

# Hotspots and Insights on Quality Evaluation of Study Tours: Visual Analysis Based on Bibliometric Methodology

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**Abstract**—In this paper, taking 474 articles about quality evaluation of study tours in Web of Science (WOS) database as the research object, quantitatively analyze them with the help of CiteSpace 6.3.R1 software and excel data statistics, and analyze the impact of the literature data, authors' cooperation network, issuing institutions, journal distribution, and keywords' co-occurrence, clustering, and emergence factors, combined with time interval in-depth analysis and prediction, so as to present the research results in the form of visualized knowledge map. The results of the study show that the field of quality evaluation of research and study tourism an interdisciplinary field involving innovative research with multidisciplinary integration. During the decade of 2015-2024, it has experienced three stages of starting and exploration (2015-2018), rapid growth and diversification (2019-2021), and adjustment and maturity (2022-2024). From the viewpoint of authors and issuing organizations, authors are mostly independent research and have not yet formed a clustering research network. Research hotspots from the theoretical system construction and model development, empirical analysis, gradually shifted to user behavior analysis and recommendation system research. The future tends to research on research and learning integration intelligent decision-making, research and learning industry economy, environmental tourism practice and risk management.

**Keywords**—Research tourism; tourism quality evaluation; visualization analysis

## I. INTRODUCTION

With the deep integration of the education sector and the tourism industry, study tours, as an innovative form of experiential activity, have begun to receive widespread attention worldwide [1]. This combination of educational purposes and tourism experiences not only provides participants with an opportunity to learn and explore in a real-world environment, enabling them to acquire knowledge and skills while traveling, but for tourist destinations, study tourism has also become an effective economic development tool [2-3]. By attracting learners of different ages and backgrounds, it increases the attractiveness of the destination, extends the length of stay of tourists, and drives the development of local catering, accommodation, transportation and other related industries, thus bringing significant economic benefits to the destination [4]. Therefore, study tourism not only enriches the connotation of education, but also injects new vitality into the tourism industry, and this win-win characteristic makes study tourism a hot area of common concern for both education and tourism [5].

However, due to the lack of uniform evaluation standards, quality evaluation of study tours has become a challenge that requires urgent attention from both academics and practitioners. The quality evaluation of study tours is crucial for enhancing the tourism experience and educational effectiveness. The development of this form of tourism not only enriches educational resources, improves the satisfaction of learners participating in study tours, and promotes the enhancement of knowledge and skills. At the same time, it injects new vitality into the tourism industry, helps the local tourism industry to build a richer and multi-level tourism brand image, and attracts more tourists. Therefore, an in-depth discussion of the quality evaluation of study tours is of great theoretical and practical significance for promoting the development of the educational tourism industry.

The framework of this paper is described as follows: Section II, "Research methodology" elaborates on the specific methods used for bibliometric analysis with CiteSpace software and Excel, including data sources and the data cleaning process. Section III, "Analysis process and findings," deeply analyzes the trends in literature publication, including the annual number of publications and publication curve trends in "III (A) Analysis of literature releases" and discusses three developmental stages in two subsections: "III (A) (1) Annual number of communications" and "III (A) (2) Trends in the issuance curve", the initial exploration phase, the rapid growth and diversification phase, and the adjustment and maturation phase. Subsequently, the "III (B) Analysis of literature authors" section explores the authors of the literature and the institutions publishing them, including "III (B) (1) Authors and issuing organizations" and "3.2.2 Author collaboration network" in two subsections. The "III (C) Distribution analysis of journals" section analyzes the distribution of journals, including "III (C) (1) Analysis of core journals" and "III (C) (2) Analysis of cited journals" in two subsections. Section IV, "Relevant analysis based on the field" reveals the research hotspots and the dynamic evolution trends of hot fields through keyword co-occurrence, clustering, and emergence analysis, including three subsections: "IV (A) Hot topic analysis," "IV (B) Analysis of hot areas" and "IV (C) Trend analysis of dynamic evolution" Finally, Section V, "Conclusion," summarizes the main findings of the research, discusses the limitations of the study, and provides an outlook on future research directions.

## II. RESEARCH METHODOLOGY

### A. Research Tools

CiteSpace is a multivariate dynamic visualization and analysis software developed based on Java language, which is capable of handling a large amount of transcription information and performing various analyses such as collaborative network, co-citation, keyword co-occurrence, and keyword clustering [6]. It also provides three advanced clustering analysis methods of Latent Semantic Analysis (LSI), Log Likelihood Ratio (LLR), and Mutual Information Algorithm (MI), which help users to identify potential themes and trends in research [7]. In this study, with the help of CiteSpace 6.3.R1 software application, this paper transforms the literature data in this field during the period of 2015-2024 into a knowledge graph so as to visualize the current status of research, research hotspots, and future trends in this research field.

In order to increase the accuracy of the study, this study quantifies the research scholars' research result publishing behavior, the interaction behavior between research scholars, and between research scholars and institutions in the research field, and uses standardized EXCEL data forms to summarize the statistics, and then uses the empirical data to analyze the state of research in the field.

### B. Data Sources

Literature from the Web of Science (WOS) database, which is recognized by authors worldwide for its authoritative academic citation index, was selected as the primary data source for this study. A set of keywords was carefully designed to ensure a comprehensive coverage of the relevant studies in the literature search. The main keywords include "educational tour", "tourism quality evaluation" and "study tour", which cover this study. ", covering the concept of this research field, quality evaluation dimensions, evaluation index system, educational effect and other aspects of the research [8]. Boolean logic operators such as "AND" and "OR" are also used to optimize the search strategy and improve the relevance and accuracy of the search results [9]. Considering that in-depth research needs to be supported by a sufficient amount of literature data and closely related to the development of research and study tourism, the search time range was set as 2015-2024, and 2,221 pieces of related literature were initially obtained by combining the search strategies of databases, types of literature, and language ranges.

### C. Data Cleansing

In order to ensure the objectivity and authenticity of the results of this study, a rigorous data cleaning process was carried out in this study before using the data. Literature with no direct relevance, low relevance, lack of keywords, authors, and other lack of key elements, as well as non-research literature such as duplicated, unreviewed, and scrapped manuscripts, news commentaries, interview reports, and so on, were eliminated [10]. After several rounds of data cleaning, 474 valid literatures with high relevance were finally obtained. For the screened valid literature, detailed data records were made in this paper, including information such as title, author, publication year, journal name, keywords and so on. This information will provide basic data support for the subsequent bibliometric analysis and help us to

show the research hotspots and development trends in this research field.

## III. ANALYSIS PROCESS AND FINDINGS

### A. Analysis of Literature Releases

1) *Annual number of communications:* In this study, a bar chart of literature publication was produced based on the year of publication and the annual publication quantity of 474 valid literatures. In terms of the number of annual publications, the research in this field shows a relatively obvious growth trend. In 2015, the number of relevant literature published was only 18, showing that the research in this field is still in its infancy. In the following years, the number of publications increased steadily, with 24 and 28 publications in 2016 and 2017, respectively, indicating that authors began to gradually focus on this field. Entering 2018, the number of publications decreased slightly to 24, with authors exploring new research methods or waiting for more empirical data. Starting from 2019, the number of publications increased significantly to 41, and this growth trend peaked in 2020 and 2021, with 71 and 80 publications, respectively, and the surge in the number of publications was related to the attention, exploration, and practice of research in this field in the field of global education. From 2022 onwards, the annual number of publications, although decreasing slightly from 76 to 46, remained overall at a high level [11]. This indicates that the heat of research in this field is not decreasing, and academic research authors are shifting to more in-depth empirical research on the existing research results, waiting for more practice cases to accumulate before summarizing and analyzing them. As shown in Fig. 1.

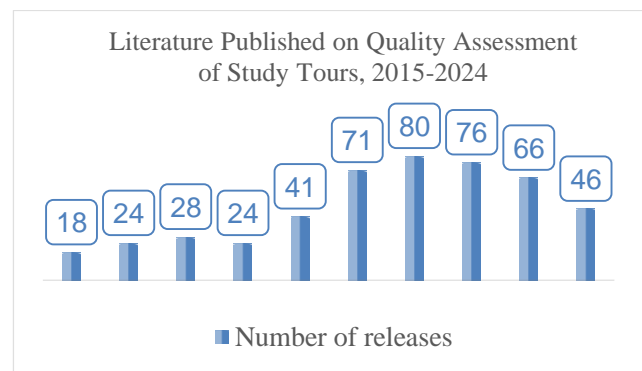


Fig. 1. Literature published, 2015-2024.

2) *Trends in the issuance curve:* The annual change in the number of literature publications shows the trend of research dynamics in this research area, which has shown a curvilinear growth over the past decade. In this paper, this period is broadly categorized into three phases: start and exploration, rapid growth and diversification, and adjustment and maturity.

Start-up and exploration phase: 2015-2018

In the early period of research in this field, i.e., 2015-2018, the annual number of literature publications increased from 18 to 24, showing a slow but steady growth trend, marking the

beginning and exploratory period of this field of research [12]. Research authors conducted preliminary discussions on the basic concepts, theoretical frameworks, and potential value of research tourism in the field of education during this period, with much of the research focusing on defining the connotations of research tourism, evaluating its educational efficacy, and exploring its comprehensive impact on learners [13]. These preliminary studies have laid a solid foundation for subsequent in-depth exploration, and despite the small number of publications, each of them is of great significance to the construction of a body of knowledge in this field.

#### Rapid Growth and Diversification Phase: 2019-2021

Entering 2019, research in this field began to receive wider attention, with a significant increase in the number of literature publications, reaching 41 in 2019 and climbing to a peak of 71 and 80 in 2020 and 2021, respectively. The rapid growth in this phase reflects the fact that the issue of quality evaluation of research tourism, as a new form of combining education and tourism, has begun to become a focus of attention in both academia and practice. Research scholars researchers began to explore diversified evaluation models and index systems, trying to assess the quality of study tours from different angles and levels [14]. The studies at this stage not only increase in number, but also present diversified characteristics in research methodology and theoretical depth, providing rich perspectives and profound insights for the research in this field.

#### Phase III: Adjustment and maturity phase (2022-2024)

From 2022 onwards, the number of publications within this research area decreased, with 76, 66 and 46 publications, respectively. This trend suggests that research scholars are beginning to consolidate and reflect on existing research findings after experiencing rapid growth in the previous period [15]. During this period, research may focus more on quality than quantity, and academic scholars may be seeking more effective research methods or waiting for more empirical data to support their research hypotheses. The fallback in this stage represents a sign that research in this field has entered a mature period, and the focus of research may shift from broad exploration to specific problem solving and application practice, reflecting the researchers' concern and thinking about the deeper issues of quality evaluation of research and study tourism.

Overall, the change in the amount of literature published in this research field demonstrates the dynamic development process of research in the field, from the start and exploration to rapid growth and diversification, and then to adjustment and maturity, with each stage contributing to the accumulation of knowledge and academic deepening in the field [16]. As the research in the field continues to deepen, more high-quality research results will emerge, providing more scientific and systematic theoretical support and practical guidance for the practice of study tours.

#### B. Analysis of Literature Authors

1) *Authors and issuing organizations:* The depth of cooperation among the authors of the literature and the academic influence of the core authors are key indicators for

assessing the maturity of research in this field. By extracting the first author information of 671 documents, a total of 619 authors were identified, of which 52 had more than 2 publications, accounting for 8.4% of the total number of authors. This data indicates that the number of scholars who have been deeply engaged in researching this field for a long period of time is relatively limited, but they have a high influence and academic contribution to the research of this field, which not only enriches the academic discussion on the evaluation of the quality of research and study tours but also provides important studies and inspirations for the subsequent research [17]. They not only enrich the academic discussion on quality evaluation of study tours, but also provide important references and inspirations for subsequent studies. According to Price's law, the number of publications by the core authors calculated in this study is only 1.03, which is inconsistent with the expectation of Price's law, proving that the research in this field is not yet mature, and the leadership role of the high-producing authors has not yet been emphasized [18]. In view of this, this paper defines scholars with two or more publications as high-producing authors in order to more accurately identify researchers who have made significant contributions to the field of this research. Statistically, there are 52 high-producing authors with a total of 131 publications, accounting for 15.5% of the total number of publications. This percentage indicates that despite the relatively small number of high-producing authors, they have played an important role in advancing research in the field as shown in Table I.

In addition to individual research scholars, the contribution of research institutions in this research field cannot be ignored. These institutions have provided substantial research funding, resource support and academic environment support for research in this field, thus facilitating collaboration and knowledge sharing among scholars in this research field [19]. After counting the first author's institution, it was found that university institutions published 325 documents and research institutes published 163 documents. The percentage of publications from university institutions is about 48.40% and the percentage of publications from research institutes is about 24.30%. This data shows that university institutions play a leading role in the research in this field, and research institutes have also made significant contributions [20]. In addition, of the 46 universities with more than two publications, 67% are in the computer technology application category and about 22% are in the teacher training category. This finding indicates that computer-based universities are more prominent in terms of attention and research results in this field of study, and they are more active and rich in this field of study compared to other types of institutions.

In addition, this paper also statistically analyzes the number of publications and citations of the authors to assess their research contributions and influence. Highly prolific authors usually have a high number of citations, indicating that their research results have been widely noticed and recognized by all circles and disciplines, and the research results of these core authors have not only promoted the theoretical development of the field, but also provided theoretical guidance for practice.

TABLE I. LIST OF STATISTICS ON THE NUMBER OF PUBLICATIONS BY CORE AUTHORS

Author	Number of communications	Author	Number of communications
Alkhamees, Nora	2	Li, Qing	2
Aloud, Monira Essa	2	Li, Shaoshuai	2
Ammirato, Salvatore	2	Liu, Chichang	2
Balland, Pierre-Alexandre	2	Liu, Hao	2
Bhattacharya, Pronaya	2	Liu, Weihua	2
Bodendorf, Frank	2	Liu, Xiaolei	2
Broekel, Tom	2	Liu, Zonghua	2
Cao, Jie	2	Long, Shangsong	2
Cerna, Fernando V	2	Lu, S-Y	2
Chen, Chien-Ming	2	Ma, Qiongxiu	2
Chen, Ruey-Shun	2	O'clery, Neave	2
Chen, Yeh-Cheng	2	Rabelo, Ricardo A L	2
Contreras, Javier	2	Raso, Cinzia	2
Deng, Shangkun	2	Rigby, David	2
Dincer, Hasan	2	Rodrigues, Joel J P C	2
Diodato, Dario	2	Sofo, Francesco	2
Felicetti, Alberto Michele	2	Tanwar, Sudeep	2
Franke, Joerg	2	Tian, Guixian	2
Giuliani, Elisa	2	Wang, Fei-Yue	2
Guo, Naicheng	2	Wang, Shuai	2
Guo, Xiaobo	2	Xiao, Yingyuan	2
Hausmann, Ricardo	2	Xiong, Naixue	2
Hsu, Ching-Hsien	2	Yuksel, Serhat	2
Huang, Szu-Hao	2	Zhang, Wenyuan	2
Li, Jing	2	Zheng, Wenguang	2
Zhu, Yingke	2	Zhou, MengChu	2

Based on the results of the authors' analysis of the literature, it is suggested that future research should focus more on interdisciplinary and international cooperation. Knowledge exchange and innovation can be promoted by strengthening cooperation between researchers from different fields and different regions [21]. At the same time, emerging research institutions and young scholars are encouraged to participate in research on quality assessment of study tours in order to increase the diversity and vitality of research.

2) *Author collaboration networks*: In this study, the collaborative network of scholars in this research area was carefully analyzed through CiteSpace 6.3.R1 software. The co-occurrence threshold was set to 2, so that the connectivity between two scholars would only be visible in the network if they had co-authored at least 2 papers. This setting helps to capture the main collaboration patterns of authors in the field, while filtering out episodic collaborations and ensuring that the network mapping is somewhat stable and substantial [22]. The author collaboration network mapping consists of 622 nodes and 937 connectors, with nodes representing independent research authors and connectors indicating collaborative

relationships between them. Although the network density is only 0.0049, showing that the overall structure is relatively loose and the author collaboration network has not yet formed a highly dense cluster. However, the gradual increase in the frequency of collaboration among research scholars in the field compared to historical data signals the potential for future development of research collaboration in the field. As shown in Fig. 2.

The mapping of author collaboration networks, as shown in Fig. 2, not only demonstrates the current research collaboration dynamics, but also foretells the possible development direction of future collaboration networks. It is worth noting that the distribution of high-producing authors is relatively concentrated, and the research results are bit prominent in specific years, which may be related to the research hotspots, financial support, or specific research projects at that time [23]. For example, author Ammirato-Salvatore's high output in 2019 reflects a concentrated burst of demand in that research area in that year. Meanwhile, Balland-Pierre-Alexandre's multiple research outputs published in 2022 may be related to the financial support and policy impetus of related research projects in that year.

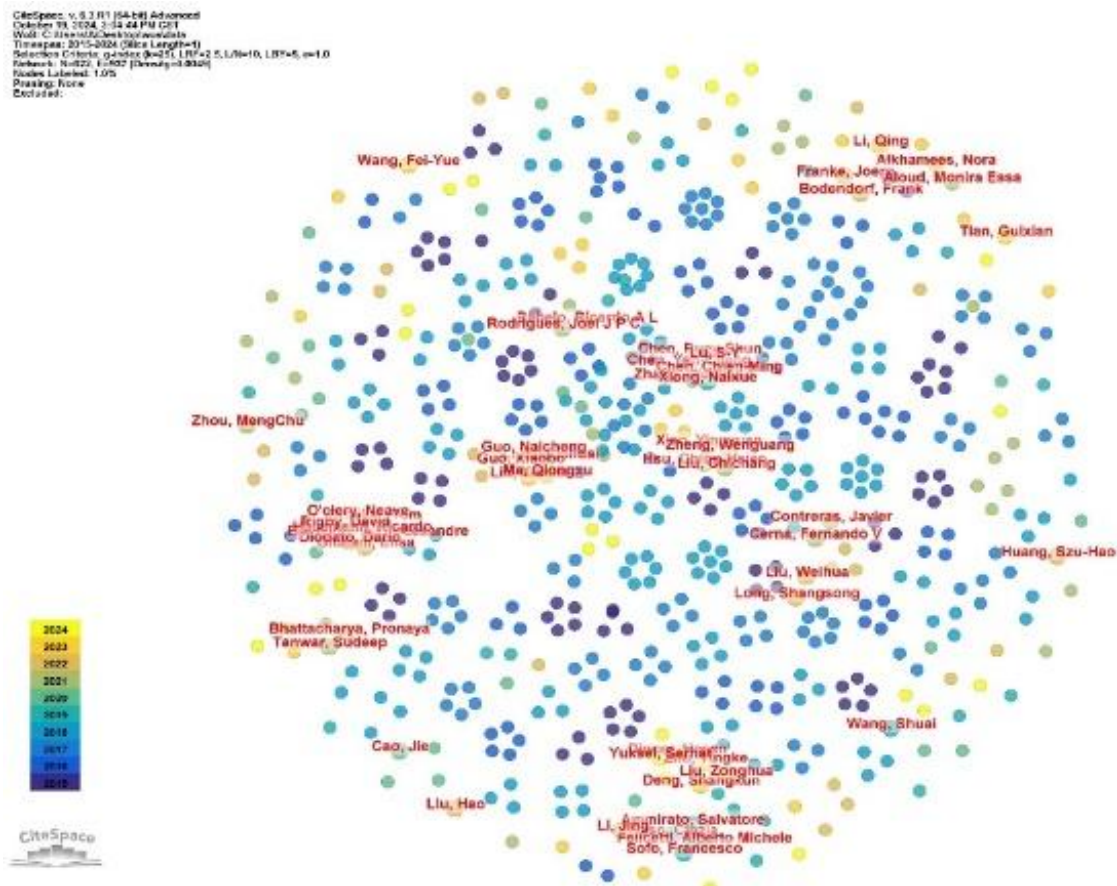


Fig. 2. Mapping of author collaboration networks.

The evolutionary trend of the authors' collaborative network provides a visual observation of the researchers' activity and participation patterns in the field. Some authors consistently publish research successes under the same topic in the same field, showing their long-term research and in-depth exploration of the research area. While other authors publish only 1 research result, their participation increases the diversity of the author collaboration network. This diversity in the author collaboration network reflects the broad appeal and flexibility of the research field, providing a rich variety of perspectives and methodologies for research in this area. Over time, it is expected that more new researchers will join this field of research, further enriching the structure of the author collaboration network [24]. As the collaboration deepens and expands, it is expected that research collaboration in this field will become more intense and systematic, which will not only promote the accumulation of knowledge and innovation, but also the development of interdisciplinary research. The development of such collaborative networks heralds a more active and diverse future for the research field of research and study tourism quality evaluation.

### C. Distribution Analysis of Journals

1) *Analysis of core journals:* After counting the number of journal articles published in this research field, a number of journals with high influence in this field were found. These journals not only provide a platform for the publication of

research results in this field, but also reflect the popularity and academic attention of different research directions [25]. The top three journals are Expert Syst Appl, IEEE Access and Eur J Oper Res, with 227, 178 and 149 articles respectively. Among them, Expert Syst Appl focuses on original papers in the application field, with 96.25% of research articles, which has a significant academic influence in this research field, IEEE Access focuses on interdisciplinary research, and Eur J Oper Res prefers operations research methods and decision-making practices. Inform Sciences and Sustainability-Base, which follow closely in the ranking, are biased with information science and sustainability research [26]. The specialized nature of these journals is enough to show that this field of study is an interdisciplinary field that involves multidisciplinary integration of innovative research. As shown in Table II.

2) *Analysis of cited journals:* To further understand the interactions between core academic journals in this research area and the potential correlations between research topics in this area. In this paper, a network graph of journal co-citation relationships was reconstructed for the journals described above using CiteSpace 6.3.R1 software. The spectrogram consists of 473 nodes and 2613 connecting lines, with a network density of 0.0049 and a relatively loose overall network structure. As shown in Fig. 3.

TABLE II. LIST OF STATISTICS ON THE NUMBER OF ARTICLES IN CORE JOURNALS

PERIODICALS	VOLUME OF LITERATURE	PERIODICALS	VOLUME OF LITERATURE
Express Syst Appl	227	Appl Energ	63
IEEE Access	178	Eng Appl Artif Intel	61
Eur J Oper Res	149	Energies	60
Lect Notes Comput Sc	118	Technol Forecast Soc	59
J Clean Prod	116	J Bus Res	57
Inform Sciences	109	Energy	52
Sustainability-Basel	109	Arxiv	52
Decis Support Syst	108	Int J Inform Manage	49
Appl Soft Comput	106	Appl Sci-Basel	49
Manage Sci	93	Commun Acm	48
Int J Prod Econ	91	Ieee T Intell Transp	48
Knowl-Based System	91	Soft Comput	48
Int J Prod Res	89	Omega-Int J Manage S	47
Future Gener Comp Sy	83	Comput Oper Res	46
Ieee T Ind Inform	80	Ann Oper Res	45
Neurocomputing	77	Int J Elec Power	44
Comput Ind Eng	74	Energy Policy	44
Procedia Comput Sci	72	J Bank Financ	42
Ieee Internet Things	72	Plos One	42
Renew Sust Energy Rev	70	J Intell Fuzzy Syst	42
Sensors-Basel	69	Adv Neur In	41
Ieee T Knowl Data En	68	Lect Notes Artif Int	41
J Financ	67	Ieee Commun Surv Tut	40
Neural Comput Appl	65		

CiteSpace v. 5.3.R1 (64-bit Advanced)  
October 30, 2024, 10:50:59 AM CST  
Work: C:\Users\user\Documents\IJACSA  
Preset: g=0.1, z=0.01, w=0.1, q=0.1, r=1, p=0.01, m=10, n=10, l=10  
Network: 0.9473, 5.2812, Q=0.9324  
Largest s: 1, 1.00, 4.04 (97%)  
Modularity: 1.00  
Meaning: None  
Execution:

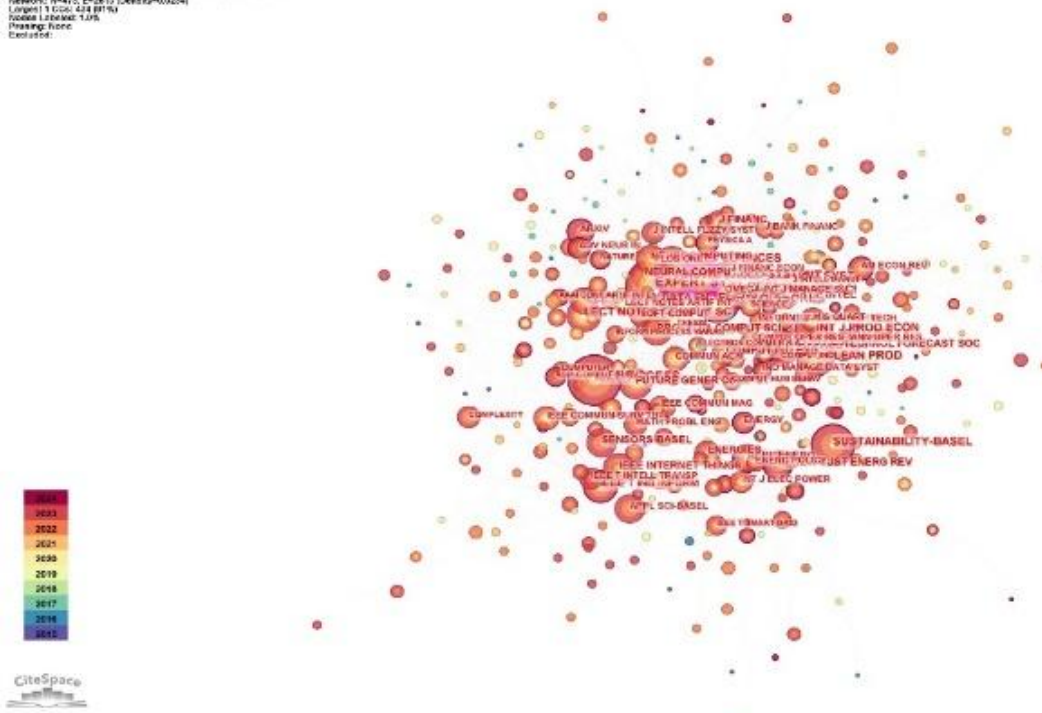


Fig. 3. Co-citation network mapping of core journals.

In the analysis, it was found that core journals such as Knowl-Based Syst, Appl Soft Comput, and Inform Sciences had high co-citations, which reflected the concentration of attention and publication of high-quality research results on the main research themes in these core journals. For example, Knowl-Based Syst's highly cited literature in 2016 points to the application of knowledge systems in research in this field [27]. The citations of Inform Sciences are related to the role of information science in the analysis of tourism data software. IEEE Commun Mag's journals' citations have increased significantly in 2016, showing that they are contributions in the field of communication technology and management science.

By analyzing the co-cited journals over time, it is possible to observe the trend of research themes within the research field. For example, with the development of technology, some emerging research themes such as big data and artificial intelligence have begun to occupy an important position in the journal co-citation network [28]. These trends indicate that research in this field is gradually moving in a technology-driven

direction, while reflecting the high level of academic interest in the practical application of emerging technologies in this research area.

#### IV. RELEVANT ANALYSIS BASED ON THE FIELD

##### A. Hot Topic Analysis

In this study, the following core keyword co-occurrence mapping was constructed by CiteSpace 6.3.R1 software with the time slice parameter set to 1 year and the keyword occurrence frequency selection threshold parameter set to 10. The total number of nodes  $N=342$ , links  $E=1269$ , network density value 0.0218, through the nodes and links can show the research focus of the field, and the social network connection between the research topic. The larger the node, the more the keyword is proved to be hot, and the more times it co-occurs in the literature [29]. The thicker the linkage, the stronger the connection between the keywords and the deeper the influence is proved. As shown in Fig. 4.

CiteSpace v. 5.3.R1 [54-b8] Advanced  
October 20, 2024, 11:51:01 AM CST  
Wall: C:\Users\user\Desktop\workspace  
TimeSpan: 2015-2024 (Slice Length=1)  
Selection Criteria: g-index (k=25), LRF=2.5, L/N=10, LRF=5, w=1.0  
Network: N=342, E=1269 (Density=0.0218)  
Largest CC: 213 (66%)  
Nodes Labeled: 1,075  
Pruning: Force  
Modularity

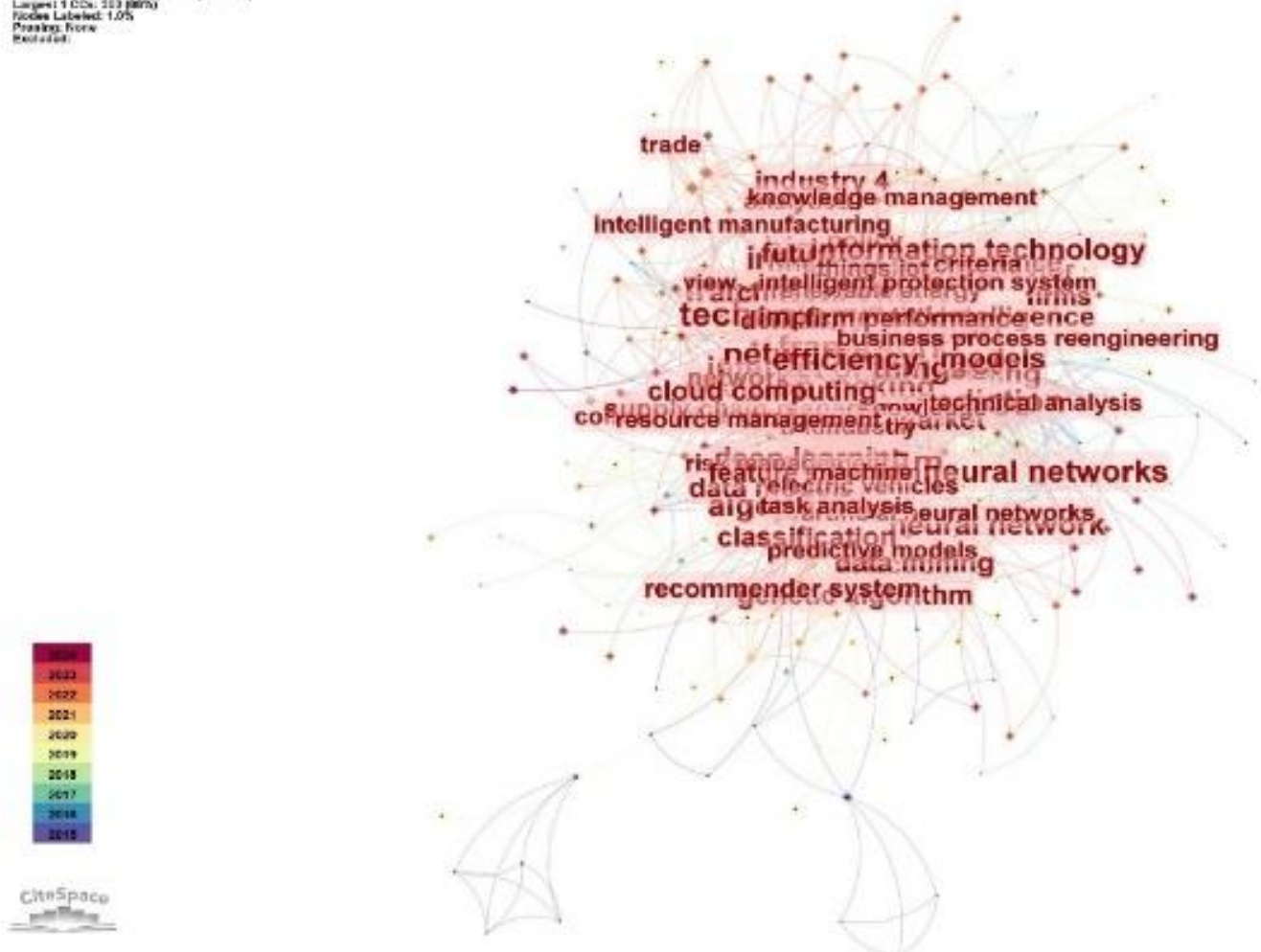


Fig. 4. Core keyword co-occurrence network.

Combined with the core keyword co-occurrence mapping, the keywords with larger nodes and more frequent occurrences can be clearly seen. These core keywords basically cover the hot topics in the research in this field. For example, Model and System, as core keywords, appeared 74 times in 2016 and 40 times each in 2015 and 2016, respectively, showing that scholars have sustained research interests in the construction and assessment of evaluation models in this field [30]. These studies may involve the construction of theoretical models, analysis of system dynamics, and empirical testing of models. Research scholars have attempted to use these models to explain and predict changes in the quality of research and learning activities within the field and their impact on educational outcomes. Artificial Intelligence appeared 43 times in 2015, while Machine Learning appeared 51 times in 2017, which demonstrates that the use of intelligent technologies in the practical applications in this field of study are beginning to gain traction [31]. These studies focus on the use of AI and Machine Learning algorithms to analyze tourism data, predict tourism trends, and enhance the tourism experience in terms of software applications. Management (Management) appeared 50 times in 2017, and the hotspot of research is beginning to shift from theoretical models and software applications to research and study tourism management practices [32]. These studies focus on developing and validating evaluation metrics, as well as exploring the impact of different factors on the field [33]. Internet (Internet) appears 30 times in 2019, while Deep Learning (Deep Learning) appears 24 times in 2020. It shows that in recent years, the hotspots in this research field have been influenced by Internet technology, and research scholars have begun to explore new

research tourism models, Deep Learning to improve the research experience, and evaluation methods [34].

Through the interpretation of the core keyword co-occurrence, it can be observed that the hot topics of research in this field are gradually shifting from the construction of theoretical models to empirical analysis and technological applications, and academic scholars are utilizing intelligent technologies and data analysis to enhance the quality and effectiveness of research and learning in this field. The keyword co-occurrence analysis not only demonstrates the hot topics in this field, but also provides directional guidance for us to deeply understand the research dynamics in this field.

### B. Analysis of Hot Areas

In order to further understand the hot field of this research, this paper clusters the core keywords and draws the core keyword clustering map. Among them, Modularity  $Q=0.4796$ , Silhouette  $S=0.7824$ . It is not difficult to see from the two queer values that the clustering structure of the hot area constructed in this study is obvious, the internal module similarity is extremely high, and the mapping has high and significant confidence [35]. Using the software LSI algorithm to automatically calculate, filtering out the classification of keyword class group members less than 10, and finally obtaining the hotspot domain clustering of 8 major categories. In order, 00# deep learning algorithm, 01# intelligent manufacturing, 02# assisting investor, 03# Chinese logistics companies, 04# economic complexity, the 05#using reinforcement learning, 06#blockchain technology, 07#sustainable m-commerce as given in Fig. 5.

CiteSpace v. 5.7.R1 (64-bit Advanced)  
October 20, 2024, 2:38:33 PM CST  
Node: C:\Users\user\Documents\workspace  
Workspace: C:\Users\user\Documents\workspace  
Selection Criteria: g-index (k=2), LRF=2.0, L/N=10, LRF=6, q=1.0  
Network: N=142, E=1289 (Density=0.9216)  
Pruning: LRF=1.0  
Modularity: Q=0.4796  
Weighted Mean Silhouette: S=0.7824  
Mean Silhouette: S=0.9841  
Classified

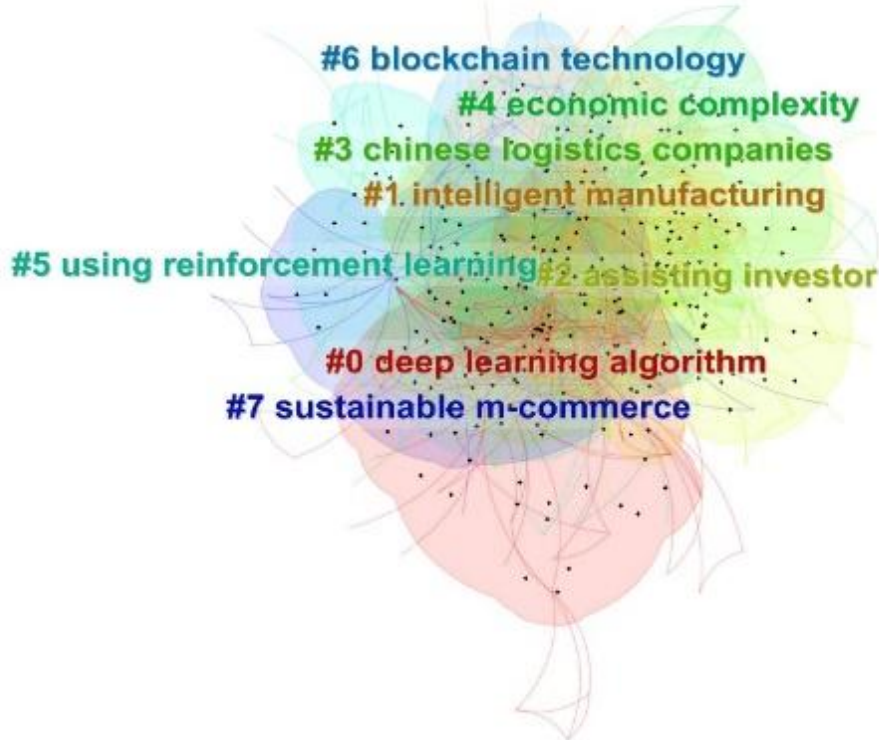


Fig. 5. Core keyword clustering network mapping.



According to the content and topic relevance of keyword clustering, this paper obtained three major research hotspot areas with high similarity or high impact relationship by clustering the eight hotspot areas again. They are technology and algorithmic innovation, industry and economic development, and education and social impact areas.

#### Hot Area 1: Technology and Algorithmic Innovation

This clustering covers 00# Deep Learning Algorithm, 05# Using Reinforcement Learning and 06# Blockchain Technology. The application of these technologies in this research area demonstrates the strong academic interest in utilizing advanced technologies to enhance tourism experiences and evaluation methods. Deep learning algorithms show great potential in handling tourism big data analytics, personalized recommendation systems and intelligent decision support systems. Reinforcement learning, on the other hand, plays a role in dynamically optimizing tourism strategies and enhancing user interaction experience [36]. Blockchain technology, on the other hand, focuses on improving the security and transparency of tourism transactions, especially in tourism supply chain management and traceability of tourism products, and technological and algorithmic innovations have driven the rapid development of this research area.

#### Hot Area 2: Industry and Economic Development

01# Intelligent Manufacturing, 03# Chinese Logistics Companies and 4# Economic Complexity constitute the field of industry and economic development, which focuses on the economic impact of study tours and how to promote industrial upgrading and economic development through study tours. The research in this area focuses on the impact of study tours on the economy and how to promote industrial upgrading and economic development through study tours. The co-occurrence of keywords in the clusters intuitively demonstrates the close connection between study tourism and industrial development and economic dynamics [37]. The application of smart manufacturing technologies promotes innovation in the tourism industry by improving the quality and productivity of tourism products [38]. The involvement of logistics companies highlights the importance of efficient logistics in safeguarding the tourism experience and improving the quality of tourism services. The study of economic complexity focuses on the impact of the macroeconomic environment on the development of study tourism and how to maintain the stable growth of the tourism industry under complex and changing economic conditions.

#### Hot Area 3: Education and Social Impact Clustering

The third hot area of research, to be composed of the clustering of 02# Assisting Investor, 07# Sustainable M-Commerce and 08# Innovation, demonstrates the importance of this area of research both at the educational level and at the societal level. Research in assisting investors focuses on attracting investment through research and study tourism programs and optimizing tourism products and services to enhance return on investment [39]. Research in sustainable m-commerce focuses on the use of mobile technology in

environmental tourism practices and research and study tourism sustainability [40]. The application of Internet technology plays a key role in facilitating tourism information sharing, enhancing tourism experience and improving the efficiency of tourism services.

In summary, the core keyword clustering analysis reveals both the research hotspots in this research field and reflects the intrinsic connection between the hotspots. The clustering of these research areas provides a direction for the research in this field and provides theoretical support for scholars when practicing their work. With technological advances and changes in the global economic environment, these research hotspots change accordingly, bringing new research opportunities and challenges to the research field.

#### C. Trend Analysis of Dynamic Evolution

In the in-depth analysis of this research field, keyword time mapping provides a unique perspective, prompting research scholars to observe the dynamic evolutionary trends of research hotspots within the field. In this paper, we construct a map of the dynamic evolutionary trend of research hotspots from 2015 to 2024 by using the time zone mapping function of CiteSpace 6.3.R1 software. Each node represents a keyword, and the keyword is fixed in the year of its first appearance. The larger the node, the higher the frequency of the keyword; the longer the arc and the darker the color, the higher the attention of the keyword research and the longer the duration. Along the evolutionary pulse of the keywords, the temporal development of the research hotspots in the field is excavated, so as to explore the future development trend of the research field. As shown in Fig. 6.

From the time mapping, it is easy to find that most of the arcs lasted between 5-7 years, and some keywords lasted for 2-3 years. Among them, Models (models) appeared with higher frequency and core values, reaching a peak in 2016, research scholars in this field began to focus on constructing research and study tourism evaluation models, which may be related to the exploration of evaluation methods and tools at that time, but this concern quickly disappeared in 2017, and this disappearance may be that the construction of models has already matured or that the research in this field was replaced by emerging hotspots. Systems emerged as a research hotspot gradually from 2017 and lasted for two years. During this period, research scholars regarded research tourism as a complete system, and began to pay attention to the interaction and overall optimization between its internal elements, and the systematic way of thinking promoted the development of the whole research field. By 2018, the keyword Behavior appeared, pointing to the research scholars' in-depth and focused research on the behavioral patterns of tourists, trying to interpret their impact on the quality of research and study tourism from the direction of tourists' needs, preferences and behaviors [41]. In 2020, two different sub-directions of research emerged, namely Recommender Systems and Risk Management, with some researchers focusing on the application and impact of recommender systems on personalized services in study tours, while others began to turn to the potential risks and risk management in the tourism process.



behavior analysis and recommender system research in the later stage, which reflects the impact of technological advancement and social development on the research in this field. In particular, the application of emerging technologies such as deep learning, reinforcement learning, blockchain technology and artificial intelligence has provided new research tools and methods for this research field.

### B. Research Limitations

In this study, despite the comprehensive visualization and analysis of the literature in the research area through CiteSpace software, there are still some limitations that may have had an impact on the comprehensiveness of the findings and the depth of the study. First, the selection of the study sample was limited to the literature included in the Web of Science database, which may mean that the source data failed to cover all relevant studies, especially those published in regional or specialized journals, and this choice may have resulted in the analysis results not being fully representative of the current state of research in the whole research area. Second, the keyword co-occurrence analysis, which is mainly based on the keyword fields of the literature, although it can show the research hotspots and research trends, fails to fully capture the depth and diversity of the literature content, and some important research topics may not be covered by the keywords or fully reflected in the keyword fields in the titles of the literature. In addition, the time mapping analysis, while showing the evolution of hotspots in the research field, does not delve into the social, economic and policy factors behind these changes. These environmental factors may have a significant impact on the research hotspots and trends in the field, and the analysis of the current study fails to adequately consider these external variables.

### C. Future Prospects

In response to these limitations, future research will go back to expanding the scope of literature samples to include literature data from multilingual and multiregional countries in order to gain a more comprehensive research perspective. In terms of research methodology, the theoretical models, methodologies and empirical studies proposed in the literature will be explored in depth in conjunction with the content analysis methodology in order to more accurately understand the research hotspots and trends. External variables such as social, economic and policy contextual factors will be added to analyze their impact on the research hotspots and trends in the field, so as to find deeper research motivations.

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