaching practice in their investigations. They are committed to integrate technologies like artificial intelligence and online learning platforms into real-world teaching scenarios to explore their feasibility and effectiveness. This trend aligns with the policy direction proposed by China's Ministry of Education in 2019: "Actively developing 'Internet + Education,' exploring new forms of intelligent education, and promoting the classroom teaching revolution (CPC Central Committee & State Council, 2019)." Against this backdrop, leveraging technology to propel comprehensive reform in oral English teaching—from conceptual frameworks to pedagogical methods—has become an imperative for adapting to the new era of educational development and a shared objective for both academia and the education sector.

(3) **Research Directions.** Research directions in this field mainly encompass the practice and innovation of technologies such as "artificial intelligence," "online platforms," "virtual simulation," and "mobile learning" in oral English teaching. Analysis of representative literature indicates that the technological hotspots revealed by keywords are underpinned by solid application value. Artificial intelligence, through speech recognition and multidimensional analysis capabilities, can deliver precise and efficient oral English assessment results, enable personalized learning guidance, and enrich assessment formats and learning resources (Zhu, 2025). Online learning platforms not only provide students with a large amount of learning materials but also create opportunities for them to communicate with peers from different countries and regions, thereby improving their oral communication skills (Han, 2024). Virtual simulation technology creates immersive learning scenarios, helping students visualize and perceive concepts tangibly. This significantly enhances the

effectiveness of language input and output, elevating the quality of oral English teaching (Ma & Ouyang, 2020). Mobile learning further breaks temporal and spatial constraints and promotes self-directed learning by pushing personalized resources, thereby enhancing students' mastery of oral English (Zhang & Fu, 2017). These technologies collectively elevate both the quality and quantity of language output through diverse pathways, jointly constructing a more flexible, timely-feedback, and student-centered new model of oral English teaching.

4.2 Keyword Clustering Analysis

Keyword clustering analysis is a process that, based on co-occurrence analysis, uses statistical clustering methods to simplify the co-occurrence network relationships into a relatively small number of clusters (Zhong, Li, & Yang, 2008).

This study uses "keywords" as nodes and generates a keyword clustering co-occurrence map using CiteSpace (see Figure 5) to reveal research hotspots in the field of technology-enabled oral English teaching in China. Multiple significant clusters can be identified from this map: #0 Teaching Model, #1 Junior High School English, #2 Secondary Vocational School English, #3 Teaching Strategy, #4 College English, #5 Self-Directed Learning, #6 Artificial Intelligence, #7 Human-Computer Interaction, and #8 Information Technology.

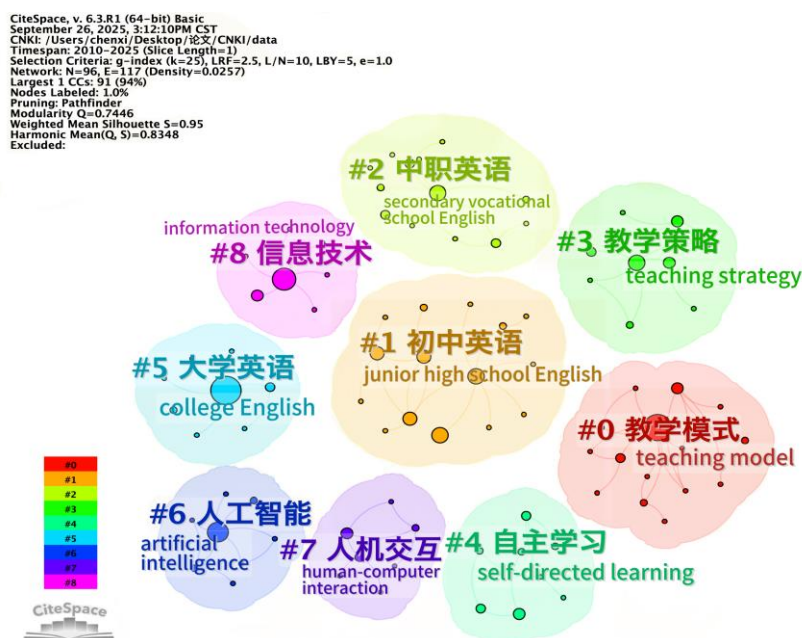


Figure 5. Keyword clustering map

Table 1 indicates that while each cluster exhibits relative independence in research scope, they maintain underlying interconnections.

First, the intertwined clusters of "Teaching Model," "Teaching Strategy," and "Self-Directed Learning" reveal that current research focuses heavily on how to use technology to construct a new learner-centered teaching model. The emerging focus reflects a shift in Chinese academia's understanding of technology's role in education—from its initial positioning as an "auxiliary tool" to a more proactive "teaching enabler." And the core goal of this transformation is to cultivate more autonomous learners. For instance, through action research on blended teaching of college English speaking courses, Liao Genfu and Zou Xiaoping (2019) found that integrating MOOC platforms with flipped classroom structures not only stimulates students' motivation for oral English learning

and enhances their expressive abilities, but also promotes knowledge internalization and autonomous learning. This demonstrates the practical role of technology as an "instructional enabler" in advancing student-centered teaching transformation. This focus resonates with core principles long advocated in international language education. As McLoughlin & Lee (2010) noted, the core value of social software in the Web 2.0 era lies in transferring control over learning to learners by enhancing their agency, autonomy, and engagement within social networks. Therefore, the focus on "autonomous learning" in research can be seen as a proactive response to the global educational discourse of "learner-centeredness", directly demonstrating the significance and feasibility of this concept within the Chinese context.

In addition, technology-related clusters such as "Artificial Intelligence," "Human-Computer Interaction," and "Information Technology" exhibit significant correlations with teaching stage clusters like "Junior High School English" and "College English." This phenomenon clearly reveals that technology has become the core driver for promoting reforms across various teaching stages, providing innovative support for the development of oral English teaching.

Notably, Chinese research demonstrates a particular focus on "Oral Testing" and "Washback Effect" within the "Human-Computer Interaction" cluster. Zhao Changan (2012) demonstrated this focus early on through his feasibility study and technical design for net-based large-scale oral testing for higher education. This research not only aimed to achieve "large-scale" and "standardized" assessment through technology, but also inherently considered the "washback effect" of testing—specifically, it sought to urge teaching practices to place greater emphasis on students' oral communication competence by popularizing oral English testing. The positive washback effect of such tests on teaching has gradually become prominent. For instance, they encourage teachers to adjust their teaching priorities based on test feedback, placing greater emphasis on cultivating students' authentic oral communicative competence rather than merely imparting test-taking techniques (Hong, 2010). This focus highlights the localized characteristics of technology application within China's unique examination culture. While technology empowers oral English teaching, it simultaneously generates a practical demand within academia for reforming the assessment system.

The interrelated characteristics of these clusters offer directional guidance for future multidimensional and cross-domain research in this field.

Table 1. Keyword clustering table

Cluster No.	Cluster Title	Main Cluster Contents
0	Teaching Model	Higher Vocational English; Virtual Simulation Technology; Learning Motivation; College English
1	Junior High School English	Micro-Courses; Teaching Application; Teaching Practice; College English
2	Secondary Vocational School English	Informatization; Teaching Effect; Situational Teaching; Technology Empowerment
3	Teaching Strategy	Internet+; Network Technology; Analysis; Secondary School English
4	College English	Curriculum Design; Flipped Classroom; Mobile Learning; Podcast Technology
5	Self-Directed Learning	Constructivism; Technology-Assisted; Higher Vocational English; Internet +

6	Artificial Intelligence	Communicative Competence; Information Technology; Ai Empowerment; Cross-Cultural Awareness
7	Human-Computer Interaction	Oral English Testing; Intelligent Dialogue; Washback Effect; Washback Function
8	Information Technology	Primary School English; Integration; Distance Teaching; Teaching Situation

4.3 Analysis of the Keyword Timeline Map

The timeline map is a visualization tool in CiteSpace used to present the trajectory of research topics over time. With the timeline as the horizontal axis, this map distributes research keywords from different periods across corresponding time zones based on their occurrence time. It clearly illustrates the emergence, persistence, and evolution of research hotspots, as well as the developmental trends of cutting-edge themes.

The timeline map for technology-enabled oral English teaching from 2010 to 2025 (see Figure 6) reveals a phased development of research hotspots in this field.

From 2010 to 2015, research centered on "Information Technology" and "College English" constituted the "Preliminary Exploration Period" of technology-enhanced oral English teaching. During this period, national-level strategic planning set the tone for the development of educational informatization. The State Planning Outline for Medium and Long-Term Education Reform and Development (2010-2020), issued in 2010, incorporated "educational informatization" into the overall national informatization development strategy for the first time, explicitly stating that "information technology exerts a revolutionary impact on educational development" (People's Daily, 2010). Against this backdrop, higher education, as the vanguard for the application of educational technology, naturally became the research focus of this period. For example, the college English oral communication supplementary learning platform developed by Wu Zhenghong (2012) is a typical representative of this exploratory phase. This study designed an online platform comprising five major modules: system management, basic information, self-directed learning, oral English mutual assistance, and expert support. It aimed to expand students' oral practice opportunities by providing rich multimedia resources and interactive exercises. Findings revealed that the platform effectively enhanced students' learning motivation, confidence, and language application skills, demonstrating the potential of information technology to supplement traditional classroom limitations and preliminarily empower oral language teaching. Although technology and teaching did not achieve in-depth integration at this stage, the relevant explorations accumulated essential practical experience for the subsequent development of the field.

From 2015 to 2020, keywords such as "artificial intelligence," "teaching models," and "self-directed learning" emerged as research hotspots. This phenomenon indicates that the research scope and theoretical depth of technology-enhanced oral English teaching in China have significantly expanded and deepened compared to the previous stage. Among these, cutting-edge technologies like artificial intelligence served as core driving forces. They not only directly promoted innovation in oral English teaching from "teacher-centered" to "student-centered" but also demonstrated distinct personalized support capabilities in practice. Through advanced algorithms, AI can recommend tailored learning content for learners based on their proficiency levels, needs, and preferences (Huang et al., 2023). The integration of technological applications with constructivism theory and autonomous learning principles has established a robust theoretical foundation. Concurrently, the emergence of keywords such as "junior high school English" and "vocational English" signifies a broadening research scope toward basic education and vocational education, reflecting the academic community's growing attention to diverse learner groups and

educational contexts. For instance, when exploring AI-enabled listening and speaking instruction in junior high school English, Jiang Yanling & Ma Juan (2020) pointed out that speech recognition technology can achieve real-time scoring and feedback by comparing learners' pronunciation against standard speech databases. Educational robots, meanwhile, can construct authentic conversational scenarios, record and analyze students' oral performance, thereby providing concrete pathways for human-computer interactive oral training and assessment.

After 2020, research has shifted its focus to new areas such as "precision teaching," "integrated application of intelligent technology," and "human-computer interaction," indicating that research has entered a stage of refinement and integration. Current research frontiers concentrate on the synergistic application of big data and artificial intelligence technologies to achieve accurate diagnosis and dynamic intervention of learners' individual status, thereby realizing personalized learning objectives in large-scale teaching scenarios. This research pursuit reflects a transformative trend in teaching models, shifting from macro-level, uniformed approaches toward micro-level, adaptive methodologies. From the perspective of specific practical cases, Xu & Zhao (2024) explored prompt engineering and proposed that large language models can serve as intelligent assistants in English teaching, effectively enhancing teaching quality and effectiveness. Furthermore, the emergence of concepts such as "smart education" and "ecological models" echoes the view of smart education ecology advocated by scholars like Zhu & He (2012). This heralds that the field is shifting from focusing on isolated technological applications to building systematic and ecological frameworks that foster harmonious coexistence among technology, pedagogy, and the teacher-student relationship.

Overall, over the past fifteen years, research on the integration of technology and oral English teaching in China has undergone continuous deepening and expansion. Future studies should continue to focus on the core direction of "teaching model," leveraging artificial intelligence and information technology to explore innovations in oral English teaching across educational stages within a multi-technology convergence context. This will effectively promote the development of this field in a more precise and systematic direction.

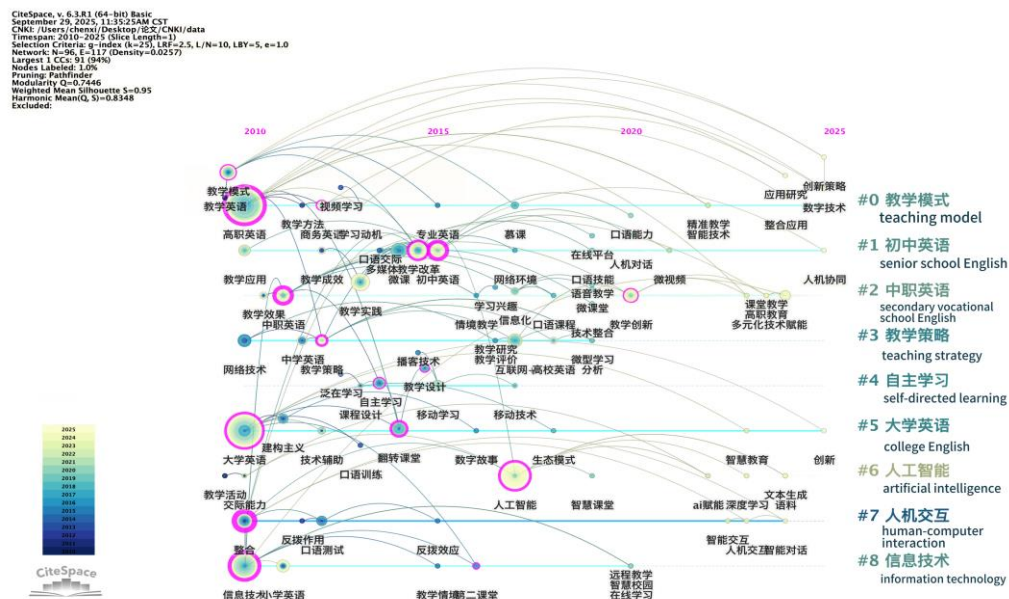


Figure 6. Keyword timeline map

5. Conclusion

This study employs CiteSpace 6.3.R1 visualization software to conduct a bibliometric analysis of 258 journal articles published between 2010 and 2025 concerning technology-enabled oral English teaching in China. Results indicate that while the annual publication volumes fluctuate, it presents an overall upward trend. Research hotspots have consistently centered on the two core themes of technology and oral English teaching. Particular attention is focused on the integration and innovation of information technologies, such as artificial intelligence, within teaching practice, with ongoing refinement. Existing research has accumulated substantial findings, laying a crucial foundation for future exploration.

However, in reviewing existing research findings, this study also identified two key gaps in the field. In terms of research breadth, current empirical explorations predominantly focus on higher education, with insufficient attention paid to diverse educational contexts such as secondary school English and elementary school English. This imbalance creates an uneven landscape across the research spectrum. In terms of research depth, most findings remain confined to verifying the short-term, immediate effects of technology, lacking long-term tracking of learning outcomes. Few studies critically examine the deeper implications of technology application, such as the potential restructuring of teacher-student roles and data ethics.

Therefore, grounded in China's local research context, future explorations in this field need to proactively broaden the scope of empirical research contexts and delve into differentiated adaptation pathways for technology across various educational stages. Simultaneously, efforts should focus on advancing long-term, in-depth studies while actively addressing the humanistic concerns and ethical reflections underlying technology-enabled education. This necessitates organically integrating technology's instrumental nature with education's essential purpose to construct a smart oral teaching ecosystem that balances efficiency with healthy development. Ultimately, this aims to provide Chinese perspectives and practical insights for the global development of this field.

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