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RESEARCH STATUS OF INNOVATION AND ENTREPRENEURSHIP EDUCATION ECOSYSTEM: DATA ANALYSIS FROM CNKI IN CHINA

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Abstract:

Innovation and entrepreneurship education ecosystem is a hot and difficult issue in the field of innovation and entrepreneurship education research in recent years. The research on innovation and entrepreneurship education ecosystem in China has gone through 10 years of research and development. In order to grasp the current status, hotspots, trends and future of innovation and entrepreneurship education ecosystem research in China, 158 sample documents from the CNKI database were taken as the research object, and the bibliometric method was used to visualise and analyse the big data of the literature in terms of the amount of papers published annually, the research topics, the distribution of disciplines, the high-yield authors, the journals of the published papers, the institutions of the published papers, the high citations, the number of downloads, and the categories of the sources. Comparison. The results found that: China's innovation and entrepreneurship education ecosystem research is mainly divided into the disciplines of higher education and vocational education; journals such as Innovation and Entrepreneurship Theory, Research and Practice, Journal of Heilongjiang Institute of Education and Modernisation of Education are the main dissemination carriers; PKUC is the main source of journals for high-quality theses; Huangshan College, Wenzhou University, Northeast Normal University and Henan University of Technology are the main publication institutions ; Jiangsu Provincial Fund Project and Ministry of Education Fund Project are the main funding funds.

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Keywords:

Ecosystem, Innovation And Entrepreneurship, Innovation And Entrepreneurship Education, CNKI

Introduction

Innovation and entrepreneurship education has become the engine and driving force to promote social and economic development and advancement. Nowadays, colleges and universities all over the world are actively carrying out the exploration of innovation and entrepreneurship education mode (Yao & Zhang, 2018).

The research on the construction of innovation and entrepreneurship education ecosystem is the hotspot and difficulty in the field of innovation and entrepreneurship education research at home and abroad in recent years (Li et al., 2021). Innovation and entrepreneurship education ecosystem is a kind of entrepreneurship education model explored by international entrepreneurial universities in long-term teaching practice, which has strong vitality. It is a man-made ecosystem in a certain economic and social environment, a dynamic complex and symbiotic network of various elements favourable to the development of innovation and entrepreneurship education with universities as the core (Yao & Zhang, 2018). Stanford University is the pioneer and model for the exploration of the ecological model of innovation and entrepreneurship education.

The construction of innovation and entrepreneurship education ecosystem carries distinct national will and serves the needs of national major strategic development. Therefore, the research of innovation and entrepreneurship education ecosystem construction has a very important significance of the times. The research on the construction of innovation and entrepreneurship education ecosystem is the top priority of innovation and entrepreneurship education research. This is because the ecosystem of innovation and entrepreneurship education is the higher or even the highest level and stage of innovation and entrepreneurship education, and it is also the full embodiment of the essence of innovation and entrepreneurship education (Li et al., 2021). Innovation and entrepreneurship education is not a certain type or a certain kind of education, not limited to a certain stage or field of education, but an integrated product of the whole education, which is the basic and core paradigm and mode of education in the new era. It is undoubtedly a set of extremely complex system engineering, and systemic is its essential attribute. The concept of innovation and entrepreneurship education ecosystem means that academics have a deeper and more specific understanding of the nature of innovation and entrepreneurship education.

Clearly sorting out and portraying the thematic evolution trajectory of the research in the field of innovation and entrepreneurship education ecosystem and grasping the development trend of this research field play an important role in advancing the development of innovation and entrepreneurship education ecosystem and its related disciplines.

Scope

The object of this study is academic papers related to the ecosystem of innovation and entrepreneurship education included in the CNKI database. Using the CNKI database, bibliometric analyses of the extracted academic journal papers were conducted to determine the number of published papers, prolific authors, popular themes, and major research

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institutions in this field in China.

CNKI Academic Journal Database enables integrated searching of Chinese and foreign language journals. CNKI database is the largest Chinese language database in the world.

Research Objectives

The main objective of this study is to systematically examine the scholarship around innovation and entrepreneurship education ecosystems in China, with a focus on identifying trends in article publication, popular themes, highly cited authors, high-impact articles, and the main journals and institutions in which they are published. This study aims to provide insight into the current state of research on innovation and entrepreneurship education ecosystems in China. This study specifically achieves the following objectives:

1. To analyse the annual publication trends of academic papers on China's innovation and entrepreneurship education ecosystem.
2. To analyse the source categories of high-quality papers on China's innovation and entrepreneurship education ecosystem.
3. To identify the main themes of China's innovation and entrepreneurship education ecosystem research.
4. To identify the main disciplinary distribution of China's innovation and entrepreneurship education ecosystem research.
5. To identify the major journals in which China's innovation and entrepreneurship education ecosystem research papers are published.
6. To identify the major institutions where China's innovation and entrepreneurship education ecosystem research papers are published.
7. To identify the major authors of the research papers published on China's innovation and entrepreneurship education ecosystem.
8. To identify the top ten cited articles in China's innovation and entrepreneurship education ecosystem research papers.
9. To identify the top ten downloaded articles of China's innovation and entrepreneurship education ecosystem research papers.
10. To identify the top ten fund projects that fund research on China's innovation and entrepreneurship education ecosystem.

By achieving these goals, this study aims to gain insights into the current status of innovation and entrepreneurship education ecosystem research in China, and to provide researchers of innovation and entrepreneurship education ecosystem with valuable resources to help scholars conduct deeper research.

Literature Review

Dunn (2005) analysed the elements of the ecosystem based on the definition of "entrepreneurial ecosystem". Ameh and Udu (2016) proposed the concept of "entrepreneurial ecosystem", which considers the university as an independent ecosystem for entrepreneurs. After that, the research on constructing ecosystems focuses on the system as a whole, and emphasises the role of each part of the elements on the basis of synergy, and promotes the self-improvement of the ecosystem under the role of the whole and the part, among which Valentina points out that the construction of ecosystems should focus on the advantages of platforms, build virtual support platforms, and emphasise the important role of laboratories in innovation and entrepreneurship

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education (Iscaro et al., 2017).

In China, academic research results related to innovation and entrepreneurship education ecosystem began to be published in 2015. At present, China's innovation and entrepreneurship education ecosystem research is showing a good development trend, but because the research started late, the theory and practice are still in the preliminary exploration stage, and there are still many urgent research issues that need to be clarified (Song & Gao, 2022).

Zhuo and Zhao (2016) analysed the dilemmas and challenges faced in the construction of innovation and entrepreneurship ecosystem. Yao and Zhang (2018) analysed the innovation and entrepreneurship education ecosystem of Stanford University. Jia et al. (2021) considered the four components of the innovation and entrepreneurship education ecosystem are: innovation and entrepreneurship atmosphere, knowledge platform, practice platform and innovation and entrepreneurship network platform. Jia et al. (2021) constructed an innovation and entrepreneurship education ecosystem in universities based on a multi-case study of universities in the US, UK and Japan. Li et al. (2022) present the ideal pattern of innovation and entrepreneurship education ecosystem construction in universities based on the cross-case comparative analysis of eight typical universities in four countries.

The ecosystem of innovation and entrepreneurship education applies the theory of educational ecology to the field of innovation and entrepreneurship education, aims at cultivating innovation and entrepreneurship talents, focuses on integrating the concept of innovation and entrepreneurship education into the whole process of higher education talent cultivation, and realises the fusion and interaction of various elements to collaborate to promote the innovation and entrepreneurship education and improve the quality of talent cultivation of colleges and universities (Song & Wang, 2020).

With the in-depth promotion of university innovation and entrepreneurship education, the construction of an open, collaborative and symbiotic innovation and entrepreneurship education ecosystem has become the development direction of innovation and entrepreneurship education reform. Starting from the vision of educational ecology, Cheng and Li (2020) examine the innovation and entrepreneurship education ecosystem from the three dimensions of curriculum and teaching ecology, organisational ecology and environmental ecology. Through the affiliation analysis of the constituent indexes of innovation and entrepreneurship education ecosystem, 21 constituent indexes of innovation and entrepreneurship education ecosystem are selected, and through empirical analysis, it is found that the indexes of education concept, curriculum system, university-enterprise cooperation, coordination mechanism and evaluation incentives have a larger weight in the innovation and entrepreneurship education ecosystem of the university, which provides targeted reference for the construction of innovation and entrepreneurship education ecosystem of the university. Suggestions.

These recent literature reviews describe the current status of international innovation and entrepreneurship education ecosystem research and the development of China's innovation and entrepreneurship education ecosystem. CNKI is the largest academic journal database in China, and there are not many results of researching innovation and entrepreneurship education ecosystems by using CNKI's own visual analysis. China's innovation and entrepreneurship education research has been very fruitful in the past 10 years. In recent years, the research of innovation and entrepreneurship education ecosystem is a hot spot and attracts the attention of

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many scholars. At the same time, the research on innovation and entrepreneurship education ecosystem has produced many research results. It is very important for scholars concerned with this research to systematically sort out and analyse the research results of innovation and entrepreneurship education ecosystem.

Methodology

This study mainly adopts bibliometric methods. This study uses CNKI's own visual analysis method to conduct econometric analysis of relevant literature.

Bibliometric analysis is a branch of library and intelligence research that integrates mathematics, statistics, and bibliography to quantitatively depict, evaluate, and predict the current academic situation and development trend, and it has a significant macro-research trend of objectivity, quantification, and modelling. Through the metrological analysis of literature in a particular field, it can effectively grasp the research hotspots, the development trend of each field, and then objectively evaluate and predict the field.

Scientific knowledge mapping is a kind of image that shows the development process and structural relationship of scientific knowledge with knowledge domain as the object. It has the dual nature and characteristics of "diagram" and "spectrum": it is both a visual knowledge graph and a serialised knowledge spectrum, which shows the complex relationships implied by networks, structures, interactions, intersections, evolutions and derivations of knowledge units or knowledge clusters, and breeds new knowledge (Chen et al., 2015; Liu, 2010). The visual analysis of CNKI can analyse the trend and distribution of related literature, which is very intuitive and convenient.

Data Collection Strategy

This study is a literature research on China's innovation and entrepreneurship education ecosystem, and the search source is CNKI database. The search method was advanced search, with Chinese as the language and "Academic Journals" as the literature category. The search criterion "Title" is "Innovation and Entrepreneurship Education Ecosystem". There is no time limit. The search date is 31 May 2024. Results: A total of 158 articles were retrieved.

Table 1: The Selection Criterion Search String

Criterion	Inclusion	Exclusion
Language	Chinese	Non-Chinese
Timeline	<31/05/2024	-
Literature Type	Journal (Article)	Conference,Book Review
Publication Stage	Final	-

Data Analysis

CNKI covers a wealth of resources, is a search platform using the concept of knowledge management, combined with search engine, full-text search, database and other related technologies, can be found in the knowledge and information and access to the information you need. CNKI database provides Chinese academic literature, foreign language literature, dissertations, newspapers, conferences, yearbooks, tools and other types of resources, and provides online reading and download services. The fields covered include: basic sciences, literature, history and philosophy, engineering science and technology, social sciences,

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agriculture, economic and management sciences, medicine and health, and information science and technology.

CNKI, as the portal website and network publishing and distribution platform of China Knowledge Resources Database, not only realises the comprehensive integration and dissemination of academic literature resources, but also promotes the dissemination of academic literature in China. CNKI has a powerful full-text search system for network databases, and its search method is simple and flexible, which can be easily mastered by the users who don't have professional knowledge of searching. And because of the advantages of large information content, wide coverage, rapid and timely updating, and full-featured retrieval services, it has received more and more attention from scholars and become an indispensable way to retrieve Chinese materials (Tu et al., 2019).

CNKI visual analysis is a kind of academic research tool with the help of computer technology and data visualisation method. It captures, arranges and analyses a large amount of academic data (such as papers, patents, projects, etc.) and displays them through a graphical interface to help researchers understand complex academic fields in an intuitive and clear way.

CNKI Visual Analytics is not only an efficient research tool, but also a power to change the way we do academic research. It enables researchers to quickly mine valuable information from massive amounts of academic data, providing new perspectives and insights for research. At the same time, this type of analysis also improves the reproducibility and transparency of research, allowing other researchers to more accurately assess the quality and value of research work.

Results and Findings

What Are The Trends In China's Innovation And Entrepreneurship Education Ecosystem Research According To The Year Of Publication?

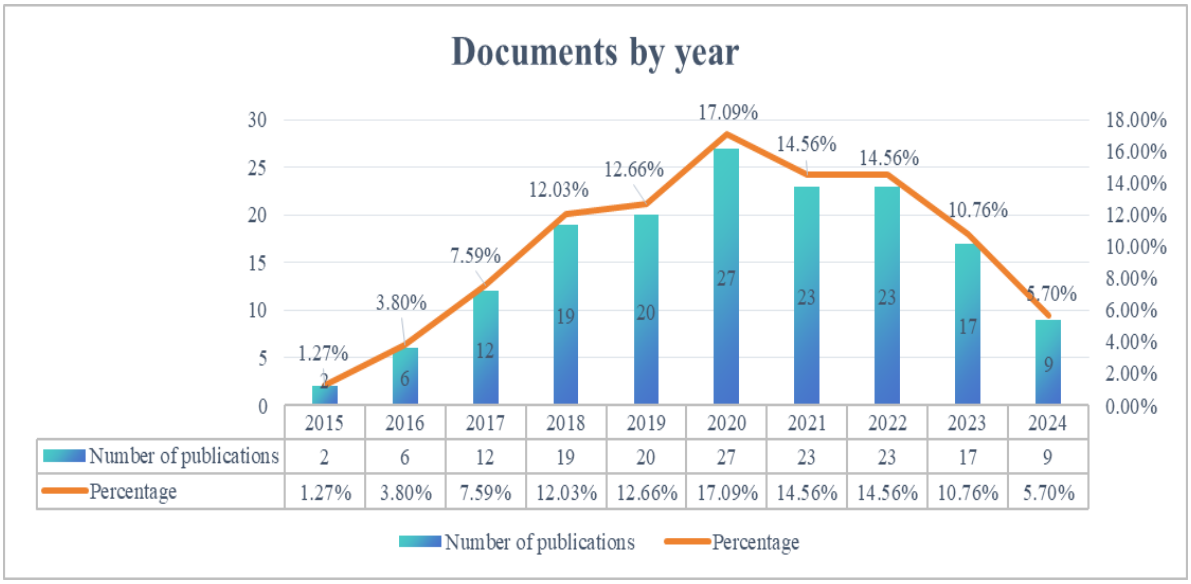

Figure 1: Statistical Chart of the Number of Published Papers

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The number and trend of literature is one of the important measures of the amount of knowledge, which directly reflects the research tendency in the field (Qiu et al., 2008).

From the time series of 158 literature retrieved, the research on innovation and entrepreneurship education ecosystem began in 2015 with only 2 articles. the number of published articles began to rise year by year after 2016. 27 articles were published in 2020, reaching a peak. After that it levelled off, remaining at an annual average of 20 articles. It is also expected to remain essentially flat at 20 articles or with minor fluctuations for some time to come.

Regarding the year-on-year increase starting in 2016, the authors believe that this is closely related to the great importance China has attached to innovation and entrepreneurship since 2015.In March 2015, the General Office of the State Council issued the Guiding Opinions on the Development of Crowd Creative Space to Promote Mass Innovation and Entrepreneurship, which called for promoting innovation and entrepreneurship from the aspects of public service, financial support, market financing, innovation of activities, and creation of an atmosphere, enlarging and strengthening crowd creation space, and improving business incubation. On 13 May 2015, the General Office of the State Council promulgated the "Implementation Opinions on Deepening the Reform of Innovation and Entrepreneurship Education in Colleges and Universities", which requires colleges and universities to improve the quality standard of talent cultivation, innovate the mechanism of talent cultivation, and assist the smooth implementation of the "dual-creation" education in terms of the curriculum and teaching, the management system, the teaching staff, and the funding policy. "In June 2015, the State Council issued the Opinions on Several Policies and Measures for Vigorously Promoting Mass Entrepreneurship and Innovation, pointing out that it is necessary to innovate the system and mechanism, optimise the financial support, build the ecology of entrepreneurship, construct a platform for dual-creation, and improve the synergy mechanism. Under the call of the Chinese government and the Ministry of Education, all parties have actively cooperated with each other to study the related contents of innovation and entrepreneurship in depth, which to a certain extent reflects the guiding role of the national policy (Zhang & Lu, 2019).

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What Are The Source Categories For High-Quality Papers?

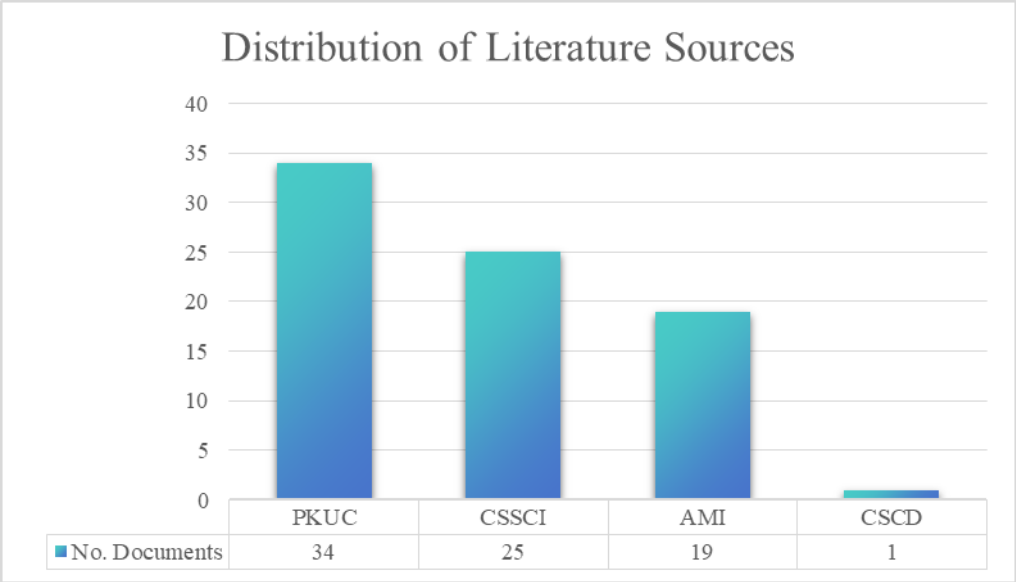

Figure 2: Source Categories For High-Quality Papers

A Guide to the Core Journal of China, also known as Peking University Core Journals, abbreviated as PKUC, is the result of the Chinese Core Journal Evaluation Research Project, which was participated by many journalists and experts from a dozen university libraries in Beijing. Chinese Social Sciences Citation Index, abbreviated as CSSCI, was developed by the Chinese Social Sciences Research and Evaluation Centre of Nanjing University to search for papers included and cited in Chinese social sciences. Chinese Social Sciences Citation Index, abbreviated as CSSCI, is a database developed by the China Social Sciences Research and Evaluation Centre of Nanjing University, which is used to retrieve the papers included in the Chinese social sciences and the literature cited, and it is a landmark project in the field of evaluation of humanities and social sciences in China. AMI is the core periodicals of the humanities and social sciences in China. CSCD refers to the Chinese Science Citation Database, abbreviated as CSCD, and it is also the core periodicals of the Chinese humanities and social sciences. Papers included in any of PKUC, CSSCI, AMI and CSCD in China are high-quality research papers.

CSSCI contains the highest quality Chinese core literature in China. 25 of the 158 samples were included in CSSCI, accounting for 15.8%. 34 of the samples were included in Peking University core literature. Thirty-four papers, or 21.5% of the sample, were included in the Peking University Core. There are also 19 articles included in AMI and 1 article included in CSCD.

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What Are The Main Research Themes?

Table 2: Main Research Topics

Research Topic	No. Documents
Innovative Education Ecosystem	134
Innovation and entrepreneurship education	113
Ecosystem	99
Innovation and entrepreneurship education in universities	46
Innovation and entrepreneurship	39
Ecosystem construction	35
Vocational colleges	16
Education ecosystem	14
Building research	11
Innovation in universities	9

The top ten research themes are selected and organised into Table 2. The main research themes focus on the related expressions such as innovation education ecosystem, innovation and entrepreneurship education, ecosystem, innovation and entrepreneurship education in universities, innovation and entrepreneurship, ecosystem construction, etc. There is a relatively similarity or a close connection between the themes, and the core words are all innovation and entrepreneurship education or ecosystem. The distribution of the research themes is very wide, involving the education system, education model, ecosystem, reform, curriculum, professionalism, synergy, etc., all of which are closely concerned with the innovation and entrepreneurship education ecosystem.

What Are The Main Disciplines?

Table 3: Main research disciplines

Branch of Learning	No. Documents
Higher education	136
Vocational education	19
Enterprise economy	7
Macroeconomic management and sustainable development	3
Talent Studies and Labor Science	3
Art, Calligraphy, Sculpture, and Photography	1
Medical Education and Medical Edge Disciplines	1
Library Information and Digital Library	1
Educational Theory and Educational Management	1
Sports	1

The top ten research themes are selected and organised into Table 3. The results show that the main disciplines of China's innovation and entrepreneurship education ecosystem research are distributed in higher education and vocational education, which account for the vast majority of all the studies. This indicates that the research on innovation and entrepreneurship education ecosystem is mainly in the field of higher education and vocational education, which is consistent with the direction guided by the Chinese government's policy.

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AIJBES
EISSN: 2682-8545
Volume 6 Issue 20 (June 2024) PP. 269-286
DOI 10.35631/AIJBES.620023

What Are The Major Journals For Research Paper Publication?

Table 4: Major Journals for Research Paper Publication

Academic Journals	No. Documents
Research and Practice on Innovation and Entrepreneurship Theory	4
Journal of Heilongjiang University of Education	3
Modernization of Education	3
Employment of Chinese college students	2
Industry and Technology Forum	2
intelligence	2
Journal of Mount Huangshan University	2
Adult education in China	2
Science and Education Literature Collection (First Ten Days)	2
Strait Technology and Industry	2
Journal of Liuzhou Vocational and Technical College	2
Science and Technology in Chinese Universities	2
Henan Education (Higher Education)	2
Jiangsu Science and Technology Information	2
Education and Career	2
Technology and Innovation	2
World Education Information	2
Journal of Hubei Open Vocational College	2
Journal of Guangzhou City Vocational College	2
Journal of Jilin Agricultural Science and Technology College	2
Journal of Taiyuan City Vocational and Technical College	2

Academic journals are vehicles for disseminating the results of academic research. Statistics on the number of papers published in academic journals can help identify core journals that have a significant impact on the subject area. Table 4 lists the academic journals that published more than 2 articles in the sample literature. The results show that educational journals are the main source of knowledge in the field of innovation and entrepreneurship education ecosystems. It is also found that the distribution of academic journals that publish these papers is scattered. The first-ranked Journal of Innovation and Entrepreneurship Theory Research and Practice has only 4 articles, and the second-ranked Journal of Heilongjiang Institute of Education and Education Modernisation both have only 3 articles. Unfortunately, none of the three journals in the top three rankings are included in CSSCI, PAUC, AMI and CSCD. This shows that the level of research papers about innovation and entrepreneurship education ecosystem is not high enough, and there are not many papers published in high-quality journals. Even if some of them are published in high-quality academic journals, they have not yet reached the impact of aggregation.

Who Are The Major Organisations That Publish Research Papers?

Table 5: Major Organisations That Publish Research Papers

Organization	No. Documents
Mount Huangshan University	5
Wenzhou University	4
Northeast Normal University	4

Advanced International Journal of Business, Entrepreneurship and SME's
AIJBES
EISSN: 2682-8545
Volume 6 Issue 20 (June 2024) PP. 269-286
DOI 10.35631/AIJBES.620023

Henan University of Technology	4
Anhui Mechanical and Electrical Vocational and Technical College	3
Guangzhou City Vocational College	3
Hefei Polytechnic University	3
Zhejiang Media College	2
Huazhong Agricultural University	2
Jiangsu university	2
Wuhan University of Engineering	2
Northeastern University	2
Yancheng Teachers University	2
Nanjing University of Technology	2
School of Urban Science and Technology, Chongqing University	2
Zhejiang University	2
Jishou University	2
Liaolin University	2
Shenyang Normal University	2
Huaiyin Institute of Technology	2

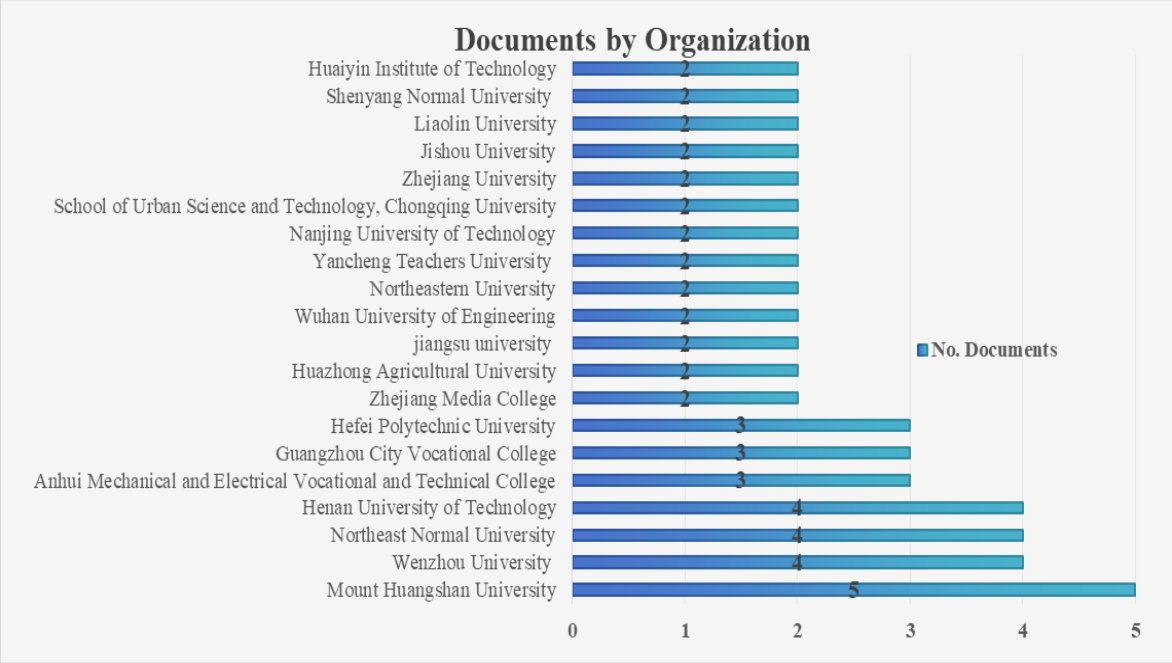

Figure 3: Major Organisations That Publish Research Papers

The institutions that published papers in the study of the ecosystem of innovation and entrepreneurship education were universities and colleges, with a predominance of universities. There are 20 institutions with more than 2 published papers, 13 universities and 7 colleges. Huangshan College, which published the most papers, published 5 papers, followed by Wenzhou University, Northeast Normal University and Henan University of Technology, all with 4 papers. Table 5 and Figure 2 list the publishing institutions that published more than 2 tables of papers, which are the backbone of the research on innovation and entrepreneurship education ecosystem in China.

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Who Are The Main Authors Of Published Research Papers?

Table 6: Main Authors Of Published Research Papers

Author	Organization	No. Documents
Wang Zhiqiang	Wenzhou University	3
Li Yayuan	Northeast Normal University	3
Song Zhishuai	Hefei Polytechnic University	3
Zhang Baoqiang	Henan University of Technology	3
Xu Xiaozhou	Zhejiang University	2
Jia Jianfeng	Northeastern University	2
Yan Huafei	Wuhan University of Engineering	2
Zhu Zhu Zhu	Liaoning University	2
Yi Weisong	Huazhong Agricultural University	2
Bao Mingxu	Changchun University of Traditional Chinese Medicine	2
Xiang Meilai	Wuhan University of Engineering	2
Liu Yi	Anhui Mechanical and Electrical Vocational and Technical College	2
Chen Wenhua	Shenzhen Institute of Information Technology	2
Li Chang	Northeast Normal University	2
Niu Yafei	Northeast Normal University	2
Lu Shanquan	Mount Huangshan University	2
Song Lulu	Huaiyin Institute of Technology	2

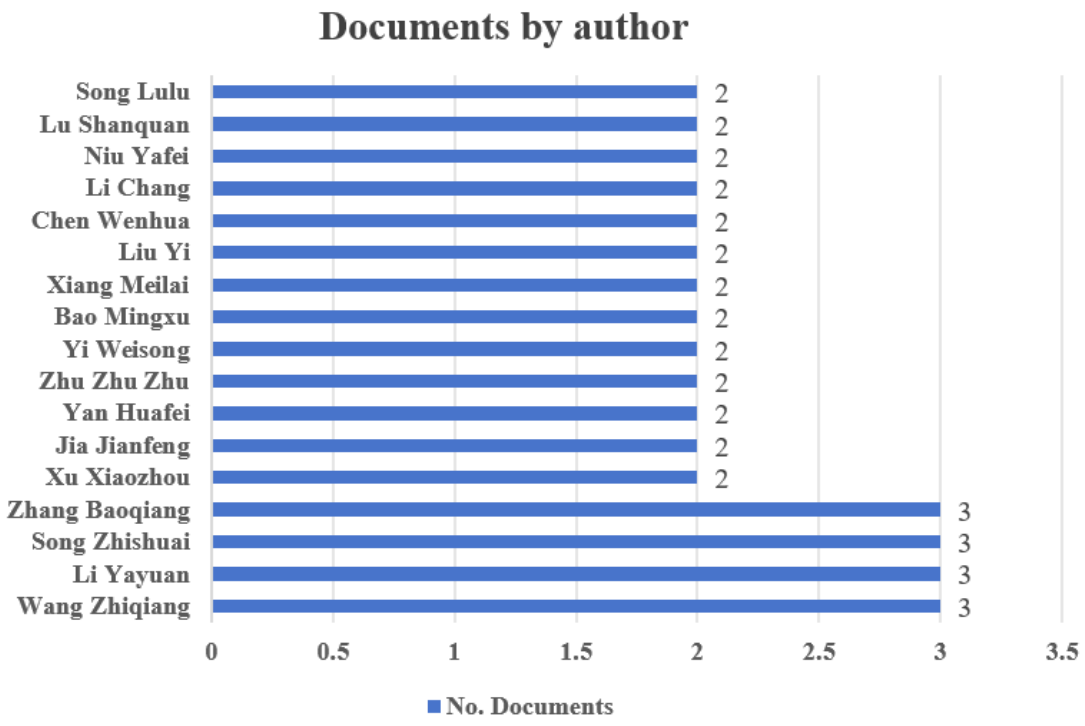

Figure 4: Main Authors Of Published Research Papers

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Analysed from the representative scholars, there are 17 scholars who have statistically published 2 or more papers. The authors with the most published papers are Wang Zhiqiang, Li Yafei, Song Zhishuai and Zhang Baoqiang (all with 3 papers), also from Wenzhou University, Northeast Normal University, Hefei University of Technology and Henan University of Technology, which are the institutions with the most published papers. Jia Jianfeng, Li Chang and Niu Yafei in Table 6 are all from Northeast Normal University (NENU), indicating that NENU has formed a research team led by the three of them. Yan Huafei and Xiang Meilai are both from Wuhan University of Engineering (WUE), indicating that the two of them have also formed a research team. There are 11 universities appearing in both Table 5 and Table 6. This indicates that Wenzhou University, Northeast Normal University, Huangshan College, Henan University of Technology, and Hefei University of Technology have published a high number of papers and have more significant research results in terms of the institutions that have published papers and the scholars they represent.

What Are The Top 10 Cited Articles In Research Papers?

Table 7: Key Information On Highly Cited Papers

No.	Cited by	Authors	Title	Year
1	184	Zhuo Zelin et al.	Construction of Innovation and Entrepreneurship Education Ecosystem in High-level Universities and Implications	2016
2	89	Xu Xiaozhou et al.	Towards 2050: Vision and Strategy of Innovation and Entrepreneurship Education Ecosystem Construction	2018
3	67	Zhang Qian et al..	The Construction of Innovation and Entrepreneurship Education Ecosystem in Universities Based on Collaborative Cultivation	2015
4	61	Yao Xiaoling et al.	Exploration of Innovation and Entrepreneurship Education Ecosystem in Stanford University, USA	2018
5	59	Li Yayuan et al.	Effectiveness and Prospect of Research on Ecosystem Construction of Innovation and Entrepreneurship Education in Colleges and Universities in China	2021
6	47	Li Yayuan et al.	Ideal Sample of Innovation and Entrepreneurship Education Ecosystem Construction in Colleges and Universities - Cross-Case Comparative Analysis Based on 8 Typical Colleges and Universities in 4 Countries	2022
7	44	Jia Jianfeng et al.	Construction of Innovation and Entrepreneurship Education Ecosystem in Colleges and Universities - Based on Multi-case Study of Colleges and Universities in the US, UK and Japan	2021
8	43	Sui Shanshan et al.	Exploration on the Path of Cultivating Innovative and Entrepreneurial Talents in China - Based on the Comparison of Foreign Experiences and the Perspective of Constructing the Ecosystem of	2018

Advanced International Journal of Business, Entrepreneurship and SME's
AIJBES
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DOI 10.35631/AIJBES.620023

			Innovative and Entrepreneurial Education	
8	43	Song Zhishuai et al.	Evolution History and Development Trend of China's Innovation and Entrepreneurship Education Ecosystem	2020
10	35	Cheng Xi et al.	Indicator Construction and Weighting Analysis of University Innovation and Entrepreneurship Education Ecosystems	2020

The 10 highly cited articles in the sample literature are detailed in Table 7. These 10 classic literatures were published in a relatively even distribution of time, with 1 article in 2015, 1 article in 2016, 3 articles in 2018, 2 articles in 2020, 2 articles in 2021, and 1 article in 2022, but mainly concentrated in 2018, 2020, and 2021. The quality of these 10 articles is very high, the number of citations is more than 35, and the highest one reaches 184.The existence of these classic articles has laid a solid foundation for the research in this decade, and has helped a lot of had innovative entrepreneurship education ecosystem researchers.

What Are The Top 10 Downloaded Research Papers?

Table 8: Key Information Of The Most Downloaded Papers

No.	Download	Authors	Title	Year
1	5834	Zhuo Zelin et al.	Construction of Innovation and Entrepreneurship Education Ecosystem in High-level Universities and Implications	2016
2	3795	Li Yayuan et al.	The Ideal Pattern of Innovation and Entrepreneurship Education Ecosystem Construction in Universities - A Cross-Case Comparative Analysis Based on 8 Typical Universities in 4 Countries	2022
3	3486	Xu Xiaozhou et al.	Towards 2050: Vision and Strategy of Innovation and Entrepreneurship Education Ecosystem Construction	2018
4	3246	Jia Jianfeng et al.	Construction of Innovation and Entrepreneurship Education Ecosystem in Colleges and Universities--A Multiple Case Study Based on Colleges and Universities in the United States, the United Kingdom, and Japan	2021
5	3144	Li Yayuan et al.	Effectiveness and Prospect of Research on the Construction of Innovation and Entrepreneurship Education Ecosystem in China's Colleges and Universities	2021
6	2703	Sui Shanshan et al.	Exploration on the Path of Cultivating Innovative and Entrepreneurial Talents in China - Based on the Comparison of Foreign Experiences and the Perspective of Constructing the Ecosystem of Innovation and Entrepreneurship Education	2018
7	2385	Yao	Exploration of Innovation and	2018

Advanced International Journal of Business, Entrepreneurship and SME's
AIJBES
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DOI 10.35631/AIJBES.620023

		Xiaoling et al.	Entrepreneurship Education Ecosystem of Stanford University in the United States	
8	1946	Song Zhishuai et al.	The Evolution and Development Trend of China's Innovation and Entrepreneurship Education Ecosystem	2020
9	1943	Bao Mingxu	Research on Innovation and Entrepreneurship Education Ecosystem in Digital Era - Based on Triple Helix Theory	2020
10	1769	Cheng Xi et al.	Indicator Construction and Weighting Analysis of University Innovation and Entrepreneurship Education Ecosystems	2020

There are 25 articles with more than 1000 downloads in the sample literature, including 7 articles with more than 2000 downloads. The authors selected the information of the top 10 downloaded articles to form Table 8. A comparison of the information in Table 7 and Table 8 shows that 9 articles are identical. This indicates that 90% of the articles are both highly cited and highly downloaded articles. It mutually verifies that these articles are high-quality classic articles. In terms of the time of publication, it is concentrated in 2018, 2020 and 2021. This indicates that these are foundational literature in the field of innovation and entrepreneurship education ecosystems, which is worthy of in-depth study by researchers.

Which Are The Top 10 Grant Programmes For Funded Research?

Table 9: Fund Projects That Fund The Top Ten Ranked Published Papers

Rankings	Fund projects	No. Documents
1	Project of Philosophy and Social Science Fund for Higher Education of Jiangsu Provincial Department of Education	9
2	Humanities and Social Sciences Research Project of Ministry of Education	5
2	National Natural Science Foundation of China	5
2	Industry-University Co-operation Collaborative Education Project of Ministry of Education	5
2	National Education Science Planning Project	5
6	Provincial Teaching Quality and Teaching Reform Project of Anhui Higher Education Institutions	4
6	Teaching Reform Research Project of Hunan Ordinary Higher Education Institutions	4
8	National Social Science Foundation	3
8	Teaching Reform Research Project of Higher Education in Henan Province	3
10	Jiangsu Province Social Science Fund Project	2
10	Heilongjiang Province Education Science Planning Project	2
10	Science and Technology Research Project of Jilin Education Department	2
10	Humanities and Social Sciences Research Project of Chongqing Municipal Education Commission	2

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The research most funded by fund projects is the Philosophy and Social Science Fund Project for Higher Schools of Jiangsu Provincial Department of Education, with a total of 9 articles. The national level includes 5 articles of education humanities and social sciences research projects, 5 articles of the National Natural Science Foundation of China, 3 articles of the Ministry of Education's Industry-University Cooperation Collaborative Breeding Project, 5 articles of the National Education Science Planning Project, and 3 articles of the National Social Science Foundation Project Literature. Among the relevant topics of each province, Jiangsu, Anhui and Hunan ranked in the top three in terms of fund support. Among the 13 funds ranked in the top ten, there are 11 funds in Jiangsu Province, accounting for 18%, which is a very large proportion, which is particularly prominent among the fund grants of all provinces. This is in keeping with Jiangsu Province's large GDP, active economy, and good environment for innovation and entrepreneurship.

Discussion and Conclusion

The bibliometric analyses revealed the trends and characteristics of the research field of innovation and entrepreneurship education ecosystem in China. Through the above analyses, this study obtained the following conclusions.

The temporal distribution of the number of publications shows that it began to increase gradually in 2016 and levelled off after reaching a peak in 2020. This is closely related to the fact that China began to attach great importance to and introduce a series of strategic initiatives in 2015. Under the guidance of the national strategy, the research on innovation and entrepreneurship education ecosystem will continue to maintain a high level of attention.

From the perspective of research themes and discipline distribution, the research focuses on higher education and vocational education, and the hot topics include innovation education ecosystem, innovation and entrepreneurship education, ecosystem, innovation and entrepreneurship education in colleges and universities, innovation and entrepreneurship, ecosystem construction.

From the perspective of published article institutions, number, journals and authors, universities are the main research force, with Huangshan College, Wenzhou University, Northeast Normal University and Henan University of Technology being the most influential. Three authors ranked first in the number of published articles are from Wenzhou University, Northeast Normal University and Henan University of Technology, and three scholars from Northeast Normal University are among the authors with more than two published articles. The journals that publish the most articles are education journals, mainly "Innovation and Entrepreneurship Theory Research and Practice", "Journal of Heilongjiang Institute of Education" and "Education Modernisation".

In terms of the number of citations and downloads of published articles, nine articles overlapped in the top ten of highly cited articles and the top ten of highly downloaded articles, indicating that high-quality research results are very concentrated. It is also found that high-quality articles are clustered in the three years of 2018, 2020, and 2021.

In terms of the funding funds and source categories of the literature, the National Natural Science Foundation of China, Educational Humanities and Social Sciences Research Project, Ministry of Education Industry-University Cooperation Collaborative Breeding Project and

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Jiangsu Provincial Fund are the main funding sources. Meanwhile, 21.5% of the literature was included in the PAUC database, indicating that the quality of the research results is still to be improved and the influence is not enough.

Future research is recommended to focus on the specific problems existing in the university innovation and entrepreneurship education ecosystem so as to optimize it in a timely manner and promote university innovation and entrepreneurship education.

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