

Discipline Structures and Strategic Positioning: A Cross-Alliance Study of Top-Tier University Consortia

Miaomiao Liu ¹, Bin Dong ², Yuhang Li ^{3,*}

¹ Social Science Research Institute, Dalian Maritime University, Dalian 116025, China

² Science and Technology Department, Dalian Maritime University, Dalian 116025, China

³ School of Economics and Management, Dalian University of Technology, Dalian 116024, China

*Corresponding Author

Yuhang Li

674810922@qq.com

Received: 25 July 2026 / Accepted: 16 August 2026 / Published online: 18 August 2026

Abstract

The world's top four research university alliances were selected as research objects, and comparative analysis method was used to compare and analyze the scientific research productivity, scientific research influence and cooperation, and discipline group structure of the university alliances. The overall profile and main characteristics of the disciplines of the university alliances would reveal the gaps and characteristics of the disciplines of the international top university alliances. The research results show that the IVY University Alliance has the highest impact on standardized citations and the impact of disciplines relative to the global average level. The RG university alliance has the highest number of scientific research papers and the highest degree of international cooperation papers. The paper output of the C9 university alliance increased the fastest. The four university alliances differ greatly in the presentation of the discipline group structure.: Among the superior disciplines of the IVY, RG, and Go8 university alliances, clinical medicine has the most outstanding performance. The C9 university alliance has the most outstanding performance in material science. The study found that maintaining close links between scientific research and international frontiers, optimizing the structure of disciplines, and creating more peaks in discipline clusters have important enlightenment values for the development of university alliances.

Keywords: University Alliances; First-Class Discipline; Scientific Research Output; Scientific Research Influence

1. Introduction

University alliance refers to a flow of loose union builded by two or more universities which have a common strategic goal and established by agreement or alliance. It is a advantage

complementary, resource sharing, risk sharing, multi-directional union. The alliance between universities is an important form and effective way to jointly obtain resources, exchange resources with each other, and promote their respective development. Competitive Advantage Theory believes that the basis for an organization to obtain a competitive advantage is the organization's ability and resources, and the core competence based on resources and capabilities is the source of competitive advantage (Leonard-Barton, 1992). The characteristics of the university alliance are mainly reflected in three aspects: value, stability, and development.

The main reasons for establishing alliances between universities are as follows, obtaining resources in the docking of national policies and obtaining resources in conjunction with other universities. Carrying out strategic alliances among universities and other social organizations will not only help universities concentrate their limited educational resources and strengthen the construction of key links, but also help organizations with different advantages complement cooperate with each other.

No matter how complete discipline categories of a university, it can not achieve a leading position in every discipline area. In the system of university alliances, compared with other universities, the human resources and academic resources of each university are all heterogeneous resources. These heterogeneous resources will bring new core competitiveness to the universities in the alliance, thereby these universities will gain a competitive advantage over other universities and enhancing the overall strength of them. Obviously, improving national scientific and technological capabilities and strength cannot only depend on the strength of a certain field or a certain university. It requires the construction and development of a group of first-class universities and disciplines.

Four top university alliances were selected as the research object in this study. Comparative analysis method was employed to compare and analyze the top-ranked disciplines, research productivity, research influence and cooperation, and discipline group structure of the university alliance. The aim of this research is to explore the overall profile and main characteristics of a group of top research-oriented disciplines of university alliances in the world, and then reveal the gaps and characteristics of the top international disciplines of university alliances.

2. Related Work

2.1. Research on University Alliance

Educational sociologist Pierre Bourdieu (Wacquant, 1989) emphasized that the essence of the university strategic alliance is the dynamic process of structural evolution in the field of higher education. Professor Andrew (Gunn & Mintrom, 2013) of the University of Leeds in the United Kingdom has researched and counted more than 20 international alliances of various regionals and global universities. Inkpen (Inkpen, 2000) clearly pointed out that the alliance is a good way to obtain tacit knowledge. Alliance partners learned experience independently or through zero-sum games, so that all partners can gain value.

Through resource coordination, exchanging and sharing between alliance members, scale development can be achieved, the sustainability of inter-disciplines can be improved, and the reputation and influence of alliance members in the field of the alliance and in the international field can be improved, and more resources can be won for their own development and opportunity (Teichler, 2009). The interdependence of resources is the fundamental reason for establishing a strategic alliance, and the sharing and interdependence of resources can create the value of "1+1>2" (Prahalad & Hamel, 1990). However, the actual operating results of most strategic alliances are lower than expected, and the sustained momentum for development is insufficient. Nearly half of the strategic alliances ended in failure (Kale, 2002). Resource Dependence Theory believes that an organization is an open system, and needs to obtain a large number of scarce and precious resources from the external environment (Dimaggio & Powell, 1983). When an organization obtains resources, it depends on the professional field which it belongs. The professional field determines the type of resources it needs (Dahlin & White, 1963). Therefore, the closer the organizations are in the professional field, the greater the value of resource exchange between them, the stronger the foundation for cooperation, and the more depth and breadth of cooperation; otherwise, conflicts will arise. Contradictions are not conducive to cooperation between organizations (Biermann, 2008).

From a cultural perspective, the cultural identity and integration of strategic alliances among universities contributes to the formation of alliance relationships (Fedor, 1995). Cultural conflict will affect the development and stability of the alliance, and cultural distance will hinder the formation and operation of the alliance (Buckley 1996). Cultural misunderstandings can lead to distortions in the transmission of information and knowledge. Therefore, maintaining cultural sensitivity helps to increase the trust of both sides of the alliance (Saffu, 1999).

2.2. Discipline Evaluation Research

Internationally, the institutions for disciplinary evaluation include QS, ESI, etc. Each ranking agency classifies and weights the disciplinary evaluation indicators. ESI is built on the SCI and SSCI database. Through various indicators such as high-cited institutions, high-impact mechanics, and high-cited papers, different sorting criteria such as 1% and 5% are set to count different countries, disciplines, and scientific performance of institutions, papers, scholars (Klein & Chiang, 2004). The top 1% of ESI disciplines mainly use the number of published papers, citations and average citation of papers to rank the level of disciplines. Price (1965) first proposed to probe the research front based on highly cited papers and characterize the research front as a recently published and frequently cited paper collection. In the related research of evaluating countries and institutions based on research frontiers, Igami (2007), Mukherjee (2001), Starodubov (2012), Sun (2016) and other scholars did some research on comparatively analyzes of the performance of different countries and institutions on the research front from the aspect of the research frontier contribution (number of core papers), attention (number of cited papers), international cooperation (number of international collaborative papers). In addition, 75% of the data used in the American Newsweek Global University Rankings is derived from literature measurement data, including the number of academic papers, the number of citations per article, and the number of highly cited papers. The evaluation of the research strength of universities in specific discipline

areas is based on the output of scientific research results (Morse, 2009). The index design of many university or discipline rankings focuses on "research output", "internationalization" and other aspects (UNESCO, 2005). The internationalization trend of higher education has integrated the international dimension into the whole process of university personnel training, scientific research and service functions (KNIGHT, 1995).

Although researchers on discipline evaluation are highly controversial, the positive impact of discipline evaluation cannot be ignored. On the basis of reflection and criticism, the current evaluation status has many areas which need to be standardized and improved. By analyzing the course of discipline evaluation, combining with different appraisal methods and practical experience, the discipline category evaluation is effectively carried out, and the continuous formation of a scientific evaluation model is an inevitable product of social development.

3. Data Sources and Methods

3.1. Data Sources

The ESI (Essential Scientific Indicators) database is an authoritative tool for collecting and reflecting citations of papers from 22 major disciplines in various countries introduced by ISI US Science and Technology Information.

It can fully reflect the quality of papers and international competitiveness of various academic institutions. ESI has been widely used in academic evaluation and analysis by academia, mainly because of internationally available databases, comprehensive data sources (Web of Science), mature platforms (InCites, ESI), and reliable indicators (CNCI) etc. The 22 disciplines divided by ESI are arranged in alphabetical order as follows, Agricultural Science, Biology & Biochemistry, Chemistry, Clinical Medicine, Computer Science, Economics & Business, Engineering, Environment/Ecology, Geosciences, Immunology, Materials science, Mathematics, Microbiology, Molecular Biology & Genetics, Multidisciplinary, Neuroscience & Behavior, Pharmacology, Physics, Plant & Animal Science, Psychiatry/Psychology, Social Sciences--general, Space Sciences.

Table 1. Information of the four major university alliances

Alliance name	Alliance Abbreviation	Number of members	Established	Country	District
The Ivy League	IVY	8	1954	the United States	America
The Group of Eight	Go8	8	1999	the United Kingdom	Oceaniaand
The Russell Group	RG	24	1994	Australia	Europe
The China Nine Schools Alliance	C9	9	2009	China	Asia

This study selected ESI data from 2015 to 2025. The main evaluation indicators are Productivity, Impact, and Collaboration. The selected research objects are the American Ivy League (Ivy league, Ivy), the British Russell University League (The Russell Group, RG), the Australian Eight School Alliance (Group of Eight, Go8), the Chinese Nine School Alliance (C9). There are 49 universities (Table 1). The four alliances are from Asia, North America, Europe, and Oceania. They basically cover all regions of the world that are advanced in higher education. And the universities included in these alliances are all leaders in research universities in their regions, so it is a typical representative of the top research university alliances in various regions of the world.

3.2. Methods

This comparative research takes each university alliance as a analysis unit, selects the top four university alliances and compares the first-class disciplines of the university alliances. We analyzed the scientific research productivity, scientific research influence and cooperation, disciplinary group structure differences, and then analyzed the overall difference of disciplines in the university alliances. Among them, the number of first-class disciplines represents the strength and popularity of the school's disciplines, scientific research is one of the most important functions of the university, and the quantity and quality of scientific research output represent the university's scientific research level. The level of scientific research influence represents the influence of disciplines; the structure of discipline group represents the layout structure of disciplines.

The overall profile and main characteristics of a group of the world's top university alliances were analyzed through the comprehensive comparative analysis of the alliance. We compared the advantages and gaps between top university alliances, and summarized the implications from the world's top university alliances for domestic and foreign scholars.

4. Comparative Analysis of the First-Class Disciplines in the Four Major Alliance Universities

4.1. Analysis of Scientific Research Output Scale

In scientometrics research, the number of published papers is usually used to measure the scale of scientific research output. The total number of citations and the average number of citations per article reflect the overall academic influence and quality of scientific research achievements. Table 2 presents the research output and influence indicators of the four university alliances from 2015 to 2025. In terms of the scale of scientific research output, the Russell Group in the UK has the highest total number of papers, reaching over 1.37 million, which is significantly ahead of other alliances. The China C9 University Alliance ranked second with over 1.12 million papers, demonstrating the rapid increase in the scale of scientific research output over the past decade. In contrast, the number of papers published by the Ivy League in the United States and the Go8 Alliance in Australia is relatively low, at 790,000 and over 620,000 respectively.

In terms of academic influence indicators, the Russell Group also maintains its leading position with a total citation count of over 43.9 million. The Ivy League ranked second with over 28.19 million times, while the C9 League followed closely with over 26.88 million times. The gap among the three has relatively narrowed. In terms of average citations per article, the Ivy League of the United States has an average citation rate of 35.6, significantly higher than other alliances, demonstrating its advantages in the quality and influence of individual research achievements. The average citations of the Russell Group and the Go8 Alliance are 31.9 and 29.5 respectively, while the average citation of the C9 alliance is 23.9, still showing a certain gap (Table 2).

Overall, the C9 University Alliance in China has taken the lead globally in terms of the scale of paper output. However, in terms of research influence, especially the average citations per paper, it still lags behind the Ivy League and the Russell Group. This indicates that while the C9 alliance universities are expanding their research scale, they also need to further enhance the output of high-quality achievements to strengthen their influence and competitiveness in the international academic community.

Table 2. Comparison of scientific research output indicators of the four major alliances

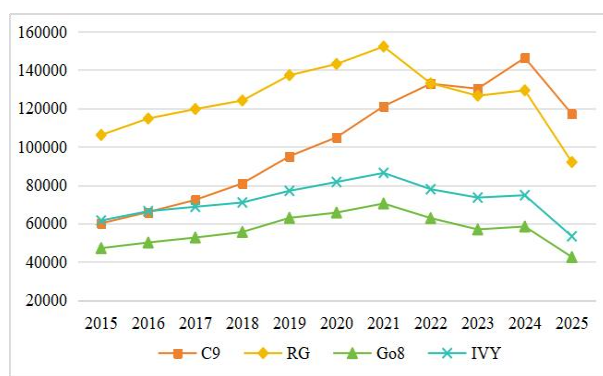
Alliance Abbreviation	Year of publication	Number of papers	Citations	Papers Cited
C9	2015-2025	1126776	26881618	23.9
RG	2015-2025	1378107	43903039	31.9
Go8	2015-2025	625134	18464373	29.5
IVY	2015-2025	791949	28194466	35.6

Figure 1 shows the overall trend of research paper output of the four university alliances from 2015 to 2025. Overall, the number of papers in each alliance has shown a trend of first rising and then slightly declining, but there are significant differences in growth rate and scale. Among them, the Russell Group of the UK maintained the highest level of scientific research output throughout the entire period and continuously held a leading position. The number of papers published by the C9 University Alliance in China has grown most rapidly, with a significant increase. Over the past decade, its research capacity has continuously expanded and gradually approached that of the Russell Group in the later stage, demonstrating a strong development momentum. The overall output scale of the Ivy League in the United States has maintained a relatively stable level, but the growth rate is limited and has declined to some extent in the later stage. The gap with the C9 League in China has gradually narrowed. In contrast, the number of papers published by the Australian Go8 consortium in each year has consistently been at the lowest level among the four major consortia, and the growth rate has also been relatively limited. Overall, the scale of scientific research output of the four major alliance universities has been continuously expanding,

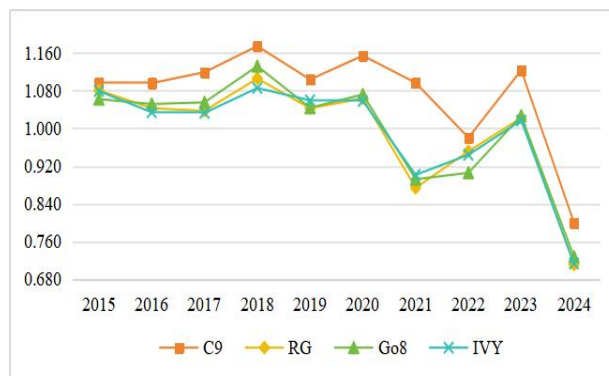
but the growth of the C9 alliance in China is particularly prominent, with its scientific research strength showing a significant upward trend among international university alliances.

As shown in Figure 2, the growth rate of articles published by each alliance was relatively stable in the early stage, fluctuated in the middle stage, and generally declined in the later stage. However, there are significant differences in the growth rate performance among different alliances. The growth rate of papers in the China C9 University Alliance has shown a higher growth trend than that of other alliances in multiple stages, demonstrating its continuous driving force for the expansion of scientific research output. The growth rate of the Australian Go8 university alliance had a slight edge in the early stage, approaching that of the C9 alliance and once exceeding that of the Russell Group and the Ivy League. However, in the middle and later stages, the growth rate declined more significantly and the advantage was no longer prominent. The growth rates of the Ivy League in the United States and the Russell Group in the United Kingdom have been relatively moderate overall, with limited fluctuations in most years, and they are generally in the second tier. From an overall trend perspective, although the growth rates of the four major alliances all declined in the later stage, the growth performance of the C9 alliance remained the most prominent, indicating that it has stronger growth potential in enhancing the intensity of scientific research output. In contrast, the scientific research expansion of the other alliances has relatively stabilized or slowed down.

The differences in the scale and growth rate of paper output among various alliances mainly stem from the variations in the structure of scientific research systems and the focus of evaluation. The Russell Group has obvious scale advantages, but its system tends to be stable and its growth momentum is limited. The Ivy League and the Go8 Alliance place more emphasis on the quality of scientific research, and thus their publication expansion is relatively moderate. The outstanding growth rate of the C9 Alliance is closely related to the quantity-oriented quantitative assessment standard in China and the continuously increasing investment in scientific research.



**Figure 1. Comparison of the number of papers issued
 By universities in the four major alliances**



**Figure 2. Comparison of the growth rate of the
 four major leagues' papers**

Note: Figure 2 The paper increase = the next stage value / the previous stage value. The first stage value is the ratio of the 2016 value to the 2015 value, the second stage value is the ratio of the 2017 value to the 2016 value, and so on, and the tenth stage value is the ratio of the 2018 value to the 2017 value.

The total number of papers in RG university alliance is much higher than other alliances. The main reason is that the number of RG university alliance members is larger than other alliances, but the growth rate of papers is still far behind that of the other three university alliances.

4.2. Analysis of the Academic Influence of University Alliances

Scientific research influence is an important indicator to measure the quality of scientific research, and represents the international influence of a certain discipline. Therefore, this research uses three indicators to reflect the influence of academic research which are the percentage of international cooperation papers, the influence of discipline normative citations, and the influence relative to the global average.

Whether in the field of natural sciences or humanities and social sciences, cooperation is indispensable. Cooperation is essentially a symbiotic connection. The deeper the level of scientific research cooperation, the clearer the rules of cooperation, the stronger the foundation of the cooperation culture, and the quality of scientific research results will continue to improve (Cantor, 2010). The university is an open organization. The internationalization of higher education has become an important indicator of the development of a country's education in the world. It is also a necessary trend for the development of universities. The level of international cooperation papers has become an important factor which affects the development of discipline.

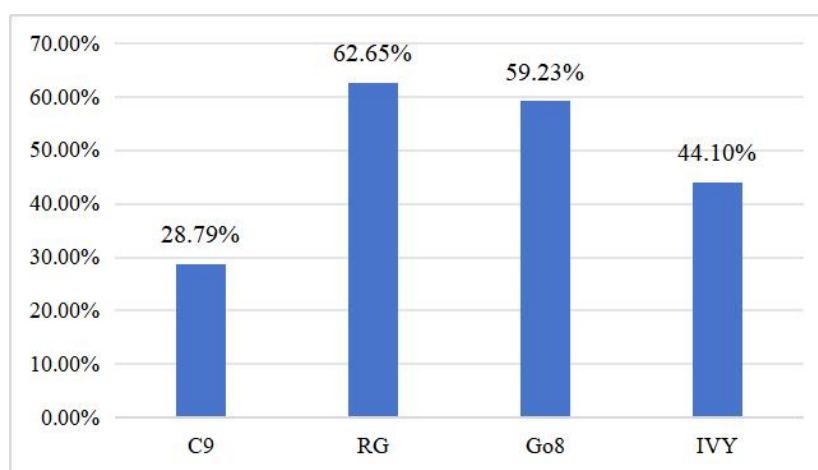


Figure 3. The average percentage of international cooperation papers of the four major alliances in 2015-2025

From the perspective of international collaborative papers, the statistics in Figure 3 show that there are significant differences among the four university alliances in terms of the proportion of international collaborative papers. The Russell Group of the UK and the Go8 Alliance of Australia have the highest proportion of international cooperation, both exceeding half, indicating that their scientific research activities are deeply integrated into the global cooperation network. The proportion of cooperation among the Ivy League in the United States is moderate, while the proportion of international cooperation among China's C9 alliance is the lowest, indicating that the international connectivity of its scientific research system is limited. International cooperation not only helps improve the quality of scientific research output but also enhances the academic influence of papers. Therefore, the differences in cooperation to some extent reflect the position of each alliance in the global scientific research system. Although the C9 Alliance has been

continuously enhancing its international awareness and academic exchanges, its substantive in-depth scientific research cooperation still needs to be further strengthened to improve its international scientific research competitiveness and academic influence.

When using the Incites platform for the analysis of the level of discipline influence, it is necessary to normalize the indicators. There are three main reasons, 1) The frequency of citations in different disciplines is very different, so it needs to be normalized. 2) Citations are dynamically changing and will continue to grow over time, so it is not suitable to compare articles published in different time periods for comparison. 3) The citation behaviors of articles in different types of documents are also different. Usually, the citations obtained from a article are less than a review, and the normalization of document types is required.

The Category Normalized Citation Impact indicator excludes to a certain extent the deviation of publication year, subject area and document type. Required journal type is "Article".

$$CNCI = \text{Times Cited} / \text{Category Expected Citations}$$

If $CNCI > 1$, it means that its citation influence has exceeded the global average; if $CNCI < 1$, it means that the citation influence is less than the global average.

From the perspective of the discipline standardized citation influence presented in Figure 4, the Ivy League has a relatively high discipline standardized citation influence, followed by the Russell Group and the G8 University Alliance in the UK, while the C9 University Alliance in China has the lowest discipline standardized citation influence. The main reason for the lowest influence of discipline standardization citations in the China C9 University Alliance is that under the evaluation system that is "academically oriented" and overly dependent on quantitative assessment, the vast majority of university teachers have been pushed onto the fast track of quick output and high output, making the output of these achievements strongly simplistic, utilitarian and short-term. Therefore, the research output is relatively fast and abundant, but the influence of standardized citations in the discipline is not high.

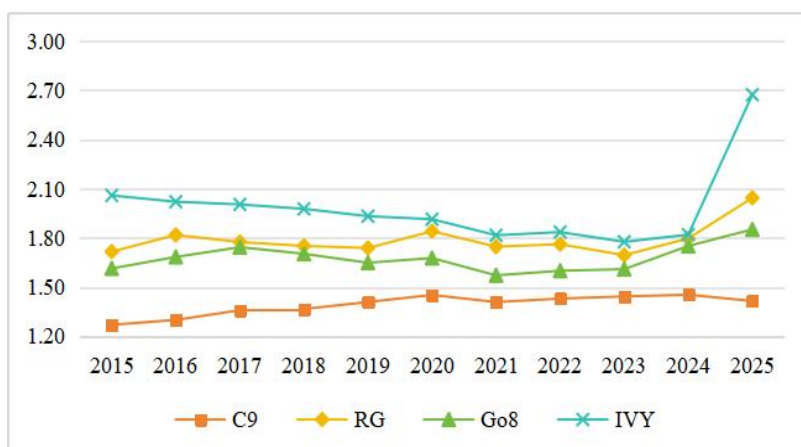


Figure 4. Comparison of the standardized citation influence of disciplines among the four university alliances from 2015 to 2025

From the indicator of influence relative to the global average level statistically shown in Figure 5, the global average influence of the Ivy League, the G8 University Alliance, and the Russell Group universities in the UK is all above 1.90. The global average influence of the C9 University

Alliance in China has generally shown an upward trend, but the influence value has been lower than 2.30 in most years. Its influence is relatively low compared to the global average. The main reasons for its low influence are as follows: The mainstream academic circles in Europe and America have long dominated the research hotspots and evaluation standards in this field. Chinese scholars often need to adapt to these external standards during the international publication process. However, there are often differences between such standards and the local practices and social demands in China, which limits the recognition and acceptance of scientific research achievements internationally and further affects the citation frequency of papers and the overall improvement of scientific research influence.

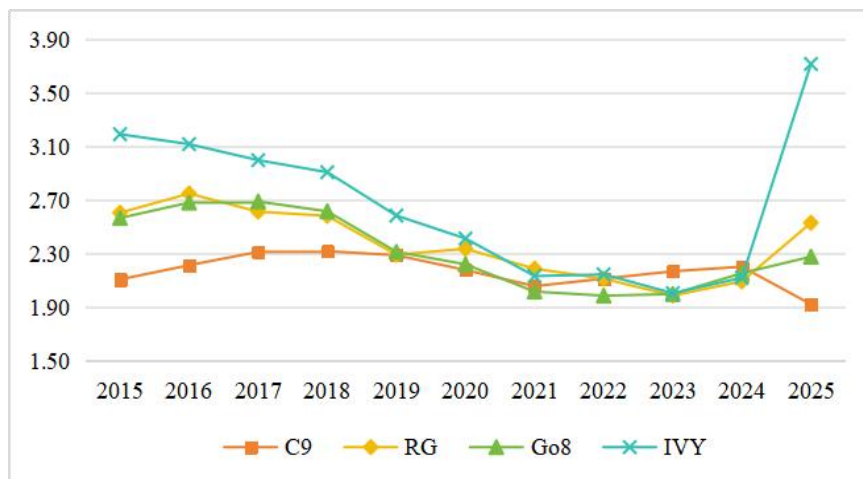


Figure 5. Comparison of the influence of the four university alliances relative to the global average from 2015 to 2025

4.3. Analysis of the Structure of the Discipline Group of the University Alliance

From the perspective of disciplinary structure, the disciplinary structures presented by the alliance of the four university alliances are significantly different. In this research, the number of papers and the total number of citations in a discipline area are in the high numerical range (that is, the number of papers is more than 5,000 and the total number of citations is more than 20,000). It is called a "dominant discipline", which represents the scale of scientific research output of the discipline has large academically influential and strong overall strength.

From the perspective of the overall disciplinary structure, the superior disciplinary structures of IVY, Go8, and RG university alliances are basically similar. Their advantage disciplines are clinical medicine and other biomedical related disciplinary fields. However, the disciplinary structure of C9 university alliance is different from the other three alliances. Traditional engineering disciplines such as science and engineering have advantages. The development level of emerging interdisciplinary fields such as biomedical related disciplines and space science is still far away from the world-class level. Social sciences, economic management and other disciplines are relatively backward.

In the IVY university alliance, there are 4 superior disciplines: Clinical medicine, Biology and biochemistry, Molecular biology and genetics, and Neuroscience and behavior. The C9 university alliance has 5 superior disciplines, namely: Materials Science, Clinical Medicine, Engineering, Physics and Chemistry. The main reason for the differences of China is that it has many research

institutions and researchers in these disciplines, because these ESI disciplines include many first-level disciplines which classified in China. Each English paper in ESI is classified in detail in the Web of Science database, including two classification methods, one is an internationally accepted discipline classification (SC field), the other is the Web of Science category (WC field). The Web of Science category is the paper category classification method developed by the Web of Science database company itself, which is more accurate and specific than the internationally accepted subject classification, including a total of 251 categories.

The Engineering discipline includes many first-level disciplines in China. With the help of the mapping relationship between the Web of Science classification provided by the Web of Science database and the Chinese Ministry of Education, the main supporting disciplines of Chinese engineering are analyzed in detail, and the major engineering disciplines in China are found. The supporting disciplines involve not only engineering, but also science and management. The main supporting disciplines include electronic science and technology, control science and engineering, computer science and technology, power engineering and engineering thermophysics, mechanical engineering, civil engineering, oil and natural gas engineering, materials science and engineering, etc.

Among Go8, RG, and IVY university alliances, clinical medicine is the most prominent. The academic influence of Chinese clinical medical research is still at a low level. On the one hand, the overall development level of Chinese medical research is still in a "tracking" state, and the original work or "spontaneous" research work is less or not mainstream. So there is still a significant gap in the number of hot papers compared with developed countries in Europe and America. On the other hand, the international influence of Chinese medical journals is still lacking. The number of Chinese medical journals indexed by SCI is far lower than that of the journal publishing powers such as the United States, the United Kingdom, and the Netherlands. At the same time, the sponsors of Chinese medical journals are still dominated by societies, associations, universities and hospitals. Due to the limited manpower and material resources, the influences of the journals are scattered. It is difficult to create a journal with general influence in a certain field.

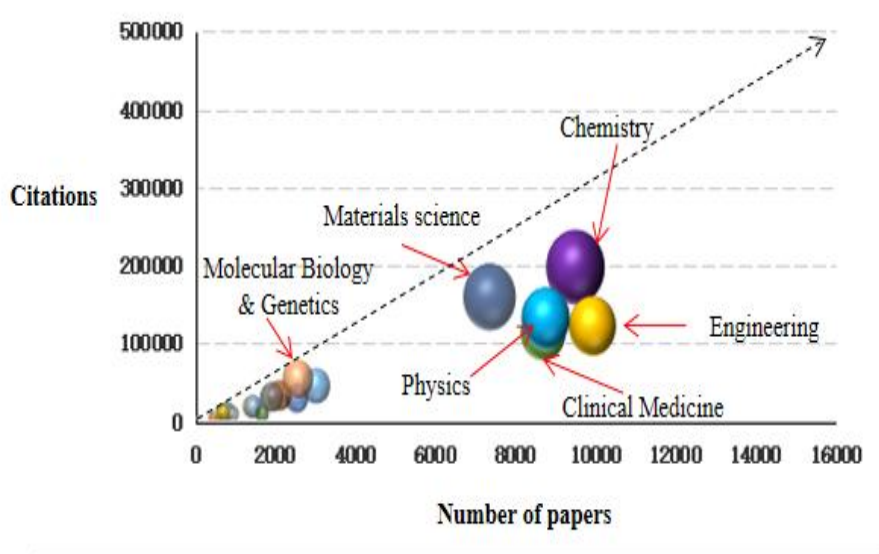


Figure 8. Structure of C9 University Alliance Discipline Group

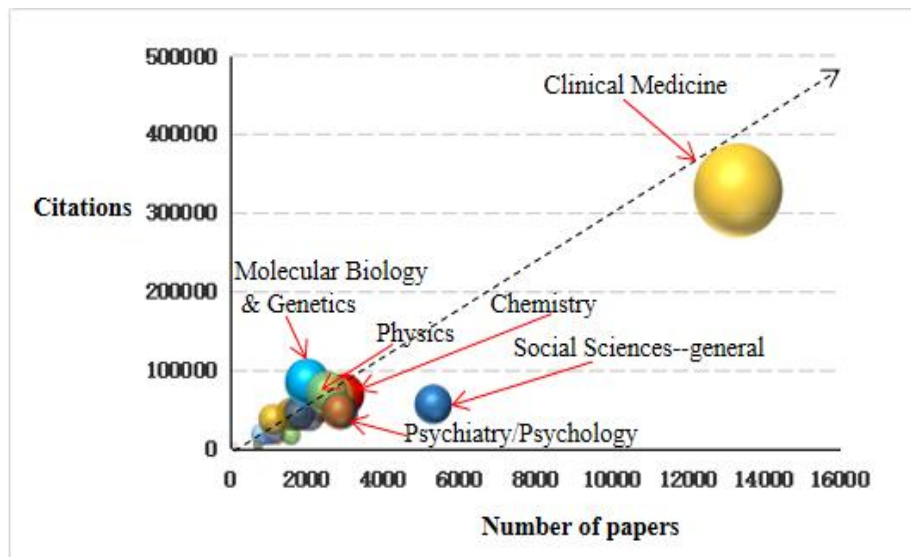


Figure 9. Structure of Go8 University Alliance Discipline Group

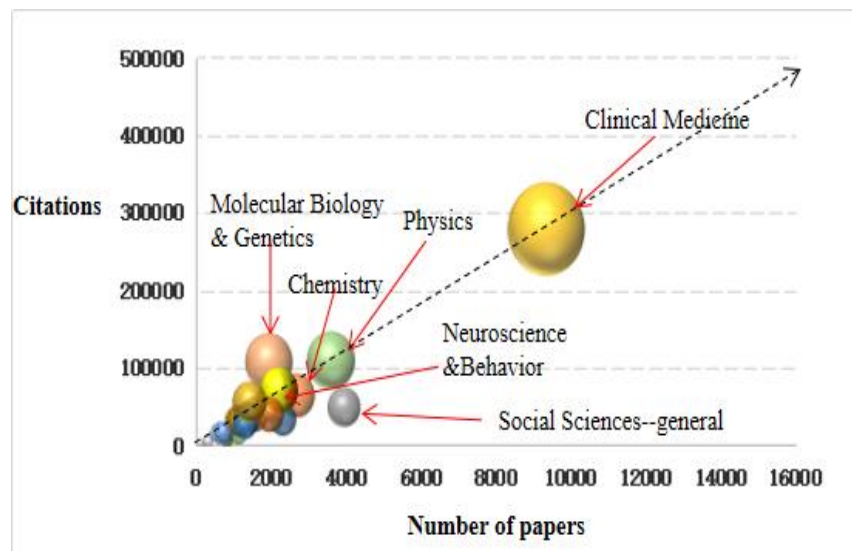


Figure 10. Structure of RG University Alliance Discipline Group

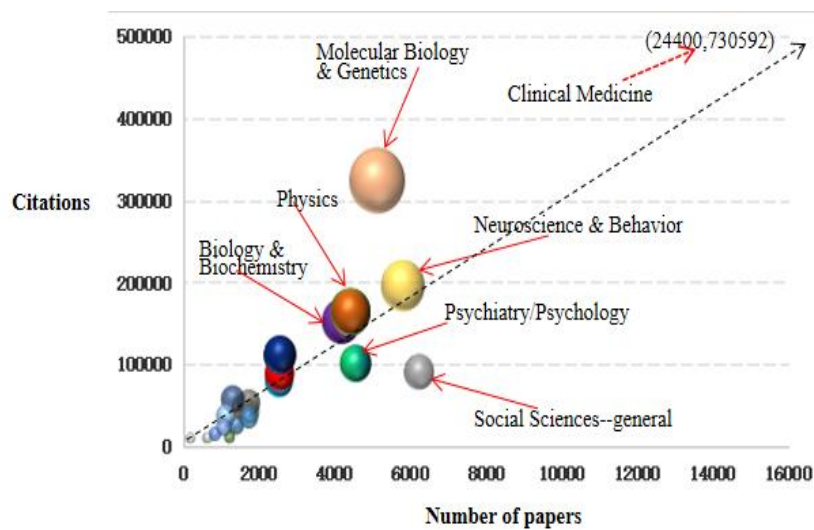


Figure 11. Structure of IVY University Alliance Discipline Group

Therefore, although the clinical medical research in china has developed rapidly, the scientific research results still lack of international influence, resulting in weak competitiveness. Based on the social needs, the accumulation and transferability of knowledge in medical disciplines is relatively high.

5. Conclusions

The research uses ESI and InCites databases to conduct research on the first-class disciplines of the four university alliances, which clearly shows the gap and characteristic advantages between the first-class disciplines of the four university alliances. Through the discussion of the number of scientific research output, scientific research influence, and discipline group structure, the results show that:

(1) The IVY university alliance is in a leading position in the number of first-class disciplines. The number of first-class disciplines in the C9 university alliance is relatively less.

(2) In terms of the scale of scientific research output, RG university alliance has more scientific research output, and C9 university alliance has a more significant growth rate in scientific research and development.

(3) In terms of scientific research influence, the RG university alliance has the highest percentage of international thesis cooperation, and the C9 university alliance has the lowest percentage. The scientific research influence of IVY university alliance is the most significant in terms of disciplinary citation influence and relative global average influence.

(4) In Figures 8-11, the four major university alliances have a large disciplinary group. The IVY, RG, and Go8 university alliances have the most obvious superior disciplines in clinical medicine, and the C9 university alliance has the most obvious superior disciplines in materials science.

Promoting national scientific and technological capabilities and strength obviously cannot rely on the strength of a certain field or university. It requires the construction and development of a number of first-class universities and disciplines. Evaluation and analysis from the perspective of the world's top university alliances can not only ensure that evaluation objects are as homogeneous as possible when comparing individuals, and avoid the impact of many external objective factors such as national and regional differentiation, also consider an international perspective ensuring the overall level and quality of the research objects. No matter how complete the disciplines of an university are, it is impossible to achieve a leading position in every discipline.

Although the development of university alliances is influenced by various countries and regions, politics, economy, and culture, the presentations of discipline development among university alliances are also quite different. However, in the process of globalization, maintaining close contact between scientific research and international frontiers, and further strengthening cooperation and exchanges with international research can continuously enhance the development and influence of the discipline. While paying attention to the frontier issues of discipline

development and understanding the international status of frontier cooperation are of great value for realizing the current status of the development of the discipline and the progress of research.

Author Contributions:

Conceptualization, M.L. and Y.L.; methodology, M.L. and B.D.; formal analysis, M.L.; investigation, M.L. and B.D.; data curation, M.L.; writing—original draft preparation, M.L.; writing—review and editing, B.D. and Y.L.; supervision, Y.L.; project administration, Y.L. All authors have read and agreed to the published version of the manuscript.

Funding:

This research was funded by the Humanities and Social Sciences Youth Fund Project of the Ministry of Education of China “Research on System Optimization and Implementation Path of Digital Technology Empowering University Research Evaluation Reform” grant number 24YJCZH176. “The Growth Law and Early Identification of High level Innovative Talents in Basic Research” grant number 24YJCZH417; and the General Project of Liaoning Provincial Economic and Social Development Research “Research on the Optimization of Interdisciplinary Evaluation Mechanism and Construction Path in Liaoning Province’s Universities” grant number 2025lslybkt-044.

Institutional Review Board Statement:

Not applicable.

Informed Consent Statement:

Not applicable.

Data Availability Statement:

Not applicable.

Conflict of Interest:

The authors declare no conflict of interest.

References

- Biermann, R. (2008). Towards a theory of inter-organizational networking: The Euro-Atlantic security institutions interacting. *The Review of International Organizations*, 3(2), 151–177.
- Buckley, P. J., & Casson, M. (1996). An economic model of international joint venture strategy. *Journal of International Business Studies*, 27(5), 849–876.
- Cantor, D. E., Bolumole, Y. A., Coleman, B. J., & Frankel, R. (2010). An examination of trends and impact of authorship collaboration in logistics research. *Journal of Business Logistics*, 31(1), 197–215.
- Dahlin, B., Levin, E., & White, P. E. (1963). 2S31. Exchange as a conceptual framework for the study of interorganizational relationships. *Nursing Research*, 12(4), 264.

- DiMaggio, P. J., & Powell, W. W. (1983). The iron cage revisited: Institutional isomorphism and collective rationality in organizational fields. *American Sociological Review*, 48(2), 147–160.
- Fedor, K. J., & Werther, W. B., Jr. (1995). Making sense of cultural factors in international alliances. *Organizational Dynamics*, 23(4), 33–48.
- Gunn, A., & Mintrom, M. (2013). Global university alliances and the creation of collaborative advantage. *Journal of Higher Education Policy and Management*, 35(2), 179–192.
- Igami, M., & Saka, A. (2007). Capturing the evolving nature of science, the development of new scientific indicators and the mapping of science (OECD Science, Technology and Industry Working Papers No. 2007/01). OECD Publishing. <https://doi.org/10.1787/300005636714>
- Inkpen, A. C. (2000). Learning through joint ventures: A framework of knowledge acquisition. *Journal of Management Studies*, 37(7), 1019–1044.
- Kale, P., Dyer, J. H., & Singh, H. (2002). Alliance capability, stock market response, and long-term alliance success: The role of the alliance function. *Strategic Management Journal*, 23(8), 747–767.
- Klein, D. B., & Chiang, E. (2004). The Social Science Citation Index: A black box—with an ideological bias? *Econ Journal Watch*, 1(1), 134–165.
- Knight, J., & de Wit, H. (1995). Strategies for internationalisation of higher education: Historical and conceptual perspectives. In H. de Wit (Ed.), *Strategies for the internationalisation of higher education: A comparative study of Australia, Canada, Europe and the United States of America* (pp. 5–32). European Association for International Education.
- Leonard-Barton, D. (1992). Core capabilities and core rigidities: A paradox in managing new product development. *Strategic Management Journal*, 13(S1), 111–125.
- Mukherjee, B. (2011). Evaluation of Indian research performance in the emerging fields of environmental sciences. *COLLNET Journal of Scientometrics and Information Management*, 5(1), 81–98.
- Prahalad, C. K., & Hamel, G. (1990). The core competence of the corporation. *Harvard Business Review*, 68(3), 79–91. <https://hbr.org/1990/05/the-core-competence-of-the-corporation>
- Price, D. J. de S. (1965). Networks of scientific papers. *Science*, 149(3683), 510–515.
- Saffu, K. S., & Mamman, A. (1999). Mechanics, problems and contributions of tertiary strategic alliances: The case of 22 Australian universities. *International Journal of Educational Management*, 13(6), 281–286.
- Starodubov, V. I., Kurakova, N. G., Tsvetkova, L. A., Aref'ev, P. G., & Kurakov, A. F. (2012). The problems associated with the evaluation of world-class competitiveness of Russia's science, as illustrated by clinical medicine. *Scientific and Technical Information Processing*, 39(3), 139–152.
- Sun, W., Wu, L., & Hao, X. (2016). Agricultural research front detection and national cooperative performance analysis based on ESI. In *2016 3rd International Conference on Systems and Informatics (ICSAI)* (pp. 1095–1100). IEEE.
- Teichler, U. (2009). Internationalisation of higher education: European experiences. *Asia Pacific Education Review*, 10(1), 93–106.

United Nations Educational, Scientific and Cultural Organization. (2005). United Nations Decade of Education for Sustainable Development (2005–2014): International implementation scheme (ED/DESD/2005/PI/01). <https://unesdoc.unesco.org/ark:/48223/pf0000148654>

Wacquant, L. J. D. (1989). Towards a reflexive sociology: A workshop with Pierre Bourdieu. *Sociological Theory*, 7(1), 26–63.

License: Copyright (c) 2026 Author.

All articles published in this journal are licensed under the Creative Commons Attribution 4.0 International License (CC BY 4.0). This license permits unrestricted use, distribution, and reproduction in any medium, provided the original author(s) and source are properly credited. Authors retain copyright of their work, and readers are free to copy, share, adapt, and build upon the material for any purpose, including commercial use, as long as appropriate attribution is given.