

Research on Ecological Affordances in L2 Classrooms Based on CNKI: Hotspots and Trends (2015–2025)

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Abstract: This study addresses the need to systematically map the evolving research landscape of ecological affordances within China's foreign language teaching (FLT) context over the past decade (2015–2025). Employing a scoping review methodology, it analyzes relevant literature from the CNKI database using CiteSpace for visual knowledge mapping and cluster analysis. The research aims to identify publication trends, key research themes, influential contributors, and the developmental trajectory of this domain. 1) The findings reveal a field characterized by fluctuating but overall growth, delineated into three developmental phases; 2) Four primary research clusters were identified: Tracing studies on ecological affordances theory, transformational studies, practical studies, and expansions into emerging technological and cultural dimensions; 3) Key scholars and productive institutions, such as Dalian University of Foreign Languages and Shanghai International Studies University, were pinpointed; 4) The evolution of the field demonstrates a clear progression from theoretical importation to localized innovation and from macro-level constructs to nuanced, multi-perspective investigations. The study concludes that ecological affordances research has significantly enriched FLT discourse in China, offering a structured synthesis of its progress and suggesting pathways for further integrating ecological perspectives into pedagogical practice.

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1. INTRODUCTION

In recent years, foreign language education research has undergone a significant ecological turn, with scholars beginning to view the learning environment as a crucial "source of affordances." Specifically, language learners can rely on ecological affordances to establish direct connections with the environment, and the interaction between learners and the environment can create learning opportunities and trigger effective learning (van Lier, 2004). This research provides an important theoretical foundation for enhancing the connection between learners and the environment and for promoting foreign language teaching.

The concept of "affordance" originally belongs to the field of ecological psychology, where it is regarded as "what the environment offers, provides, or furnishes to an organism, whether positive or negative," revealing the constructive role of perceptual learning in cognitive development (Gibson, 1979). Since then, this theory has been inherited and developed across different disciplines: Norman (1999) introduced it into human-computer interaction and user experience research, initiating explorations into the application of affordances in technology; van Lier (2000) brought this concept into the field of second language acquisition, interpreting it as the opportunities or possibilities that the environment provides to learners, and proposed replacing the core term "input" from Krashen's (1989) second language acquisition theory with "affordance." The affordance model proposed by van Lier (2004) indicates that the transformation process of ecological affordances in language learning goes through the stages of "perception, interpretation, and action" (as shown in Figure 1), emerging from the cyclical interaction among these three elements.

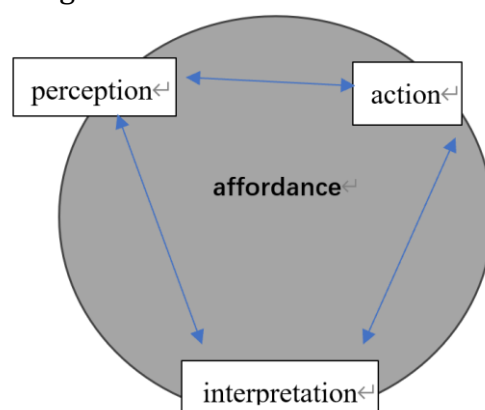


Figure 1. van Lier's (2004) Affordance Model

The developmental trajectory of ecological affordance theory from the perspective of international language education has become relatively clear. Early research primarily focused on classroom discourse analysis (Kramsch, 2003; Thoms, 2014), gradually shifting toward an informational research paradigm (Basharina et al., 2008; Chen, 2022). Studies such as Aronin and Singleton's (2012) exploration of "pedagogical affordance" and Jonathan and Georges' (2009) examination of the current status and future of "affordance-based design" broadened the interdisciplinary application pathways of affordance theory. With the advent of the information society, research orientations have shown a trend toward diversification. In terms of learner dimensions, scholars have

explored emotional factors (McNeil, 2014; Elahi Shirvan & Taherian, 2022), remote collaborative learning, and second and foreign language acquisition, among other topics. At the level of teaching practice, research has covered areas such as flipped classrooms, translanguaging, oral language teaching, and second language writing (Elola & Oskoz, 2017). In the realm of teacher development, the focus has been on teachers' practical research and professional growth (Manca, 2020). In the application of technology, scholars have explored the use of virtual simulations, artificial intelligence, and other human-computer interaction technologies in ecological learning environments. Concurrently, the field continues to deepen its integration with sociocultural theory (Gánem Gutiérrez, 2008), forming a research framework where theory and practice mutually support each other. Taking research on teacher feedback in English classrooms from an ecological perspective abroad as an example, studies have shown that the ecological affordances provided by teacher feedback play a positive guiding role (Hidi & Renninger, 2006). Teacher feedback can offer scaffolded support across various educational models (e.g., Hofstadler et al., 2021). Written feedback (Han, 2019), oral feedback (Thoms, 2014), and diversified feedback (Hattie & Timperley, 2007) together constitute rich sources of affordances in the classroom. Teachers should strive to effectively mobilize ecological affordances in the learning process (Ziglar, 2012). Furthermore, teacher feedback, as a form of classroom affordance, also functions to regulate learners' beliefs (e.g., Peng, 2011; Thoms, 2014). Learners' awareness of such feedback and their subsequent learning engagement exhibit dialogic, interactive, and knowledge-oriented characteristics (Beck, 2000). At the same time, learners' perception, interpretation, and action in response to feedback vary from person to person (Ajjawi & Boud, 2017). Related research has formed a systematic understanding of these dynamics.

Domestic scholars have also conducted a series of fruitful explorations around ecological affordance theory in the field of foreign language education, with a relatively clear research trajectory. The development of related research directions can be broadly divided into four stages. The first stage began in 2015, marked by scholars such as Qin and Dai (2015) introducing ecological affordance theory, which formally entered the field of domestic linguistics and foreign language education research. The second stage occurred around 2018, as the research focus gradually shifted toward the localized construction of theoretical frameworks. Scholars such as Huang and Long (2018) systematically explored the macro-level relationship between ecological affordance theory and foreign language education, laying the theoretical foundation for subsequent empirical research. The third stage, spanning from 2020 to 2024, saw a noticeable "practical turn" in domestic research. Scholars moved beyond theoretical explanations and shifted their focus to specific teaching practices. Representative achievements during this period included Cai's (2021) empirical study on the relationship between affordance perception and English learning engagement, as well as Zhang and Liu's (2024) in-depth analysis of the affordance transformation mechanism of teacher feedback in English classrooms. This stage of research propelled ecological affordance theory from a macro-level framework toward a deepening and refinement of micro-level classroom practices. In the fourth stage, scholars represented by Xu (2025) began exploring pathways to

integrate ecological affordance theory with cutting-edge technologies such as generative artificial intelligence. Domestic research gradually moved toward a stage of integration and innovation with intelligent technologies, focusing on the design and teaching practices of new ecological affordances in the context of technological empowerment. This trend indicates that foreign language education research in China is transitioning from theoretical introduction to interdisciplinary integration, demonstrating broad development prospects and application potential.

Therefore, systematically reviewing and examining the developmental trajectory, research hotspots, theoretical contributions, and current status of ecological affordance theory in the field of domestic foreign language education will not only help to clearly understand the current state and effectiveness of the theory's localized application but also accurately identify breakthroughs and growth points for future research. This study aims to provide a systematic review and comparative analysis of the literature related to ecological affordance theory in China, outlining the full picture of the theory's development in the field of domestic foreign language education. On this basis, it seeks to explore the pathways for its localized construction and application prospects, with the goal of providing theoretical support and practical insights for building a more "affordance-rich" ecological environment for foreign language education in China.

2.METHOD

2.1 Research Questions

This study aims to review the current state of ecological affordances research in the field of foreign language education over the past decade (2015–2025), with the goal of understanding the status and developmental trends of ecological affordances theory in China's foreign language education context. Specifically, this study addresses the following questions:

RQ1: what is the overall landscape of ecological affordances research in foreign language education?

RQ2: what are the research hotspots in the field of ecological affordances in foreign language education?

RQ3: who are the representative authors in ecological affordances research in foreign language education?

RQ4: which institutions are the primary contributors to publications on ecological affordances research in foreign language education?

RQ5: what are the developmental trends in ecological affordances research in foreign language education?

2.2 Data Sources and Processing

This study employed a scoping review methodology (PRISMA-P) to conduct a rapid evidence assessment of the literature, which included the following three stages (see Figure 2).

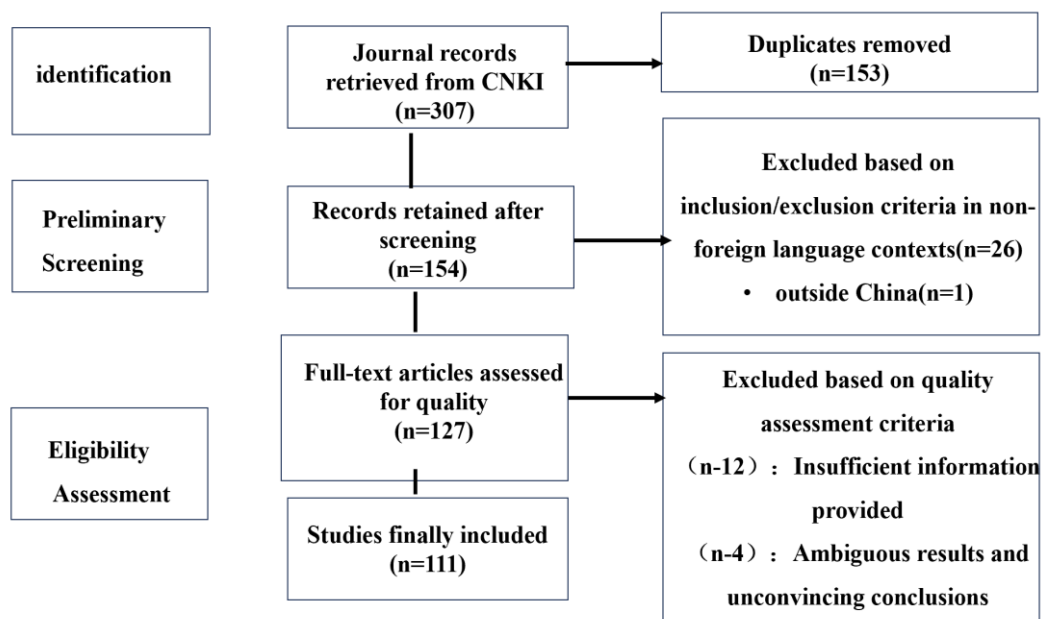


Figure 2. Literature Screening Flow Diagram for Ecological Affordance Theory in the Field of Domestic Foreign Language Education

The first stage was literature search and identification. This stage aimed to identify alternative search strategies to locate relevant literature for inclusion in the systematic review. The search terms "ecological affordances," "affordances theory," and "positive affordances" were used, with the scope limited to journals closely related to ecological affordances theory in foreign language education. The publication timeframe was set from 2015 to 2025.

The second stage involved preliminary screening. Using the advanced search function of CNKI, this study retrieved articles from domestic Peking University Chinese Core Journals and international journals indexed in SSCI and AMI. Specifically, the search was conducted with the thematic keywords "ecological affordances," "affordances theory," and "positive affordances," resulting in 306 relevant articles. These results were imported into CNKI Research in .es6 format to remove duplicates. The literature search was completed on September 20, 2025.

The third stage was eligibility assessment of the literature. From the preliminary screening, 307 articles related to ecological affordances in foreign language education were identified. After manually removing duplicates (n = 153), 154 articles remained. To further refine the selection, the titles and abstracts of the articles were examined and evaluated. Only research papers employing quantitative, qualitative, or mixed methods were included. The exclusion criteria omitted books, book series, and conference proceedings. After a comprehensive assessment, 111 relevant articles were ultimately identified.

3.FINDING AND DISCUSSION

3.1 Overall Trends

Figure 3 illustrates the research trends and annual publication output related to ecological affordance theory in China’s academic community over the past decade (2015–

2025). As an important theory originating from foreign linguistics and educational technology, its developmental trajectory within CNKI literature clearly reflects the entire process from introduction and assimilation to localized exploration and deepening. In terms of publication volume, with 2020 and 2023 as key turning points, research on ecological affordance theory can be broadly divided into three phases.

The first phase (2015–2019) marks the initial and preliminary development stage of ecological affordance theory research. During this period, the number of related publications showed a gradual upward trend, starting with only one article in 2015 and increasing year by year to five articles in 2018, followed by a slight decline to three articles in 2019. Overall, annual publication output remained low during this phase, indicating that research was still in an exploratory stage.

The second phase (2020–2023) represents a period of rapid growth in ecological affordance theory research. Starting in 2020, the number of related publications increased significantly, with 13 articles published that year and maintaining a similar level in 2021. Research interest continued to rise thereafter, reaching 18 articles in 2022 and peaking at 24 articles in 2023, forming the highest point of research activity in the past decade and indicating the theory's growing recognition in academia.

The third phase (2024–2025) is characterized by fluctuations and adjustments in research development. After a period of robust growth, the number of publications decreased to 18 in 2024, with only nine articles retrieved for 2025 (Note: Data for 2025 is incomplete). This fluctuating adjustment may suggest that research in this field is transitioning from "quantitative growth" to "qualitative deepening," as scholars engage in reflection and consolidation to pave the way for future theoretical innovation or interdisciplinary integration. It is foreseeable that future domestic research will increasingly focus on exploring underlying mechanisms in specific contexts and constructing innovative models.

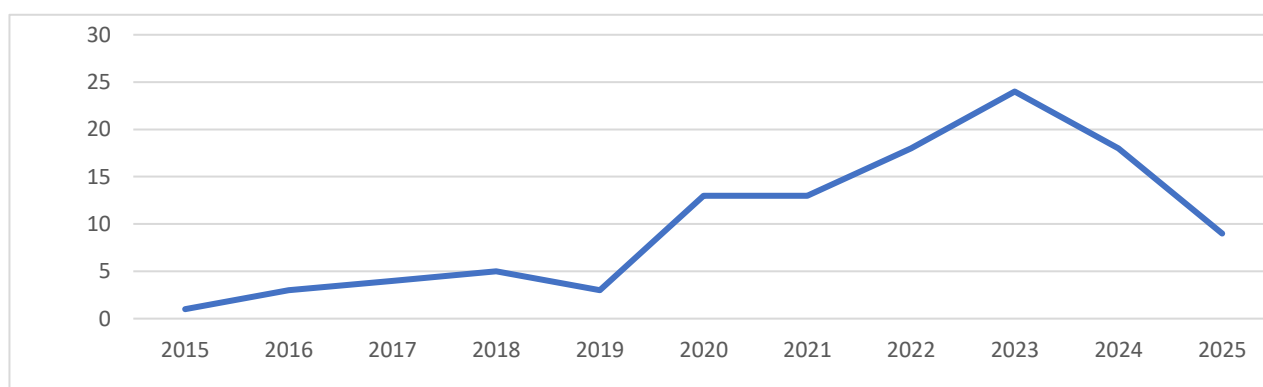


Figure 3. Annual Distribution of Publications on Ecological Affordance Theory in Foreign Language Education

3.2 Research Hotspots

Research hotspots refer to "issues commonly focused on by scholars within a specific research field, holding significant academic reference value in revealing the overall landscape of that field" (Dong et al., 2021). These can be identified through indicators such as keyword co-occurrence frequency and betweenness centrality (Zhang & Zhang, 2015). To systematically examine the research hotspots of ecological affordance theory

in China's foreign language education, this study employs CiteSpace (version 6.3.R2) as the core analytical tool. By setting "keywords" as network nodes and utilizing quantitative indicators such as keyword co-occurrence, frequency, and betweenness centrality, the study identifies and assesses the core topics and knowledge structure of this field. Furthermore, the "Bursts" detection function of the software is used to trace high-frequency burst keywords across different periods, revealing the dynamic evolution of research hotspots and providing a comprehensive judgment on the developmental trajectory of the field (see Figure 4).



Figure 4. Keyword Co-occurrence Knowledge Map of Ecological Affordance Theory

In Figure 4, each keyword is represented by a node, with the node size indicating the frequency of the keyword's occurrence. The lines between nodes represent co-occurrence relationships: thicker lines indicate stronger co-occurrence (Song et al., 2022). Table 1 is a statistical table of the "Top 10 Keywords by Frequency" created based on CiteSpace visual analysis. Among them, "ecological affordances," "affordances," "affordance theory," "college English," and "learning environment" are high-frequency keywords in the field of ecological affordances. "Ecological affordances" is the most frequently occurring keyword, appearing 29 times in the literature over the past decade, followed by "affordances," which appears 23 times. According to the statistics, high-frequency keywords such as "ecological affordances" and "affordances" directly reflect the importance of ecological affordances in foreign language learning.

In scientific knowledge mapping, betweenness centrality is used to identify "bridging" keywords that connect different research topics. These keywords may not necessarily have the highest frequency of occurrence, but they play a crucial mediating role in the network knowledge structure by linking multiple subfields (Ran et al., 2016). In CiteSpace analysis, nodes with a betweenness centrality exceeding 0.1 are considered key nodes, which directly indicate the importance of keywords and reveal research hotspots. According to CiteSpace analysis, the top 10 keywords by betweenness centrality are summarized (see Table 1). Among them, "ecological affordances" has the highest

betweenness centrality of 0.36, followed by keywords such as "affordances," "affordance theory," and "college English."

Table 1. Statistical Table of Top 10 Keywords by Betweenness Centrality

Serial Number	Keyword	Betweenness Centrality	Frequency	Serial Number	Keyword
1	Ecological Affordance	0.36	29	6	Positive Affordance
2	Affordance	0.4	23	7	Affordance Transformation
3	Affordance Theory	0.23	14	8	Affordance Perception
4	College English	0.15	14	9	High School English
5	Learning Environment	0.26	12	10	Negative Affordance

After conducting a summary and analysis of Figures 4, 5, and Table 1, these keywords can be categorized into conceptual clusters of ecological affordance theory, from which the following research hotspots can be distilled: 1) Studies on the connotation and theoretical origins of ecological affordances in China; 2) Studies on the dimensional classification and transformation of ecological affordances in China; 3) Studies on the practical exploration of ecological affordances in multi-context and multi-agent settings in China; 4) Studies on the expansion of ecological affordances into emerging technologies and cultural dimensions in China. A detailed elaboration follows below.

3.2.1 Studies on the Connotation and Theoretical Origins of Ecological Affordances in China

The introduction and definition of ecological affordance theory within China's linguistics community have evolved from pioneering importation to systematic construction. As a pioneer in the field, Qin (2015) was the first to systematically introduce Van Lier's ecological affordance theory into domestic Second Language Acquisition research. She emphasized its core connotation of "environment provision-individual perception-positive action," laying the foundation for the theory's localized study. Subsequently, research progressed towards deepening and systematization. Representative scholars such as Qin, He, and Ouyang (2020) contributed at the micro-level of classroom ecological affordances, particularly in constructing mechanisms for knowledge internalization. Xu and colleagues further dedicated efforts to constructing multidimensional interaction and affordance perception, focusing on the specific operational mechanisms of ecological affordances within interactive environments, especially learners' psychological perception (Xu et al., 2025). Recently, theoretical tracing and connotation interpretation have become more refined, marked by the seminal work of Qin and Xu (2025) in their article "Philosophical Roots, Disciplinary Attributes, and Research Status of 'Ecological Affordances' Theory in Second Language Acquisition." Their systematic review of the theory's philosophical foundations, core concepts, and historical development provides a solid meta-theoretical basis for its application and innovation in the domestic academic community.



Figure 5. Cluster Map of Ecological Affordance Keywords (LLR)

3.2.2 Studies on the Dimensional Classification and Transformation of Ecological Affordances in China

With the theoretical foundation solidified, the research focuses gradually shifted towards a detailed analysis of the inherent dimensions of affordances and their transformation mechanisms. Research at this stage aimed to deconstruct the psychological and social processes through which affordances transform from "latent environmental properties" into "individual learning actions." Cai's (2021) empirical study on the relationship between affordance perception and English learning engagement marked a shift in research focus from the external environment to learners' internal psychological mechanisms, profoundly revealing the core role of "perception" as a key node in the transformation process. Building on this, research further concentrated on micro-level classroom interactions. Zhang and Liu's (2024) qualitative case study on teacher feedback in empowered English classrooms meticulously depicted the complex process through which a single pedagogical affordance is differentially perceived, interpreted, and acted upon by learners in specific contexts. They identified multiple influencing factors such as learner individual differences and classroom atmosphere, greatly deepening the understanding of the contextual and complex nature of affordance transformation.

3.2.3 Studies on the Practical Exploration of Ecological Affordances in Multi-Context and Multi-Agent Settings in China

At the practical level, ecological affordance theory has demonstrated strong explanatory power and adaptability, being widely applied to diverse language teaching scenarios and forming a rich spectrum of empirical research. Early research focused on verifying the effectiveness of affordance transformation in information technology environments (He et al., 2019). Subsequently, the scope of exploration rapidly expanded to diverse contexts such as college English, vocational education, and Content and Language Integrated Learning. For instance, some studies, based on an ecological affordance perspective, analysed college English curriculum systems, examining the

affordance-providing characteristics of course modules and differences in students' perception and utilization of resources, proposing an optimization path centered on "affordance alignment" (Qin et al., 2024). These studies collectively focused on the interaction among multiple agents within specific environments, pushing the theory from macro-level concepts towards concrete practical solutions.

While expanding practical scenarios, the research perspective has increasingly focused on different agents within the teaching ecology, deepening the understanding of each role's agency in affordance transformation (He & Ma, 2025). On one hand, research has deeply investigated learners as the core agents of affordance perception and utilization, examining how individual factors (such as motivation, beliefs, language proficiency, etc.) mediate or moderate the ultimate realization of affordances (Zhu & Zheng, 2023). On the other hand, the role and function of teachers, as key designers of the learning environment and important providers of affordances, have also received widespread attention. Related research has explored how teachers, through instructional decisions, discourse strategies, and resource allocation (e.g., Zhou, 2025), consciously optimize affordance design within the learning environment to promote the effective transformation of potential affordances into real actions, reflecting a dynamic grasp of the interactive relationships among multiple agents within the teaching system.

3.2.4 Studies on the Expansion of Ecological Affordances into Emerging Technologies and Cultural Dimensions in China

Currently, the forefront of domestic ecological affordance research is actively moving towards deep integration with emerging technologies and expansion into macro-cultural dimensions, demonstrating forward-looking academic vision. Regarding technological integration, scholars represented by Xu have begun exploring points of convergence between ecological affordance theory and technologies like generative artificial intelligence. This foreshadows future research focusing on affordance design and practice under new paradigms of human-machine collaboration, revealing the novel learning affordances created by technological empowerment and their transformation mechanisms (Xu & Yang, 2025). Simultaneously, the theoretical boundaries are extending from the micro-ecology of the classroom to the macro-level of the education system and cultural dimensions. Regarding macro-level expansion of the educational ecology, Shu (2022) proposed that foreign language education is a complex ecosystem encompassing multiple layers such as government policies, social needs, and school practices. This theoretical framework provides a basis for cross-field analysis of ecological affordances. Qin et al. (2023) constructed a multi-agent, static-dynamic integrated framework for foreign language textbook evaluation. By incorporating multimodal content of curriculum ideological and political elements into the analysis and innovatively introducing multimodal critical discourse analysis and Q methodology, they achieved a systematic assessment of the affordance value of cultural resources. Chang and Yang's (2023) analysis based on CiteSpace knowledge mapping revealed that existing foreign language textbooks suffer from insufficient theoretical support and disconnection from dynamic practice. The introduction of ecological affordance theory was shown to offer a new path for resolving this dilemma. These theoretical expansions demonstrate the

unique interdisciplinary vitality and developmental prospects of ecological affordance theory.

3.3 Representative Authors

By examining the authors and affiliated institutions within the research literature of a specific field, we can analyze the social relationships among institutions and scholars in that research domain. This provides a new perspective for evaluating the academic influence of research institutions and personnel, facilitating the identification of institutions and researchers worthy of attention (Chen et al., 2015). Using CiteSpace software to analyze the authors in the selected 111 journal articles, a total of 134 authors (including first authors and co-authors) were identified. According to Price's Law, within a given research field, a majority of academic output is contributed by a small number of core researchers. Specifically, half of the publications in the field are produced by a number of authors corresponding to the square root of the total number of authors, allowing for an estimation of the number of core authors. Its mathematical expression is commonly written as: $N_c = \sqrt{Nt}$. Given that the selected literature includes a total of 134 authors (including first authors and co-authors), we can apply Price's Law to estimate the number of core authors:

$$N_c = \sqrt{134} \approx 11.576.$$

Thus, the number of core authors is approximately 12. This indicates that among the 134 authors, around 12 authors have contributed the majority of the academic output.

Table 2. Author Statistics

No.	Author	Frequency	No.	Author	Frequency
1	Qin Lili	10	7	Wu Fati	3
2	He Yanhua	7	8	Xu Jinfen	3
3	Shen Shujing	5	9	Li Tongtong	3
4	Ouyang Xibei	5	10	Zhang Xin	2
5	Yang Xianjian	5	11	Wang Siyao	2
6	Zhang Qiuling	3	12	Deng Junye	2

Using CiteSpace software to process the authors of the literature, a visualization map of author co-occurrence was generated, as shown in Figure 6.

From Table 2, it can be observed that Qin Lili and He Yanhua have published the most papers, with 10 and 7 publications respectively. Scholars such as Qin Lili, Xu Jinfen, Ouyang Xibei, and He Yanhua have collectively advanced the in-depth development of ecological affordance theory within the context of foreign language education in China. Qin Lili has made foundational contributions to the introduction and systematic construction of the theory; Xu Jinfen has developed a distinctive research focus on multi-dimensional interaction and learners' psychological perception; Ouyang Xibei and He Yanhua have achieved breakthroughs in exploring micro-level knowledge internalization mechanisms. Their research demonstrates characteristics of theoretical localization, methodological diversification, and micro-level perspectives, forming a complementary and mutually advancing landscape. Simultaneously, according to the author co-

occurrence map shown in Figure 6, the author group centered around Qin Lili, Xu Jinfen, Ouyang Xibei, and He Yanhua exhibits dense connecting lines, forming a stable collaborative network. Subgroups composed of scholars such as Yang Xianjian and Shen Shujing also exist. Research on ecological affordances in China's foreign language education has thus formed several representative teams. However, overall, research forces remain relatively dispersed, and a cohesive collaborative trend has yet to emerge. This situation reflects that the development of the academic community in this field is still in its early stages, urgently requiring institutionalized growth. To address this, it is necessary to integrate research efforts and optimize the academic ecology through measures such as establishing professional academic organizations, organizing thematic seminars, and creating dedicated sections in authoritative journals. Furthermore, scholars should be encouraged to ground their work in teaching practice, identifying and addressing core issues from authentic, dynamic cases. This will promote systematic and localized innovation in ecological affordance research for foreign language education and inject new theoretical vitality and practical momentum into the high-quality development of ecological affordance theory in Second Language Acquisition.



Figure 6. Author Co-occurrence Visualization Map

3.4 Publishing Institutions

CiteSpace software was used to visualize the literature data sources, and Table 3 presents the list of institutions affiliated with the authors, as shown below.

The results indicate that from 2015 to 2025, institutions producing a significant number of research outputs on "ecological affordances" include Dalian University of Foreign Languages, Shanghai International Studies University, Kaili University, Liaoning Normal University, Beijing Foreign Studies University, Beijing Normal University, Dezhou University, and Tianjin Normal University. In terms of institution types, foreign language universities constitute the main force in this research field, making prominent contributions to theoretical introduction and foreign language teaching application. Normal universities have expanded the application pathways of ecological affordance theory in instructional design and teacher development. The participation of some comprehensive universities and local application-oriented institutions provides a valuable supplement to the development of ecological affordance theory.

Further analysis, combined with the author collaboration network (Figure 6), reveals that institutional collaboration exhibits a "core-periphery" structure. Overall, collaboration between institutions remains relatively sparse, and a stable, extensive academic collaboration network has yet to form. This reflects the current practical issues of uneven distribution of research forces and low levels of resource integration.

Table 3. Institutions of Authors

No.	Institution	Publications	No.	Institution	Publications
1	Dalian University of Foreign Languages	10	6	Faculty of Education, Beijing Normal University	3
2	Shanghai International Studies University	7	7	School of Foreign Languages, Dezhou University	3
3	Kaili University	5	8	College of Education Science, Tianjin Normal University	3
4	Liaoning Normal University	4	9	Shaanxi University of Technology	2
5	Beijing Foreign Studies University	3	10	Central South University	2

Note: This table lists the institutions affiliated with the authors and their corresponding number of publications.

3.5 Research Trends

Keyword clustering reveals the overall research hotspots from 2015 to 2025. To further analyze the related research hotspot themes over the past decade, we utilized CiteSpace's timeline clustering function based on terminology to conduct a timeline cluster analysis of ecological affordance theory in the field of foreign language education over the last ten years. Figure 7 and Figure 8 display the development of the cluster timeline and the distribution of the top 14 burst terms, respectively.

As can be seen from the cluster timeline development in Figure 7 and the keyword bursts in Figure 8, the overall research revolves around themes such as "affordance," "identity," "autonomy," and "interaction." However, the general direction of the research varies across different time periods. Furthermore, as shown in Figure 8, "Year" indicates the year the keyword appeared, "Begin" marks the year the keyword started to burst, and "End" signifies the year the keyword burst concluded. "Strength" represents the intensity of the burst, with a higher value indicating a higher frequency of the keyword's occurrence. It is noteworthy that Figure 8 shows keyword burst intensities only became prominent starting in 2018.

Considering both Figure 7 and Figure 8, the overall trend reveals that "affordance" emerged in 2016, with its burst intensity reaching 3.15 during 2018-2019, making it the strongest burst keyword. This indicates that research related to "affordance" garnered significant attention during this period. Keywords like "identity" and "autonomy" appeared in 2018, began bursting in the same year, and continued until 2019, reflecting a high research interest in learner identity construction and learning autonomy during 2018-2019. In 2020, keywords such as "interaction," "English teaching," "agency," "foreign language teaching," "foreign language learning," and "affordance perception" appeared collectively. Their burst periods extended from 2020 into 2021-2022, demonstrating a post-2020 focus in foreign language teaching on the mechanisms of

"interaction," teaching "agency," different aspects of the "foreign language teaching/learning" process, and the perceptual dimension of "affordance." Keywords like "Activity Theory" in 2021, "Smart Classroom" and "Narrative Inquiry" in 2022, and "Affordance Transformation", which appeared in 2020 and remained in its burst period from 2023 to 2025, show the research gradually expanding towards theoretical tools (Activity Theory), technology-enabled teaching scenarios (Smart Classroom), qualitative research methods (Narrative Inquiry), and the dynamic transformation process of the "affordance" concept.

In terms of temporal distribution, from 2015 to 2025, research hotspots evolved from an early focus on core concepts like "affordance," "identity," and "autonomy," gradually extending to specific process elements in foreign language teaching (interaction, agency), technology-integrated teaching scenarios (smart classroom), the application of theories and methods (Activity Theory, Narrative Inquiry), and the deepening development of concepts (affordance transformation). This presents a trend shifting from a focus on core concepts towards multidimensional and multi-level deepened research.

Regarding research methods and perspectives, the evolution moved from discussing the concepts of "affordance" and "identity" themselves, to gradually incorporating the theoretical lens of "Activity Theory," the research method of "Narrative Inquiry," the technological context of "Smart Classroom," and conducting analyses of the dynamic process of "Affordance Transformation." This demonstrates a continuous enrichment and deepening of research in terms of theoretical support, methodological application, and practical contexts.

Overall, ecological affordance research in the field of domestic linguistics has formed a complete innovation chain, progressing from theoretical foundation to mechanism deepening, then to practical validation, and finally expanding towards future scenarios.

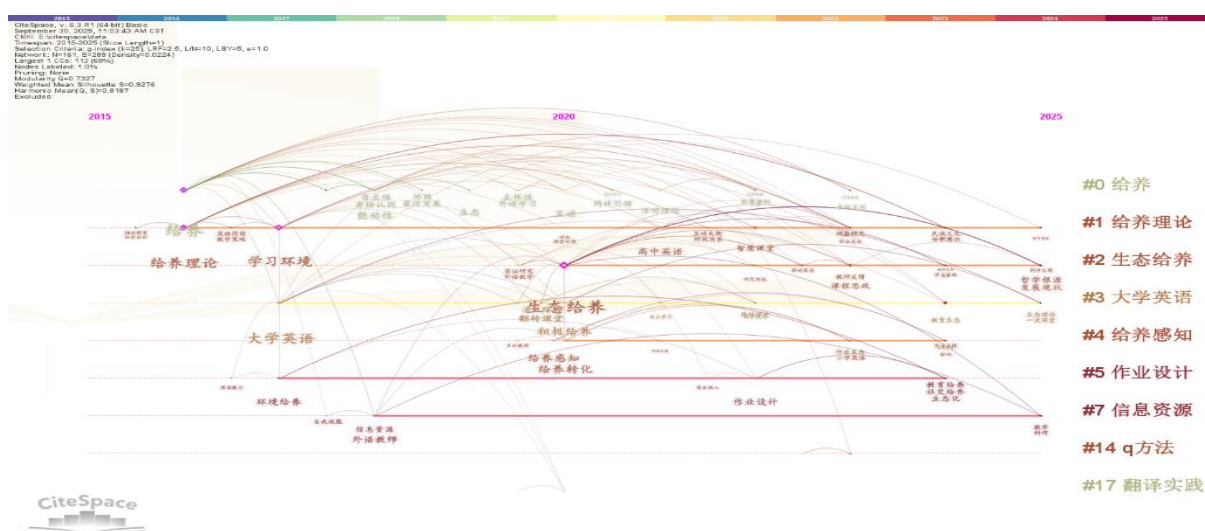


Figure 7. Analysis of Research Trends—Timeline

Top 14 Keywords with the Strongest Citation Bursts



Figure 8. Analysis of Research Trends—Keyword Bursts

4.CONCLUSION

Based on the database of China National Knowledge Infrastructure (CNKI) over the past decade (2015–2025), this paper conducts a statistical analysis of academic journals focusing on the ecological affordance theory in the field of foreign language education by employing the CiteSpace knowledge mapping software. Through the systematic organization of research findings, the conclusions are drawn as follows: 1) From an overall perspective, the development of this field has experienced considerable fluctuations in the past decade, exhibiting a generally upward trend coupled with the characteristics of periodic volatility, which can be roughly divided into three phases. 2) In terms of research hotspots, the primary focuses include: studies on the connotation and origin of ecological affordance theory in China; research on the dimensional classification and transformation mechanism of domestic ecological affordance; explorations into the multi-scenario and multi-agent practical application of ecological affordance in China; and studies on the expansion of ecological affordance theory into emerging technology and cultural dimensions in the domestic context. 3) Regarding representative scholars, the key contributors include Qin Lili, Xu Jinfen, Ouyang Xibei, He Yanhua, et al. 4) As for research institutions, those with prolific output of relevant academic achievements are: Dalian University of Foreign Languages, Shanghai International Studies University, Kaili University, Liaoning Normal University, among others. 5) In terms of research trends, domestic studies have primarily focused on the introduction and interdisciplinary application of the concept of affordance, providing theoretical insights and methodological guidance for college education and the instructional design of general education courses (Fan, 2025).

The domestic research on ecological affordance has undergone an evolutionary process, evolving from introduction and assimilation to localized innovation, from macroscopic construction to microscopic analysis, and from a single-perspective approach to multi-dimensional integration. Future research will continue to follow the path of technological empowerment, theoretical intersection, and empirical process

analysis, further revealing the complex and dynamic nature of the ecosystem of foreign language teaching and learning in the Chinese context. As evidenced by the research results, the overall development of this field presents a fluctuating upward trajectory, and the evolution of research hotspots reflects the holistic advancement of the research paradigm in this domain: the research focus has gradually shifted from the connotation tracing of theoretical ontology to the analysis of dimensional classification and transformation mechanism at the epistemological level, and further expanded to the practical verification of multi-scenario and multi-agent application at the methodological level, as well as the in-depth integration with emerging technologies and cultural dimensions. This dynamic evolutionary trajectory clearly indicates that domestic research on ecological affordance has transcended the early stage of theoretical introduction, and is moving towards a more in-depth and systematic development along the path of theoretical construction, empirical testing, and application expansion.

By systematically exploring the domestic ecological affordance theory, we can transcend the static and isolated analysis of teaching elements, and instead examine the phenomena of foreign language learning from the perspective of an interconnected and dynamic ecological holism. This provides a powerful theoretical lens for understanding and optimizing the interactive nature between learners and their environments, and offers crucial insights particularly for interpreting the complexity of language learning in technology-enabled environments and promoting the construction of an integrated "teaching-learning-assessment" ecosystem (Wang & Li, 2019). However, this study also indicates that the development of the academic community in this field remains relatively lagging, which is mainly reflected in the sparse collaborative network among research institutions and scholars, and the lack of a stable and close research collaboration mechanism. This current situation suggests that it is imperative to strengthen the construction of organized scientific research in the future. Through establishing professional academic organizations, holding regular thematic seminars, and setting up special columns in authoritative journals, we can effectively consolidate research forces, promote in-depth academic dialogue and knowledge innovation, and thus collectively propel the research on ecological affordance in China's foreign language education to a new height.

This study has several limitations: Firstly, in terms of data timeliness, the literature search was conducted up to September 2025, failing to fully incorporate the research achievements in the late period of the year, which may exert a certain impact on capturing the latest frontier developments. Secondly, regarding data sources, this research is mainly based on the CNKI database. Although it can effectively reflect the current situation of domestic research, it does not include broader international academic resources, which limits the comprehensiveness of the research conclusions. Thirdly, in terms of research methodology, this paper mainly relies on bibliometric analysis, lacking in-depth qualitative research or case analysis as a supplement. Future research can combine qualitative methods to conduct more in-depth verification and interpretation of the bibliometric results.

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