

Literature Analysis of Science and Engineering Journals in Jilin Province's "Double First Class" Construction Universities from 2020 to 2024

Shen Zhang, Chen Tang, Huiru Zheng *

School of Civil Engineering, Changchun Institute of Technology, Changchun Jilin, 130012, China

* Corresponding author: Huiru Zheng

Abstract

Journal of Jilin University (Engineering Edition) (Journal A), Journal of Jilin University (Science Edition) (Journal B), Journal of Northeast Normal University (Natural Science Edition) (Journal C) and Journal of Yanbian University (Natural Science Edition) (Journal D) were taken as research objects, the basic information of journals was introduced, the trend of publication, the proportion of funded articles, the distribution of disciplines, relevant institutions and related keywords in the journals from 2020 to 2024 were analyzed. The results show that with the increase of years, the publication volume of Journal A shows an increasing trend, while the publication volume of Journals B and C shows a decreasing trend, and the publication volume of Journal D first decreases and then increases. In these five years, the average annual publication volume and average publication volume per issue of Journal A and Journal B are relatively high. The proportion of funded articles in Journal A, B and C is higher than 90%. Mathematics, computer software and computer applications, and automation technology account for a larger proportion in journals. The number of articles published by universities in their journals is significantly higher than that of other institutions. The top three keywords in Journal B and Journal C are exactly the same.

Keywords

Journal; Number of Publication; Trend of Publication; Discipline.

1. Introduction

In September 2017, the Ministry of Education, the Ministry of Finance, and the National Development and Reform Commission of the People's Republic of China jointly issued a notice on the announcement of the list of world-class universities and first-class discipline construction universities and disciplines. The list of "Double First Class" construction universities was officially confirmed and announced, including 42 first-class university construction universities and 95 first-class discipline construction universities. The Double First Class Initiative, abbreviated as "Double First Class", is a major strategic decision made by the Central Committee of the Communist Party of China and the State Council. The construction of "Double First Class" is another national strategy in the field of higher education in China, following the "985 Project" and "211 Project". It is a new plan that is conducive to enhancing the comprehensive strength and international competitiveness of China's higher education, providing strong support for achieving the "Two Centenary Goals" and realizing the Chinese Dream of national rejuvenation. Jilin University has been selected as a first-class university construction university among universities in Jilin Province, while Northeast Normal University and Yanbian University have been selected as first-class discipline construction universities.

University journals are important tools and platforms for scientific research and teaching activities in universities, and have significant implications for discipline development, academic exchange, and talent cultivation [5-7]. University journals cover natural sciences, social sciences, humanities and other fields, emphasizing invention and creation, innovation of achievements, conclusion argumentation, promoting discipline development, teaching improvement and ideological progress, ultimately serving talent cultivation, economic development and social construction. As one of the important channels for publishing scientific research achievements, the function of university journals in serving economic development and social construction cannot be underestimated. Wang Yanan, former president of Xiamen University (a renowned modern Chinese economist and educator), believed that the main focus of running a university is twofold: teaching and running a journal. It can be seen that the status and role of academic journals in universities are crucial.

In order to study the quality, level, and characteristics of science and engineering journals in Jilin Province's "Double First Class" construction universities, "Journal of Jilin University (Engineering Edition)", "Journal of Jilin University (Science Edition)", "Journal of Northeast Normal University (Natural Science Edition)", and "Journal of Yanbian University (Natural Science Edition)" were selected as research objects. Firstly, the basic information of each journal was introduced, and then the publication trend analysis, funding article analysis, discipline distribution analysis, relevant institution analysis, and relevant keyword analysis of papers published in each journal from 2020 to 2024 were conducted.

2. Basic Information of the Journal

Table 1. Basic information of each journal

Journal name	Journal of Jilin University (Engineering Edition)	Journal of Jilin University (Science Edition)	Journal of Northeast Normal University (Natural Science Edition)	Journal of Yanbian University (Natural Science Edition)
Organizer	Jilin University	Jilin University	Northeast Normal University	Yanbian University
Publishing cycle	Monthly	Bimonthly	Quarterly	Quarterly
ISSN	1671-5497	1671-5489	1000-1832	1004-4353
CN	22-1341/T	22-1340/O	22-1123/N	22-1191/N
Founding date	1957	1955	1951	1962
Album Title	Engineering Technology II	Basic Sciences	Basic Sciences	Basic Sciences
Topic Name	Comprehensive Technology Class B Comprehensive	Comprehensive Basic Science	Comprehensive Basic Science	Comprehensive Basic Science
Volume of published literature	9037	8219	5037	2580
Total number of downloads	3022701	1162254	940846	379660
total citations	104986	39713	33518	8385
Composite influencing factor	2.83	1.12	0.92	0.28
Comprehensive influencing factors	1.55	0.79	0.56	0.13
Database inclusion status	1)2)3)4)5)8)	1)2)5)6)7)8)	1)2)8)	1)

Note: (1) In the database inclusion status, 1) represents CAS Chemical Abstracts (USA) (2025); 2) Representing JST Japan Science and Technology Agency Database (Japan) (2025); 3) Representative EI Engineering Index (USA) (2025); 4) Representing the source journals of CSCD China Science Citation Database (2023-2024); 5) Representing the source journal of the WJCI Technology Journal World Impact Index Report (2024); 6) Representing INSPEC Scientific Abstracts (English) (2025); 7) Representing P * (AJ) Digest Magazine (Russia) (2020); 8) Representing Peking University's "Overview of Chinese Core Journals" (2023 edition). (2) The deadline for the publication volume, total downloads, and total citations is June 2025.

Table 1 shows the basic information of each journal, including the host organization, publication cycle, ISSN number, CN number, founding date, album name, topic name, published literature volume, total downloads, total citations, impact factors, and database inclusion status. Composite impact factor and comprehensive impact factor are both indicators for measuring the quality and impact level of journals. Their statistical sources are different. Composite impact factor is suitable for preliminary evaluation of journals, while comprehensive impact factor can be used to evaluate the research level and impact of journals or disciplines. It is generally believed that the larger the impact factor, the better the quality and level of influence of the journal [9-10]. From Table 1, it can be seen that the order of composite impact factor and comprehensive impact factor from highest to lowest is Jilin University Journal (Engineering Edition)>Jilin University Journal (Science Edition)>Northeast Normal University Journal (Natural Science Edition)>Yanbian University Journal (Natural Science Edition). It can be seen that the quality of the Journal of Jilin University (Engineering Edition) is good, while the quality of the Journal of Yanbian University (Natural Science Edition) needs further improvement. For ease of description, the following journals are referred to as Journal A, B, C, and D in descending order of their impact factors.

From Table 1, it can also be seen that Journal A is a monthly publication, Journal B is a bimonthly publication, while Journal C and Journal D are quarterly publications with longer publication cycles than monthly and bimonthly publications. From the founding date, it can be seen that Journal C was founded earlier, followed by Journal B, A, and D. The founding dates of each journal have all exceeded 60 years, indicating a long history of publication. The album names and topic names of journals B, C, and D are the same, but different from journal A, indicating that the research content of the journals of Northeast Normal University and Yanbian University in the Natural Science Edition is more inclined towards science rather than engineering.

By analyzing the number of published articles, total downloads, and total citations in the journal, it can be seen that the values of all three gradually increase with the increase of the journal's impact factor.

According to the analysis of journal inclusion in databases, Journal A and Journal B are both included in 6 databases, followed by Journal C (3 databases) and Journal D (1 database). Among them, Journal A is a journal included in the EI Engineering Index database, with high quality and influence. Journals B and C are included in Peking University's "Overview of Chinese Core Journals", with second highest quality and influence. Journal D is a general public publication with average quality and influence. It can be seen that the above analysis is consistent with the analysis of influencing factors.

3. Journal Literature Analysis

3.1. Trend Analysis of Posting

Fig. 1 shows the publication trends of various journals from 2020 to 2024. It can be seen that the publication volume of Journal A remained relatively stable in 2020 and 2021, and gradually increased after 2022. The publication volume in 2024 increased by 16.7% compared to 2022; In addition, the publication volume of 342 articles in 2022 is significantly higher than the previous two years' around 260 articles. This is because the Journal of Jilin University (Engineering Edition) will adjust its publication cycle from bimonthly to monthly in 2022, shortening the publication cycle and increasing the publication period. The publication volume of journals B and C in the past five years has shown a decreasing trend with the increase of years. Journal B's publication volume in 2024 decreased by 25.3% compared to 2020, while Journal C's publication volume in 2024 decreased by 14.5% compared to 2020. Although the publication volume in 2021 has increased compared to 2020, it does not affect the overall trend.

The publication volume of Journal D remained relatively stable from 2020 to 2022, followed by a decrease and then an increase. In 2024, the publication volume increased by 31.8% compared to 2022. In the average annual publication volume of the past five years, journals A, B, C, and D have 329, 206, 91, and 70 articles respectively; In the average publication volume of each issue in the past five years, Journal A, B, C, and D have 34, 34, 23, and 17 articles respectively. It can be seen that both Journal A and Journal B have a higher average annual publication volume and publication volume per issue. Journal A has the highest average annual publication volume, which is 4.7 times that of Journal D; Journal A and B have the highest average publication volume per issue, which is 2.0 times that of Journal D.

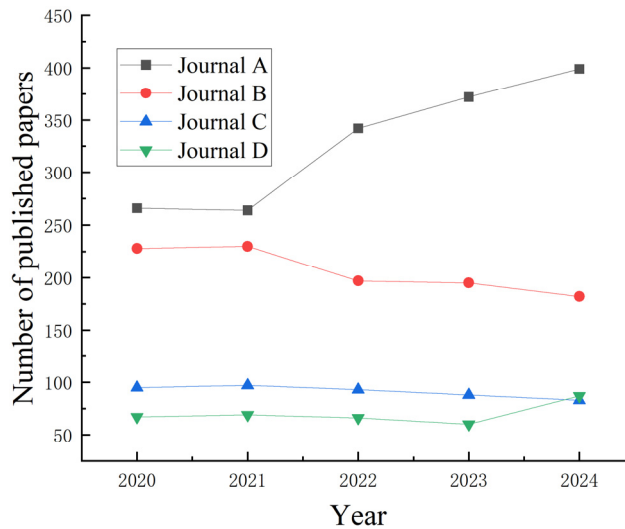


Fig 1. Publication Trends of Various Journals from 2020 to 2024

3.2. Analysis of Funded Articles

Fig. 2 shows the percentage of articles funded by grants in the total annual publications of each journal from 2020 to 2024. It can be seen that the proportion of funded articles in journals A, B, and C in each year is over 90% (with individual years in journals A and C accounting for as much as 99%), indicating that journals A, B, and C have a high demand for project funds and good article quality. The proportion of funded articles in Journal D has gradually increased from 76% in 2020 to 84% in 2024, indicating that its demand for project funds was low in the early stages, but gradually improved, and the quality of articles has become better and better.

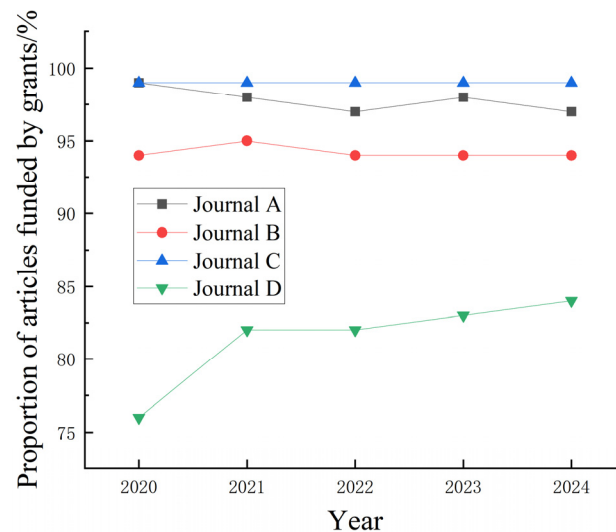


Fig 2. Proportion of articles funded by various academic journals from 2020 to 2024

3.3. Analysis of Discipline Distribution

The percentage of publications in different disciplines in journals A, B, C, and D from 2020 to 2024 can be obtained through CNKI search on China National Knowledge Infrastructure. Analysis shows that the top three disciplines in Journal A are highway and waterway transportation, automation technology, computer software, and computer applications, accounting for 21%, 19%, and 18% respectively; The top three disciplines in Journal B are mathematics (41%), computer software and computer applications (17%), and automation technology (13%); The top three disciplines in Journal C are mathematics (36%), computer software and computer applications (16%), and automation technology (11%); The top three disciplines in Journal D are mathematics (35%), physics (16%), and automation technology (11%). It can be seen that there are a large number of research papers on mathematics, computer software and applications, and automation technology in various engineering journals.

3.4. Analysis of Relevant Institutions

The distribution of relevant institutions in journals A, B, C, and D from 2020 to 2024 can be obtained through CNKI search on China National Knowledge Infrastructure. Analysis shows that the institution with the highest publication volume of Journal A from 2020 to 2024 is Jilin University, followed by Chang'an University, and Tongji University, with publication volumes of 481, 63, and 53 respectively; The top three institutions in terms of publication volume of Journal B from 2020 to 2024 are Jilin University (230 articles), Northwest Normal University (94 articles), and Changchun University of Technology (52 articles); The top three institutions in terms of publication volume of Journal C from 2020 to 2024 are Northeast Normal University (108 articles), Xinjiang University (47 articles), and Jilin University (27 articles); The top three institutions in terms of publication volume of Journal D from 2020 to 2024 are Yanbian University (152 articles), Putian College (18 articles), and Liming Vocational University (17 articles). It can be seen that the publication volume of each university in each journal is the highest, and significantly higher than other institutions.

3.5. Analysis of Related Keyword

The distribution of relevant keywords in the literature of journals A, B, C, and D from 2020 to 2024 can be obtained through CNKI search on China National Knowledge Infrastructure. Analysis shows that the top three keywords in the literature of Journal A from 2020 to 2024 are "Vehicle Engineering" (162 articles), "Computer Applications" (109 articles), and "Transportation System Engineering" (86 articles); The top three keywords in Journal B are "Deep Learning" (30 articles), "Convolutional Neural Networks" (24 articles), and "Attention Mechanisms" (23 articles); The top three keywords in Journal C are "Deep Learning" (15 articles), "Convolutional Neural Networks" (12 articles), and "Attention Mechanisms" (8 articles); The top three keywords in Journal D are "stability" (7 articles), "cavity magnetic mixing system/antioxidant/fluorescent powder/controlled sputtering" (5 articles), and "traveling wave solution/neural network/high-performance liquid chromatography/magneton induced transparency/deep learning" (4 articles). It can be seen that the top three keywords of Journal B and Journal C are completely consistent, with Journal D having the same keyword of "deep learning", while the other keywords are different.

4. Conclusion

By introducing the basic information of Journal of Jilin University (Engineering Edition) (Journal A), Journal of Jilin University (Science Edition) (Journal B), Journal of Northeast Normal University (Natural Science Edition) (Journal C), and Journal of Yanbian University (Natural

Science Edition) (Journal D), as well as analyzing the literature of each journal from 2020 to 2024, the following conclusions are drawn:

- (1) Compared with journals A, B, and C, journal D has a lower impact factor and is less frequently included in databases. Its quality and level of influence need to be further improved.
- (2) With the increase of years, the publication volume of Journal A shows an increasing trend, while the publication volume of Journals B and C shows a decreasing trend, and the publication volume of Journal D first decreases and then increases.
- (3) The average annual publication volume of each journal in the past five years is ranked as $A > B > C > D$, and the average publication volume of each issue is ranked as $A = B > C > D$.
- (4) Journals A, B, and C have a high demand for project funds, with funding for articles accounting for over 90%; Journal D had a low demand for project funding in the early stages, and the proportion of articles funded by the funding has been increasing year by year.
- (5) In the past five years, the disciplines of mathematics, computer software and computer applications, and automation technology have accounted for a relatively large proportion in various journals. The number of publications in each university's journal is significantly higher than that of other institutions. The main keywords ranking in the top three of Journal B and Journal C are exactly the same.

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