A CiteSpace-Based Scientometric Analysis of Translation Competence in Global Research

Liu Hongwei and Wei Hui Suan

Abstract – **In the context of increasing globalization and technological innovation, translation competence has become a central topic of inquiry in translation studies, encompassing not only linguistic knowledge but also cognitive, cultural, emotional, and technological dimensions. This study presents a comprehensive scientometric analysis of global research on translation competence using CiteSpace, based on 222 peer-reviewed articles retrieved from the Web of Science Core Collection (1992–2025). The search strategy included various terminologies to reflect the evolution of the concept across time. CiteSpace was used to conduct co-word analysis, co-citation analysis, and burst detection, revealing major research themes, intellectual evolution, and emerging trends. The findings identify five core themes: theoretical models of competence, translation pedagogy and evaluation, interdisciplinary integration, technology-assisted translation, and domain-specific competence (e.g., machine translation and audiovisual translation). Timeline visualization reveals three developmental phases: conceptual foundation (1992–2010), pedagogical expansion (2011–2018), and interdisciplinary technological integration (2019–2025). Burst detection highlights recent trends in translator training, translator education, and AI-human collaboration, alongside increased attention to motivation, beliefs, and competence acquisition. Highly cited references, such as those by Pym, Albir, Kiraly, and Göpferich, reflect the field's transition from static models to dynamic, process-oriented frameworks. This study contributes to translation studies by offering a data-driven overview of the evolution and diversification of translation competence research. It underscores the growing importance of interdisciplinary approaches, empirical validation, and technological adaptation in translator education and practice. The findings hold practical implications for curriculum development, policy design, and the integration of digital tools in translation training. As translation continues to operate within increasingly complex and multilingual environments, understanding its competence frameworks is essential for both academic inquiry and professional advancement.**

Keywords –**CiteSpace，Translation competence, scientometric, core theme, developmental phase, trend**

I. INTRODUCTION

Translation competence, often regarded as a cornerstone of translation studies, refers to the set of skills, knowledge, and cognitive processes that enable an individual to produce accurate, effective translations.

The concept has evolved significantly over the years, encompassing a broad range of cognitive, linguistic, and cultural dimensions that work together in the translation process (PACTE, 2003; Kiraly, 2000). Early theories of translation competence focused primarily on linguistic and grammatical accuracy, but more recent perspectives emphasize the need for translators to also possess a wide array of extralinguistic and intercultural skills, which are essential for rendering culturally appropriate and contextually sensitive translations (Gile, 2009; Nord, 2018).

The increasing global demand for translation services, fuelled by globalization, international trade, and the rise of digital communication, has prompted growing interest in the study of translation competence, both from theoretical and applied perspectives. As the complexity of translation tasks escalates, the ability to evaluate and measure translation competence becomes crucial, particularly for academic research, training programs, and professional practice (Baker & Saldanha, 2009). Researchers have proposed various models of translation competence, with the PACTE model (PACTE, 2003) and the "functional approach" (Nord, 2005) being among the most influential. These models generally distinguish between different components of competence, including linguistic, textual, cognitive, and cultural competencies, and stress the importance of a dynamic interplay among these elements.

In recent years, however, the field has witnessed an increasing emphasis on interdisciplinary approaches that draw from fields such as cognitive science, psychology, and sociolinguistics (Baker, 2018; Chen, 2020). This interdisciplinary focus has expanded the boundaries of translation competence, incorporating cognitive and emotional factors, such as decision-making, problem-solving, and motivation, which influence the translator's performance (Gile, 2009; Kelly, 2005). Moreover, the integration of technology into translation practices—using machine translation, computer-assisted translation (CAT) tools, and translation memory systems—has led to new discussions on the evolving relationship between human translation competence and automated systems (O'Brien, 2012; Yamada, 2019). This has brought about new challenges in defining and measuring translation competence, as technology continues to reshape both the professional landscape and academic inquiry in translation studies (Baker, 2011).

Given these developments, it is important to take stock of the current state of research on translation competence. A scientometric analysis, which systematically maps the evolution of research through citation and co-citation analysis, can provide valuable insights into the intellectual structure of the field and identify emerging trends. Scientometric methods, such as those used in software tools like CiteSpace, allow researchers to visualize the growth of literature, detect key themes, and identify the major contributors in a field of study (Chen, 2006). CiteSpace has been effectively employed in various fields to examine the evolution of academic research and its intellectual trajectory (Liu et al., 2020). By using this tool to analyse a corpus of research publications on translation competence, this study aims to address the following three questions:

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i. What are the main themes in the study of translation competence?
ii. How did research on translation competence evolve over time?
iii. What are the emerging trends in the field of translation competence?

This study builds on previous scientometric analyses in the field of translation studies, which have highlighted important shifts in research focus, such as the integration of cognitive models of translation (Bouzidi et al., 2017) and the exploration of professional translation competence (Saldanha, 2018). However, there remains a lack of comprehensive studies that examines the full breadth of translation competence research over time, particularly in the context of global academic production based on Wos core collection.

The significance of this research lies not only in its ability to provide a comprehensive mapping of the field but also in its potential to guide future research directions and inform translation training and education programs. By uncovering the major research gaps and key areas of innovation, this study aims to contribute to the ongoing development of translation competence theory and practice. Furthermore, understanding the evolution of translation competence research is critical for shaping future curricula and research priorities in translation studies, especially in the light of the increasing role of technology in translation practice.

This paper is structured as follows: Section II deals with the specific problem statement, Section III provides a detailed review of the literature on translation competence, highlighting the major theories and models that have shaped the field. Section IV outlines the methodology, including the data collection process and the scientometric analysis using CiteSpace. In Section V, the findings of the scientometric analysis are presented, followed by a discussion of the implications of these findings in Section VI. Finally, Section VII offers suggestions for future research and concludes the paper.

II. PROBLEM STATEMENT

Translation competence is an evolving and multifaceted construct that has gained significant attention within translation studies. While extensive research has been conducted to conceptualize and define translation competence, many gaps remain in understanding its full scope, particularly when considering the integration of interdisciplinary factors such as cognitive science, psychology, and technology. Existing models of translation competence, such as the PACTE model (PACTE, 2003) and the "functional approach" (Nord, 2005), have made valuable contributions, but they often fall short in addressing the complexities brought about by the digital age and the interdisciplinary nature of modern translation practice. Furthermore, the rapid technological advancements in the field, especially in machine translation (MT) and computer-assisted translation (CAT) tools, have brought new challenges in defining and measuring translation competence. These technologies, while improving efficiency, have also raised questions about the evolving relationship between human translators and automated systems.

Despite the growing body of research, a comprehensive analysis of the state of translation competence research, particularly its global evolution and the emerging interdisciplinary trends, remains under-explored. Previous scientometric analyses, such as those by Bouzidi et al. (2017) and Saldanha (2018), have focused on specific aspects of translation competence, such as cognitive models or professional competence, but they have not provided a holistic view of the field's intellectual trajectory. Additionally, while CiteSpace has been used to examine the evolution of research in various fields (Chen, 2006; Liu et al., 2020), no study to date has employed this tool to map the evolution of translation competence research globally, particularly using the WoS (Web of Science) Core Collection database.

This gap in the literature presents a significant challenge for both researchers and practitioners in the field of translation studies. Without a comprehensive understanding of how translation competence has evolved, it becomes difficult to assess the effectiveness of current models and approaches, or to anticipate future trends in translation research and practice. Moreover, the lack of a unified framework for measuring translation competence that accounts for technological advancements and interdisciplinary contributions hinders the development of educational curricula, professional training programs, and policy-making in translation-related fields.

Therefore, the problem addressed in this study is twofold: first, there is a lack of a comprehensive scientometric analysis of translation competence research that considers the evolution of the field over time; second, the existing models and frameworks for translation competence fail to fully capture the impact of interdisciplinary contributions and technological advancements in translation practice. To fill this gap, this study aims to provide a systematic and comprehensive mapping of the literature on translation competence through a scientometric analysis using CiteSpace, focusing on the key themes, intellectual evolution, and emerging trends in global research.

III. LITERATURE REVIEW

This section synthesizes foundational and contemporary research on translation competence frameworks. Together with researches on scientometric analysis, it offers critical insights into how the field has historically addressed—or overlooked—the complexities now shaping its future.

Translation Competence

Translation competence, a critical concept in the field of translation studies, refers to the cognitive, linguistic, and cultural skills that enable translators to perform effective and accurate translations (PACTE, 2003; Kiraly, 2000). The evolution of translation competence theory has significantly broadened the scope of translation studies, moving beyond the focus on linguistic and grammatical accuracy to include a comprehensive set of cognitive and extralinguistic factors (Gile, 2009; Nord, 2018). Early models of translation

competence, such as the PACTE model (PACTE, 2003), emphasized the importance of linguistic and textual knowledge, while more recent models have incorporated cultural competence and cognitive processes, including decision-making, problem-solving, and the capacity to adapt to various contexts (Nord, 2005; Gile, 2009).

The conceptualization of translation competence has further expanded with the incorporation of interdisciplinary perspectives, drawing from fields such as cognitive science, psychology, and sociolinguistics. Researchers have increasingly focused on understanding the mental processes involved in translation, including how motivation, emotional states, and cognitive control influence translation performance (Baker, 2011; Kelly, 2005; Chen, 2020). These developments highlight the growing complexity of translation competence, which now encompasses not only the cognitive and linguistic dimensions but also the emotional and motivational factors that affect the translator's ability to render meaning accurately and appropriately.

Additionally, the increasing role of technology in translation practice has introduced new challenges and discussions about the relationship between human translation competence and automated tools such as machine translation (MT) and computer-assisted translation (CAT) tools. These tools have significantly altered the landscape of translation practice and have implications for the ways translation competence is defined and measured (O'Brien, 2012; Yamada, 2019). As translation technologies continue to evolve, they present new opportunities and challenges in the assessment and development of human translation competence, requiring a rethinking of traditional models and approaches to translation training and evaluation.

Scientometric Analysis in Translation Studies

As the field of translation competence continues to grow and evolve, it is essential to systematically examine the body of research that contributes to its development. Scientometric analysis, particularly using tools like CiteSpace, provides a robust methodology for mapping the intellectual structure of a field, tracking the evolution of key themes, and identifying emerging research trends. Scientometric methods rely on citation and co-citation analysis to visualize the relationships between scholarly publications, providing valuable insights into the intellectual trajectory of a field (Chen, 2006).

CiteSpace, a widely used scientometric tool developed by Chen (2006), is specifically designed to analyze citation patterns and to identify the major contributors and themes within a research field. The software's ability to visualize citation and co-citation networks allows researchers to detect key clusters of research, the evolution of these clusters over time, and the intellectual development of a particular domain. CiteSpace's application in bibliometric and scientometric studies has proven invaluable in disciplines ranging from information science to social sciences, offering a clear, data-driven picture of how academic research evolves and where future developments are likely to occur (Liu et al., 2020; Chen, 2006).

In translation studies, CiteSpace has been employed to track the evolution of research trends, identify pivotal authors and articles, and explore the growing intersection of translation studies with other fields such as cognitive science and technology (Bouzidi et al., 2017; Saldanha, 2018). For example, Liu et al. (2020) used CiteSpace to map the intellectual structure of translation studies, uncovering the key areas of focus, such as cognitive models of translation and the integration of technology in translation practices. These studies have provided valuable insights into the intellectual evolution of the field and have highlighted significant shifts in research priorities.

By applying CiteSpace to analyze the body of research on translation competence, this study seeks to offer a comprehensive overview of the field's development. Through citation and co-citation network analysis, this study aims to identify the main themes in translation competence research, trace how these themes have evolved over time, and highlight emerging trends that may shape the future of the field. As the translation competence landscape is increasingly shaped by technological advances and interdisciplinary approaches, using a tool like CiteSpace is crucial for understanding the complexities and ongoing developments in this area of study.

Gaps in the Literature

Despite significant progress in the study of translation competence, there remains a need for comprehensive scientometric studies that map the full evolution of research in this domain, particularly in the context of global academic production. Previous studies have focused on specific aspects of translation competence, such as cognitive models (Bouzidi et al., 2017) or professional competence (Saldanha, 2018), but there is a lack of studies that provide a holistic view of the field's development over time, especially when drawing on large-scale data sources like the Web of Science Core Collection.

By using CiteSpace to conduct a scientometric analysis, this study aims to fill this gap by providing a detailed, quantitative assessment of the key themes, influential authors, and evolving trends in translation competence research. The results of this analysis will offer valuable insights into the current state of the field, identify key areas for future research, and inform the development of translation competence theory and practice.

IV. METHOD

Data Collection

For this scientometric analysis, data was sourced from the Web of Science Core Collection, which provides access to a wide range of peer-reviewed academic literature. A comprehensive search was conducted using a specific query to capture relevant articles on translation competence. The search query was structured as follows:

(((((((TS=("translation competen*")) OR TS=("translation abilit*")) OR TS=("translation proficiency")) OR TS=("translation skill*")) OR TS=("translator competen*")) OR TS=("translator abilities ")) AND DT=(Article OR Review)) AND LA=(English)

The query was designed to include various terminological forms of "translation competence", such as "translation ability", "translation skill", and "translator

competence". This approach was intentional to capture the different terminologies used over time as the field evolved. Earlier studies often used terms like "translation ability" or "translation skill", while more recent research has used "translator competence" or "translator abilities" (Baker & Saldanha, 2009; PACTE, 2003). The use of different terms reflects the evolution of the concept, which has expanded to encompass cognitive, linguistic, and cultural dimensions (Gile, 2009; Nord, 2018).

The query was refined to include only articles and reviews, while excluding document types like Early Access, Retracted Publications, Proceeding Papers, and Book Chapters to ensure the focus remained on peer-reviewed journal articles and comprehensive reviews. Further refinement was made by selecting publications categorized under Language Linguistics, Linguistics, and Educational Research to ensure the dataset was relevant to the core themes of translation competence.

Initially, the search returned 513 articles. However, after manually reviewing the results and excluding those deemed less relevant to the research focus, 222 articles were selected for inclusion. The time frame for the analysis was determined based on the final dataset of articles, which spanned from 1992 to 2025 as is shown in Fig. 1. This period was selected to reflect the evolution of research on translation competence and ensure the dataset included the most relevant studies within this timeframe.

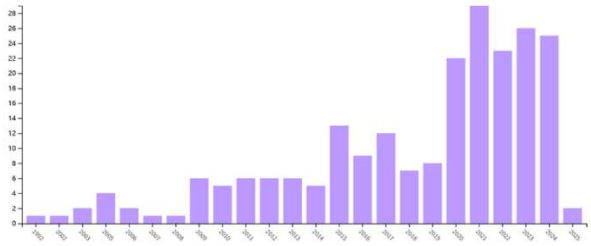

Figure 1: The distribution of the 222 records from 1992 to 2025

The articles were exported from the Web of Science in plain text format, containing “full records and cited references”. This dataset was then prepared for analysis using CiteSpace.

Visualization and Analysis

The dataset was visualized and analyzed using CiteSpace version 6.3.1R, a scientometric analysis tool developed by Chen (2006). CiteSpace supports various types of bibliometric analysis, such as co-word analysis, document co-citation analysis, author co-citation analysis, and burst detection. This study focused on co-word analysis, document co-citation analysis, and burst detection, to identify the key themes, intellectual structure, and emerging trends in the global research on translation competence.

In the first step, co-word analysis was conducted to reveal the major themes within translation competence research. Co-word analysis identifies frequently co-occurring keywords across multiple documents (Si et al., 2019), enabling the construction of keyword co-occurrence networks. These networks highlight the conceptual structure of the field. Keyword clusters, generated by CiteSpace based on co-occurrence patterns, reflect semantically related research topics. For label extraction, the log-likelihood ratio (LLR) algorithm was used, which is recommended for producing distinctive and meaningful cluster names (Chen et al., 2010). This approach allowed for the identification of dominant research foci such as translation competence, machine translation, and translator training.

In the second step, to explore the knowledge evolution of the field, document co-citation analysis was carried out. This method constructs a network of references that are frequently cited together, forming an intellectual map of influential studies within the domain (Chen, 2017). CiteSpace provides multiple visualization formats for this analysis, including cluster view, timeline view, and time zone view. In the current study, the timeline view was adopted, which displays how clusters of co-cited documents evolve chronologically, allowing the researcher to trace the historical development of core research areas and observe their relative prominence over time.

Subsequently, burst detection of both keywords and cited references was conducted to identify emerging research trends. Burst detection is a method used to detect sudden increases in term usage or citation frequency, indicating the emergence of new topics or intellectual turning points (Kleinberg, 2002; Chen, 2006). In this study, both keyword bursts and citation bursts were analysed. The strongest bursts reflected rising attention to concepts such as translation pedagogy, translator education, and machine translation. To further understand these developments, the citing articles related to burst terms were examined, providing contextual insight into the field’s evolving research priorities.

This three-step approach—co-word analysis, co-citation analysis, and burst detection—enabled a comprehensive examination of the structure, dynamics, and frontier topics in translation competence research across time.

V. FINDINGS

This section presents the findings from the scientometric analysis of global research on translation competence between 1992 and 2025, using co-word analysis, keyword clustering, document co-citation analysis, timeline visualization, and citation burst detection. The results are organized into three parts: thematic structures, knowledge evolution and emerging trends in accordance with the three questions in Introduction section.

Thematic Structures in Translation Competence Research

To examine the key research themes, co-word analysis (see Fig.2) and keyword clustering were conducted. The co-occurrence keyword network reveals (see. Fig.3) that translation competence is the most prominent keyword, with the highest centrality (0.69) and frequency of 74. Other high-centrality keywords include competence (0.14), translator competence (0.14), education (0.12), and translator training (0.11), reflecting sustained attention to both theoretical and pedagogical dimensions of competence.

No.	Centrality	Keywords	No.	Centrality	Keywords
1	0.69	translation competence	9	0.05	machine translation
2	0.14	competence	10	0.04	corpora
3	0.14	translator competence	11	0.04	acquisition of translation competence
4	0.12	education	12	0.04	translation process research
5	0.11	translator training	13	0.04	acquisition
6	0.07	translation problems	14	0.03	translation process
7	0.06	chinese	15	0.03	cognitive apprenticeship
8	0.05	medical translation	16	0.03	translation teaching

Figure. 2: Top 16 Strongest Centrality Keywords

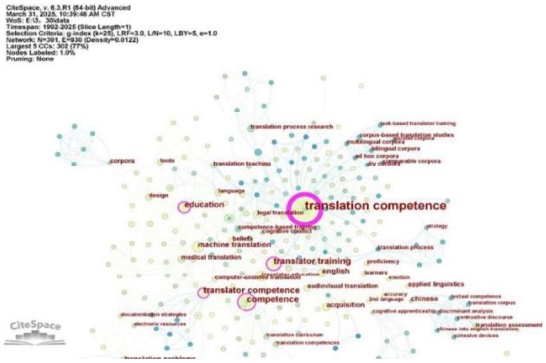

Figure. 3: Co-word citation

The network's centrality distribution highlights translation competence as the disciplinary nucleus, structurally reinforced by its direct conceptual ties to competence (0.14), translator competence (0.14), and pedagogical keywords like education (0.12) and translator training (0.11). These high-centrality nodes form a cohesive theoretical framework dominating discourse, while mid-range centrality terms such as translation problems (0.07) and Chinese (0.06) signal persistent foundational inquiries and regional specializations. Domain-specific applications emerge through technical clusters like medical translation (0.05) and machine translation (0.05), though their relatively moderate centrality positions them as peripheral extensions rather than core concerns. Lower-centrality terms reveal critical asymmetries: process-oriented concepts like translation teaching (0.03) and cognitive apprenticeship (0.03) exhibit weaker systemic integration despite their pedagogical relevance, while acquisition (0.04) and acquisition of translation competence (0.04) demonstrate fragmented conceptual links to the competence paradigm. The sparse connectivity of corpora (0.04) underscores incomplete methodological synthesis between data-driven approaches and mainstream theoretical models. Notably, the network's periphery—marked by near-marginal centrality values—exposes underdeveloped intersections, such as the weak bridging of ethical considerations with cognitive processes, suggesting uncharted territory in mapping translator agency within sociotechnical systems.

Next, keyword clustering using the log-likelihood ratio (LLR) algorithm identified nine dominant thematic clusters (see Fig.4), i.e. translation competence, machine translation, translator training, second language acquisition, writing skills, translation learning, applied linguistics, translation problems and evaluation. These clusters, based on the strength and frequency of keyword co-occurrence, represent the primary directions in translation competence research and reveal a hierarchical conceptual architecture within translation competence research.

The translation competence cluster (#1) centers on theoretical frameworks, encompassing terms like competence models and acquisition of translation competence. However, it predominantly emphasizes static models rather than dynamic processes, such as metacognitive strategies or technological integration. Machine translation (#2), while robust in technical keywords like neural machine translation and post-editing tools, remains isolated from pedagogical or ethical discourse, highlighting a divide between technological innovation and humanistic training paradigms. Translator training (#3) focuses on traditional methodologies (e.g., curriculum design, task-based learning), with limited engagement with emerging trends like digital literacy or technological competence, indicating a lag in pedagogical adaptation.

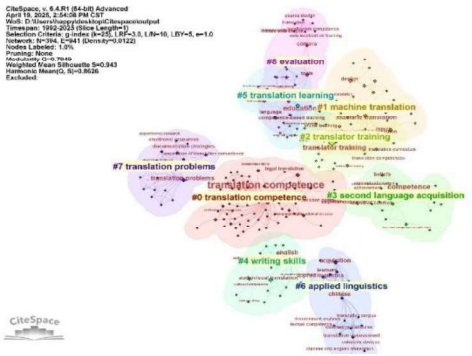

Figure. 4: Co-word cluster

Second language acquisition (#4) explores the intersection of bilingual proficiency and translation skills, emphasizing terms like L2 translation and bilingual sub-competence. Yet, it overlooks deeper cognitive and sociocultural interactions, such as bilingual language processing or cultural awareness. The writing skills cluster (#5) prioritizes textual mechanics (e.g., discourse markers, cohesive devices) but neglects advanced competencies like creative rewriting or AI-assisted drafting. Translation learning (#6), though incorporating cognitive theories like cognitive apprenticeship, lacks systematic integration of practical mechanisms (e.g., error analysis) or affective factors (e.g., emotion), revealing a superficial engagement with cognitive depth.

Applied linguistics (#7) leans on traditional subfields (e.g., contrastive pragma linguistics, functional approach) but shows weak ties to modern computational or sociolinguistic approaches. Translation problems (#8) predominantly address linguistic challenges (e.g., translation errors, cultural distance) while ignoring technology-driven issues like AI-generated inaccuracies or ethical dilemmas. The evaluation cluster (#9) aggregates assessment-related terms (e.g., assessment criteria, empirical-experimental methods) but struggles with fragmented methodologies and limited adoption of automated metrics.

These clusters confirm that research in this domain is increasingly characterized by interdisciplinarity, linking translation studies with cognitive science, education, and digital technology.

Knowledge Evolution in Translation Competence Research

To explore intellectual development over time, timeline visualization (see Fig.5) and citation analysis were employed. Co-cited references with strongest bursts (see Fig.6) were mapped to determine shifts in theoretical foundations and research focus.

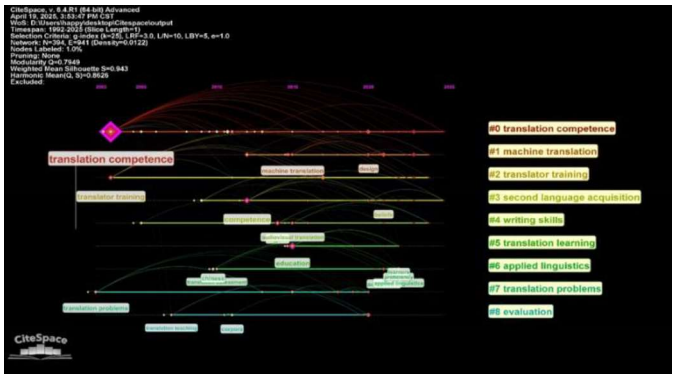

Figure. 5: A Timeline Visualization of 9 Major Co-Word Clusters

Top 10 References with the Strongest Citation Bursts

No.	References	Year	Strength	Begin	End	1992 - 2025
1	Albir AH, 2018, INTERPRET TRANSL TRA, V12, P111	2018	5.46	2020	2022	
2	Beeby A, 2011, BENJAMIN TRANSL LIB, V94, P317	2011	3.06	2015	2016	
3	Arenas A Ge, 2019, THE JOURNAL OF SPECIALISED TRANSLATION, V31, P217	2019	3.01	2021	2025	
4	Kiraly D, 2015, TRANSL INTERPRET STU, V10, P8	2015	2.91	2019	2020	
5	Albir A H, 2017, RESEARCHING TRANSLATION COMPETENCE BY PACTE GROUP, V0, P0	2017	2.8	2019	2020	
6	Gopferich S, 2009, COPENHAGEN STUDIES IN LANGUAGE, V37, P11	2009	2.79	2010	2013	
7	Albir AH, 2020, INTERPRET TRANSL TRA, V14, P95	2020	2.67	2023	2025	
8	Albir AH, 2015, META, V60, P256	2015	2.48	2017	2020	
9	Beeby A, 2015, TRANSL SPACES, V4, P29	2015	2.45	2018	2019	
10	Kockaert HJ, 2017, J SPEC TRANSL, V9, P148	2017	2.15	2020	2021	

Figure. 6: Top 10 References with the Strongest Citation Bursts

Based on the timeline of the key clusters and analysis of the references with the strongest citation bursts, three main phases of knowledge evolution were observed:

Early foundational phase (1992–2010): Basic translation problems and key theoretical frameworks were developed in this period. Pym's (2003) minimalist approach and Beeby et al.'s (2005) methodological investigations laid the groundwork for competence-based studies. Göpferich & Jääskeläinen (2009) introduced process research methodologies, while Albir (2007) emphasized competence-based curriculum design.

Expansion and pedagogical refinement (2011–2018): This phase saw the rise of empirical research into acquisition and training. Kiraly's (2015) constructivist model and Albir's (2015, 2018) competence levels and assessment criteria advanced the pedagogical discourse. Cited references during this period also addressed machine translation competences (Gaspari et al., 2015), further bridging technology and training.

Integration and diversification (2019–2025): Recent studies reflect a broadened interest in motivation, emotional factors, and professional practice. Notably, clusters on machine translation, audiovisual translation, and translator education became more active during this phase. This reflects a transition from purely conceptual discussions to applied, interdisciplinary frameworks with strong educational and technological underpinnings.

These phases demonstrate how the field has evolved from defining competence to implementing strategies for its development and integration into real-world contexts. It saw the rise of empirical research into acquisition and training. Kiraly's (2015) constructivist model and Albir's (2015, 2018) competence levels and assessment criteria advanced the pedagogical discourse. Cited references during this period also addressed machine translation competences (Gaspari et al., 2015), further bridging technology and training.

Emerging Trends in Translation Competence Research

The burst detection analysis reveals dynamic shifts in research priorities over time, highlighting emerging trends and sustained interests in translation competence studies. In this study, the burst of key words is detected and visualized (see Fig.7) by CiteSpace.

No.	Keywords	Year	Strength	Begin	End	1992 - 2025
1	competence	2012	2.43	2019	2020	
2	education	2015	2.05	2019	2022	
3	acquisition	2021	1.91	2021	2022	
4	translation pedagogy	2011	1.85	2011	2012	
5	translator education	2015	1.65	2023	2025	
6	medical translation	2017	1.64	2017	2019	
7	machine translation	2015	1.47	2021	2025	
8	design	2020	1.4	2020	2023	
9	beliefs	2021	1.3	2021	2023	
10	empirical-experimental research	2005	1.24	2005	2009	
11	translation process	2003	1.22	2003	2009	
12	literary translation	2009	1.17	2009	2011	
13	translator training	2003	1.14	2022	2025	
14	experimental research	2019	1.13	2019	2020	
15	audiovisual translation	2015	1.08	2021	2025	
16	computer-assisted translation	2015	1.07	2015	2020	

Figure. 7: Top 16 Keywords with the Strongest Citation Bursts

The dataset identifies 16 keywords with significant burst strength (≥1.0) across a 20-year span (2003–2025). Key metrics include:

Highest Burst Strength: competence (2.43, 2019–2020), education (2.05, 2019–2022).

Longest Active Bursts: machine translation (2021–2025), audiovisual translation (2021–2025), translator training (2022–2025).

Emergent Bursts: acquisition (2021–2022), beliefs (2021–2023), design (2020–2023).

Historical Bursts: translation process (2003–2009), literary translation (2009–2011), empirical-experimental research (2005–2009).

Based on burst intensity and temporal distribution, three major trends dominate the field's recent evolution:

First Technological Integration and Specialization (2021–2025)

Machine Translation (burst strength 1.47, 2021–2025): The sustained prominence of machine translation aligns with advancements in neural networks (e.g., neural machine translation) and industry demands for automation. Burst overlaps with computer-assisted translation (2015–2020) signal a shift toward hybrid workflows combining AI and human expertise.

Audio-visual Translation (1.08, 2021–2025): Rising interest in multimedia localization (e.g., subtitling, dubbing) reflects global digital content consumption trends. This cluster intersects with design (1.4, 2020–2023), emphasizing user-centric localization strategies.

Domain-Specific Translation: Medical translation (1.64, 2017–2019) laid groundwork for later specialization bursts

(e.g., legal translation implied by related terms), though current focus leans toward technical tools over ethical or cognitive dimensions.

Second Pedagogical Innovation and Cognitive Turn (2019–2025)

Translator Education (1.65, 2023–2025): The burst underscores a paradigm shift toward competency-based curricula, integrating online teaching (implied by design) and technological competence. Weak ties to cognitive apprenticeship (historical term) suggest untapped potential for embedding metacognitive strategies.

Acquisition (1.91, 2021–2022): This burst highlights renewed focus on skill development mechanisms, particularly acquisition of translation competence. However, limited overlap with empirical-experimental research (historical burst) indicates a need for methodological rigor in studying learning processes.

Beliefs (1.3, 2021–2023): Emerging interest in translator cognition, including attitudes toward technology (e.g., trust in machine translation) and self-efficacy, signals a nascent cognitive-affective turn.

Third Methodological Fragmentation and Reconsolidation

Empirical-Experimental Research (1.24, 2005–2009): While foundational, its historical burst contrasts with recent methodological diversification (e.g., experimental research, 1.13, 2019–2020). Current bursts like design (1.4, 2020–2023) suggest a pivot toward iterative, user-centred methodologies.

The resurgence of competence (2.43, 2019–2020) and education (2.05, 2019–2022) reflects efforts to reconcile legacy frameworks (e.g., translation pedagogy, 1.85, 2011–2012) with emergent technological realities.

The field of translation studies exhibits critical gaps that hinder holistic progress. First, an ethical-technological disconnect persists: despite rapid advancements in machine translation and audiovisual translation technologies, ethical considerations—such as ethical competence in decision-making—remain conspicuously absent from research and practice. This oversight risks embedding biases or ethical blind spots into AI-driven workflows. Second, a cognitive-operational divide undermines pedagogical frameworks: while concepts like language acquisition and translator beliefs surface in research, metacognitive strategies and emotional dimensions of learning lack attention, reflecting underdeveloped cognitive architectures in training models. Third, interdisciplinary silos limit innovation: high-activity clusters like medical or audiovisual translation operate in isolation from applied linguistics, cultural awareness, and competence models, stifling cross-domain collaboration. Burst analysis underscores a field in transition, where technological adoption and modernization of pedagogy dominate recent trends, yet foundational integration of ethical, cognitive, and interdisciplinary dimensions lags.

Future research must bridge these gaps through targeted priorities. Ethical AI integration should anchor advancements, embedding moral reasoning frameworks into the development, training, and evaluation of machine translation systems to mitigate risks of unethical outcomes. Simultaneously, cognitive-pedagogical synergy demands merging language acquisition studies with metacognitive and affective frameworks to cultivate adaptable, self-aware translators. Finally, cross-domain bridging is essential: aligning specialized domains (e.g., medical translation) with broader linguistic, cultural, and competence models will foster interdisciplinary innovation. By addressing these priorities, the field can transition from fragmented growth to cohesive, ethically grounded, and cognitively robust advancement.

VI. DISCUSSION

The scientometric analysis of global research on translation competence from 1992 to 2025 reveals a dynamic and evolving field that has transitioned from conceptual exploration to pedagogical and technological integration. The findings of the keyword co-occurrence, clustering, citation bursts, and co-citation analysis collectively offer several insights into the structure, direction, and transformation of this domain.

Thematically, the field continues to be anchored in discussions of translation competence, but newer clusters such as machine translation, translator training, second language acquisition, and audiovisual translation suggest an increasing diversification of research interests. This confirms previous literature (e.g., Albir, 2015; Kiraly, 2015) that points to the necessity of contextualizing translation competence in an ever-evolving professional landscape. Notably, the inclusion of clusters related to writing skills, evaluation, and applied linguistics reflects a growing interdisciplinary engagement—one that draws from cognitive psychology, educational research, and digital linguistics.

The keyword citation bursts further underscore this disciplinary evolution. The strong bursts associated with competence, education, and acquisition in recent years highlight a shift toward empirical and pedagogical approaches in training and evaluating translators. Concurrently, the bursts in machine translation, design, and audiovisual translation indicate that digital transformation has become a central concern in modern translation studies. This aligns with O'Brien (2012) and Gaspari et al. (2015), who emphasize the increasing necessity to integrate translation technology education in translator training programs.

The timeline visualization confirms a three-phase knowledge development trajectory—beginning with the conceptual establishment of competence (1992–2010), moving toward pedagogical formalization and empirical validation (2011–2018), and finally entering a phase of interdisciplinary integration and digital expansion (2019–2025). This pattern not only supports previous work by Beeby et al. (2005) and Göpferich & Jääskeläinen (2009) but also aligns with current shifts toward outcome-based education (OBE) models and digital humanities frameworks.

Furthermore, the high centrality of keywords such as translator training and translation pedagogy reflects a sustained academic and practical interest in developing effective curricular interventions. These trends highlight the importance of aligning translator education with industry expectations, cognitive development, and motivational scaffolding—a point emphasized by recent research on value-expectancy models in translation learning contexts (Appianing & Van Eck, 2018).

Importantly, the co-citation analysis identified foundational works—such as Pym (2003), Albir (2015), and Kiraly (2015)—that remain central to the intellectual discourse, while the emergence of more recent studies in machine translation and competence evaluation point to new paradigmatic shifts.

In sum, the findings affirm the importance of developing more integrative models of translation competence that consider cognitive, motivational, and technological dimensions, and emphasize the increasing importance of interdisciplinary collaboration in translation research.

VII. CONCLUSION

This study employed a CiteSpace-based scientometric analysis to map the global research landscape on translation competence from 1992 to 2025. Through the analysis of 222 journal articles retrieved from the Web of Science Core Collection, the study identified central themes, knowledge development phases, and emerging trends in the field. The results indicate that translation competence research has undergone substantial evolution—from a theoretical construct to a multifaceted domain integrating pedagogy, psychology, and technology.

One of the key contributions of this study is the identification of thematic clusters and burst keywords that represent both foundational and cutting-edge concerns in the discipline. The integration of machine translation, audiovisual translation, and education technology with traditional concerns about competence and pedagogy reflects the adaptive and interdisciplinary nature of the field. These findings not only provide a comprehensive understanding of the past and present of translation competence research but also offer a roadmap for future inquiry.

Limitations

Despite its contributions, this study has several limitations. First, it only includes English-language journal articles indexed in the Web of Science, which may have excluded significant works in other languages or non-indexed publications. Second, while CiteSpace is a robust tool for visualizing scientific knowledge structures, its reliance on citation data means it may underrepresent emerging but yet uncited research. Finally, the clustering and burst analysis are influenced by algorithmic thresholds and parameters, which, while standardized, may still introduce interpretive biases.

Suggestions for Future Studies

Future research could expand this scientometric investigation by including additional databases such as Scopus, ERIC, and Google Scholar, or by conducting multilingual analysis to capture regional and linguistic diversity in translation studies. Moreover, a deeper qualitative analysis of key clusters and citation bursts could be conducted to uncover nuanced discourses behind the keyword trends. It is also suggested that further empirical studies focus on the intersection between motivation, critical thinking, and translation competence, particularly within the context of digital translation education and cross-cultural communication.

In conclusion, translation competence research is poised at an exciting juncture, with opportunities for theoretical advancement and practical impact. By continuing to explore its interdisciplinary dimensions and applying innovative research methodologies, scholars can contribute meaningfully to both the academic and professional translation communities.

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