



How to Build Grassroots Academic Organization Better in China University under the Background of Big Data

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Abstract. Teachers are an important part of higher education, and the construction of grassroots academic organizations is of great significance to promote the improvement of teaching quality and academic research level in universities. Grassroots academic organization of university is an important channel for teachers to conduct academic exchanges, learn from each other and improve the quality of teaching. For teachers, participating in academic organizations can obtain rich academic resources and human resources to improve their academic level and career development ability; for the university, building a good grassroots academic organization can promote the prosperity of academic culture and enhance the overall strength and competitiveness of the university. In order to lay a better foundation for university teaching and scientific research, there is a need to improve the study of grassroots academic organizations. This paper will elaborate and discuss what is the grassroots academic organization, why build the grassroots academic organization, the main contents and methods of the grassroots academic organization construction, and the problems that need to be paid attention to in the construction. What's more, under the background of big data, how to make better use of the big data platform to do a good job in the construction of grassroots academic organizations in China universities.

Keywords: Grassroots academic organization; China university; Background of big data

1 Introduction

Grassroots academic organizations of universities are grassroots organizations that undertake scientific research and teaching tasks, carry out teaching reform and innovation, are directly responsible for scientific research and teaching quality, and daily management of students^[21]. Grassroots academic organizations established by university teachers in their own colleges, departments, teaching and research departments, according to certain management systems and organizational forms, to promote academic exchanges, improve their teaching level and research ability. Grassroots academic organizations are the important places for university teachers to carry out academic research, teaching reform, curriculum construction and teaching evaluation

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activities. Through academic exchanges and discussions, teachers can learn from others' experience, improve their teaching ability and research level, and at the same time can share their experiences and achievements with others to promote common academic progress. At present, with the increasing number of teachers in universities, the scale and number of academic organizations are also gradually expanding. In addition to the traditional discipline academic organizations, some new academic organizations have also emerged, such as interdisciplinary and comprehensive academic organizations. The content of academic research is richer and more diverse. With the continuous improvement of China's higher education and scientific research level, the academic research content of grassroots academic organizations of university teachers is also more rich and diversified, covering a wider range and covering more disciplines. More attention is paid to the transformation and application of research results. Grassroots academic organizations of university not only pay attention to the pure theoretical level of academic research, but also pay attention to the transformation and application of research achievements, and actively promote the transformation and application of academic achievements to the society. Grassroots academic organizations of university pay attention to guiding and training young teachers to participate in academic research and exchanges, providing them with a platform for academic exchanges, and improving their academic level and innovation ability. However, there are many problems in the grassroots academic organization of university teachers. There are a large number of academic organizations, but the participation is not high, and many teachers are unwilling or unable to actively participate. This problem may be related to factors such as heavy workload and tight time arrangement; academic organization management, lack of effective management and supervision mechanism, resulting in uneven quality and effect of organizational activities, which also limits the development and growth of the organization. In addition, the lack of financial support for academic organizations to conduct more diversified and rich academic activities, posing certain challenges to the long-term development of the organization. Moreover, in the background of big data, the form of grassroots academic organizations in universities is more severe. Therefore, under the condition of the rapid development of knowledge economy, network information technology and artificial functions, it is of great significance to discuss how to do a good job in the construction of grassroots academic organizations.

With the rapid development and popularization of big data technology, higher education is constantly facing new challenges and opportunities, and the ways or methods of higher education organization management have also changed^[10]. Big data is typically described as having a high volume, velocity, and variety in the digital age, although there is no single unified definition^[20]. The amount of data in our world has been exploding^[15]. Academic organizations need to integrate all kinds of information and data to conduct in-depth analysis and mining to achieve more efficient management and decision-making. Data-based operations enable academic organizations understand their operating conditions more accurately, find problems and make adjustments timely to achieve better operational results. The management of academic organizations mainly depends on experience and intuition, so it is inevitable that there are certain blind spots and deficiencies. With the application of big data technology, aca-

ademic organizations can use data analysis tools and algorithms to conduct in-depth analysis and mining of various data, and draw more scientific and accurate management conclusions, so as to achieve more efficient management and decision-making. In the context of big data, another feature of academic organization management is collaboration. Academic organizations need to strengthen data sharing and collaboration among various departments and personnel to achieve more efficient workflows and decision-making mechanisms^[6]. Collaboration can effectively promote the innovation and development of academic organizations, and improve the work efficiency and level. Academic organizations can open their own data and research results to other academic organizations and researchers to promote the exchange and cooperation of academic research. Open sharing can promote collaboration and innovation among academic organizations, and promote the development and progress of academic research. Academic organizations can use data analysis and mining tools to draw more scientific and accurate decision conclusions, so as to achieve more efficient decision-making and management. Intelligent decision-making can improve the operation of academic organizations.

2 History of the development of grassroots academic organizations

2.1 Development history of grassroots academic organizations in the World

In the second half of the 16th century, when Melville was president of the University of Glasgow in Scotland, he adopted the single-subject professorship instead of traditional teachers, having a great impact on the development of knowledge^[3]. In the 19th century, academic associations began to rise in European academic circles. For example, the German Association for Scientific Research (Kaiser Wilhelm Society) was founded in 1911 to promote scientific research and academic exchanges^[9]. In the first half of the 19th century, the teaching and research group appeared in Russia."The teaching and research section is the basic unit of teaching and scientific research in institutions of higher learning, conducting teaching, method research and scientific research in one to several subjects"^[14]. At the beginning of the 20th century, discipline associations and societies began to appear in American academia. For example, the American Psychological Association (APA) was founded in 1892 to promote psychological research and education, and to promote the application of psychology in society^[11]. In the 1950s, discipline associations and societies began to appear in British academia. For example, the Royal Society, founded in 1660, is one of the oldest and most prestigious academic organizations in the UK, aiming to promote the development and progress of the natural sciences^[18], which has been active in the UK for many decades and continue to play a vital role in advancing knowledge in their respective fields. In the 1960s, small groups and academic committees within disciplines began to appear within American universities to promote academic exchanges and cooperation among university teachers. Under this influence, some universities gradually carry out "interdisciplinary education and research programs", such as Stanford University^[22]. In the

21st century, with the development of information technology, academic organizations are increasingly inclined to online communication and cooperation. For example, the academic social networks ResearchGate and Academia.edu, and others have become important platforms for teachers' academic exchanges. The development of grassroots academic organizations of university attaches more and more importance to interdisciplinary cooperation and diversification around the world. For example, many universities have established interdisciplinary research centers, joint research programs, and collaborative projects to promote communication and cooperation between different disciplines^[12,16]. In addition, some universities are committed to promoting diversity and encouraging teachers from different backgrounds to participate in academic organizations in order to achieve broader academic exchanges and cooperation.

2.2 Development history of grassroots academic organizations in China

In 1902, China established the China Education Association, which was committed to promoting education reform and research. Since then, a series of academic organizations have been established, such as the Chinese Studies Association, the Chinese Culture Research Society, the Historical Society and so on. These organizations have all played an active role in promoting academic research, discipline building, and personnel training. In 1929, the National Government promulgated the "University Organic Law", which stipulated that "universities are divided into colleges of liberal arts, science, law, education, agriculture, industry, business, and medicine. Only those with three or more colleges are called universities". "Every colleges of university has several departments, and attached specialized subjects"^[13]. In the early days of the founding of new China, in order to promote the development of education, the state attached great importance to and supported the construction and development of university teacher organizations. "The Interim Regulations for Institutions of Higher Learning" promulgated by the Ministry of Education in 1950 stipulates that "Universities and specialized colleges have several departments, whose establishment or change shall be decided by the Ministry of Education of the CPC Central Committee"^[5]. In 1951, the National Association of Teachers of Higher Learning was established, which marked that Chinese university teachers' academic organizations had entered a new stage of development. In 1963, "the Decision on Strengthening the Unified Leadership and hierarchical Management of Institutions of Higher Learning (Trial Draft)" was issued, which clarified the relevant requirements on the internal management system of universities. In this stage, Chinese universities have formed the academic structure of school (college)-department-teaching and research section. With the expansion of universities, the improvement of personnel training level, scientific research and social service function, school-college-department (center) become university academic architecture in the face of globalization and the knowledge economy era, academic organization constantly adjust and improve their working style and content, participate in international academic exchanges and cooperation, promote the transformation of academic innovation and scientific research achievements actively. At the same time, university teachers organizations also play their

own role in promoting the reform and development of higher education and academic undertakings actively.

2.3 The current organizational form of grassroots academic organizations in Chinese universities

2.3.1 Macro-organization form

At present, the organizational structure of Chinese universities basically includes vertical power structure and horizontal professional structure. John van derGraf put forward six organizational level classifications of higher education, and advocated the use of a basic concept when analyzing the organizational structure of all levels of higher education, that is, the hierarchy of structure. The reality shows that in the dictatorship structure, power is concentrated at the top of the structure, while in the academic structure, power is evenly distributed in different units at a certain level. "The six levels of order are departments or lectures, departments (according to European usage, referring to professional training or a group of disciplines), universities, joint universities, state and central governments. The traditional university includes the first three levels, and the last three levels are above it"^[19]. From the perspective of horizontal structure, the grassroots academic organizations of universities have management functions, which mainly perform the management responsibilities of teaching and scientific research of universities. The heads of these organizations are usually held by professors or teachers.

2.3.2 The micro-organization form

The micro-organization form includes the academic leader system and the discipline or professional research team system. Academic leaders refers to those who have profound attainments and senior titles in a certain discipline, can judge the development direction of this field correctly, put forward and select corresponding new tasks and topics for teaching and scientific research timely, and guide or organize teachers and scientific researchers to carry out their work to achieve important results. Its main responsibilities include: serving as the leader of academic collectives and the supervisor of scientific research projects, submitting research results reports or papers every year, submitting academic dynamic reports within the scope of the discipline timely, organizing and participating in academic exchanges at home and abroad^[8]. At the same time, in order to ensure the sustainable development of teaching and scientific research in universities, it is necessary to establish a long-term operation mechanism, and the core is to cultivate a group of teaching and research talents of different ages. A research team is a team formed based on a temporary project or research task^[21].

3 The construction of grassroots academic organizations is of great significance

3.1 Promote academic exchanges and cooperation

First of all, grassroots academic organizations can provide a platform for university teachers to communicate. Teachers can exchange their research results, share their research experience, discuss the problems and difficulties in the research, and discuss the solutions together. This communication can not only help teachers to keep abreast of the latest research progress of their peers, but also stimulate teachers' research enthusiasm and promote their academic growth. Secondly, grassroots academic organizations can also provide a cooperative platform for university teachers. Through cooperation, they can make full use of their respective expertise and strengths to form a synergy to complete some large or complex research projects. Grassroots academic organizations can provide opportunities for teachers to cooperate and participate in some research projects and complete some research results together. This can not only improve the academic level of teachers, but also promote the connection and interaction between them, and further enhance the academic atmosphere. In addition, grassroots academic organizations can also provide a platform for teachers to learn from the experience of others. In academic research, it is very common to learn from the experiences and results of others. Grassroots academic organizations can provide an opportunity for teachers to understand and learn from the research results and experience of their peers, learn from their advantages and experience, and improve their research level. Finally, grassroots academic organizations can also provide a platform for university teachers to solve their teaching and research problems together. In teaching and scientific research, difficult problems and problems will always exist. Grassroots academic organizations can provide a platform for teachers to discuss and solve these problems together. Through the interaction and discussion between teachers, better solutions can be found to improve the teaching and research results.

3.2 Improve the teaching quality.

First of all, improve the teaching quality through teaching observation. Teaching observation can allow teachers to experience the teaching methods personally, learn from and absorb the teaching experience of other teachers, so as to improve their own teaching strategies and teaching methods constantly. In addition, by observing other teachers' classes, it can also help teachers to better understand the actual situation and needs of students, and make teaching plans and teaching contents more accurately. Secondly, to improve the quality of teaching through lectures. Academic organizations can invite some experts with high visibility and professional ability in the field of education to give lectures, to provide teachers with the latest educational ideas and technologies, so that teachers can grasp the latest teaching methods and educational policies timely, and improve the quality and level of teaching. Thirdly, improve the quality of teaching through seminars. In the seminar, teachers can have in-depth discussions and exchanges on a certain teaching difficulties or teaching problems, and find

the best teaching strategies and teaching methods with the help of collective wisdom and cooperation. The seminar can also help teachers understand the latest progress and achievements in other disciplines and fields, thus broadening their knowledge and improving the level of teaching. In addition, academic organizations can also set up a number of courses to improve teaching ability, design and offer courses at different levels according to teachers' different teaching needs and ability levels, to help teachers improve the level of education and teaching comprehensively.

3.3 Improve the level of scientific research.

Grassroots academic organizations can promote cooperative research among teachers and improve the quality and effectiveness of research. Collaborative research can enable the full integration of expertise between different disciplines to support interdisciplinary research and development in education. At the same time, cooperative research can also help teachers to make better use of their respective advantages, improve the efficiency and output of research, and make greater contributions to the development of education. Grassroots academic organizations can promote teachers to have a deeper understanding of the significance and value of scientific research, so as to stimulate their enthusiasm and creativity for scientific research. In addition, academic organizations can provide teachers with certain awards and honors for their outstanding contributions to scientific research, improve their reputation and influence, and bring great help to their career development in academia and education. In addition, grassroots academic organizations can also provide scientific research resources and support for teachers. For example, they can provide laboratories, equipment, data and other research resources to help teachers carry out their research work smoothly. At the same time, academic organizations can also provide teachers with support in scientific research project application and fund application, so as to provide necessary guarantee and support for their scientific research work.

4 The possible problems in the construction of grassroots academic organizations in universities

4.1 More academic organizations, but not high participation.

On the one hand, some teachers may feel that their research topics do not match the topics of academic organizations, or think that their research is very mature and do not need to participate in these organizations. On the other hand, some teachers may feel that it takes a lot of time and effort to participate in academic organizations, and that the results may not be significantly rewarded, so they are reluctant to participate. Secondly, it can be analyzed from the perspective of the academic organization itself. On the one hand, some academic organizations may lack attractive activities and content, resulting in teachers without the motivation to participate. On the other hand, the organizational structure and management mode of some academic organizations may not be flexible

and effective enough, making teachers feel confused about the participation of these organizations.

4.2 Disorderly academic organization and management.

First of all, the fixed position of long-term academic leaders may lead to the lack of new blood and new ideas in the organization and let the organizational management easy to become rigid. These established members have formed their own thinking set and management style, and they may hinder the entry of new people, making it difficult for innovation and change within the organization. This also let the organizational concept and ability of organizational managers can not be effectively improved and updated, thus leading to the loss of flexibility and adaptability of organizational management. Secondly, the academic organizations are usually organized spontaneously and lack the institutionalized management of the organizations. Due to the lack of effective management and supervision mechanism, some organizations have chaotic management, and there may be some non-standard behaviors, such as private use of public funds, power rent-seeking and other problems. In this case, if there is no corresponding laws and regulations to regulate the behavior of academic organizations, it may have a negative impact on the reputation and social responsibility of the organization, and then affect the development and long-term planning of the organization.

4.3 Academic organizations have a certain tendency of elitism.

Academic organizations need to invest a lot of manpower, material resources and financial resources to maintain the normal operation of the organization, and these resources need to be effectively managed and allocated to ensure the stable operation of the organization. However, due to limited resources, academic organizations often can only recruit a certain number of members, which causes organizations to pay more attention to their academic level and research contribution when selecting members. Therefore, academic organizations tend to be more inclined to recruit teachers and researchers who already have achieved considerable academic achievements, thus forming a certain tendency of elitism. Moreover, academic organizations are usually composed of a group of scholars with high academic attainments in a specific field, who often have similar research interests and goals. This shared academic interest and goal allows members of academic organizations to be more linked closely and to explore and study academic issues within a field together. However, due to the particularity of the research direction and objectives, academic organizations often need to choose those scholars with considerable research experience and achievements in the field to join the organization, so as to ensure the academic quality and research effectiveness of the organization. Therefore, as a result, academic organizations are more inclined to recruit teachers and researchers who have already achieved considerable academic achievements.

4.4 Lack of sustainable funding support for academic organizations.

Academic organizations need a certain amount of money to carry out various activities, such as academic seminars, forums, research projects, and so on. Without funding, academic organizations will be unable to conduct these activities and will be limited in scale. This will lead to a weaker influence of academic organizations, difficult to attract more members and scholars, and may even face the risk of dissolution. Second, the lack of funding will affect the research results of academic organizations. The research results of academic organizations are one of the important indicators to evaluate the level of the organization, and the lack of financial support will limit the research ability and level of the organization. For example, the lack of financial support may prevent the organization to conduct large investigative research projects, limiting the scope and depth of research in the organization. In addition, the lack of financial support can also affect the publishing activities of the organization, being unable to publish high-level academic journals and publications, further affecting the academic reputation and influence of the academic organization. Third, the lack of financial support will affect the talent training of academic organizations. Academic organizations need a certain amount of funds to provide various academic exchanges and training opportunities, and to provide a platform for academic exchanges and academic improvement. However, the lack of financial support will affect the training ability of academic organizations, and cannot provide sufficient training and support for academic talents, which will lead to the lack of talent reserve of academic organizations, and it is difficult to provide high-level talents for the academic community.

4.5 The academic level of academic organizations is uneven.

Due to the different composition of academic organizations, the academic levels are uneven. Some academic organizations have high academic level, while some academic organizations have low academic level. If the members of the organization are famous experts or outstanding scholars in the field, then the academic level of the organization will naturally be high, and if the members of the organization have many lower academic level, the academic level of the organization will be low. Moreover, some academic organizations focus on a specific field of research, such as chemistry, physics, etc., while others focus on interdisciplinary research, such as environmental science, systems science, etc. Due to the different research objects and methods in different fields, the academic level of each academic organization will also vary.

5 The new situation faced by the grassroots academic organizations under the background of big data

In the context of big data, data processing is more digital^[7]. Grassroots academic organizations in universities promote academic exchanges and cooperation by establishing academic exchange platforms and promoting data sharing, so as to expand their academic influence and service scope. In terms of the construction of academic ex-

change platforms, some grassroots academic organizations in universities have established their own academic websites, Blogs, WeChat and other platforms to release academic information, paper collection, academic activity information, etc. These platforms not only provide places for scholars to communicate, but also provide opportunities for academic organizations to show their own characteristics and attract more attention. In addition, promoting data sharing is also one of the most important ways to promote academic exchanges and cooperation. Grassroots academic organizations in colleges and universities can establish their own academic data sharing platform to share academic achievements, data sets, laboratory equipment and other resources, which is not only conducive to optimizing resource allocation, but also conducive to promoting the progress and cooperation of academic research.

Data mining technology can help academic organizations extract valuable information from massive academic data and provide personalized academic services for teachers. For example, A broad range of data mining techniques can be utilized for big data in education^[2]. Data mining technology can help teachers to better carry out academic research by analyzing their academic papers, research fields and published journals, and recommending relevant academic papers and academic resources for teachers. In addition, data mining technology can also analyze teachers' academic achievements and help academic organizations understand teachers' academic level and research direction. For example, academic organizations can use data mining technology to analyze teachers' academic papers, understand teachers' research field, research direction, published journals and other information, so as to provide teachers with more accurate academic services. In addition, academic organizations can also use data mining technology to analyze academic journals, understand the influence factors of journals, review cycle and other information, so as to provide a basis for teachers to choose appropriate journals. Academic resource integration is also an important service in data-driven academic services. The integration of academic resources can help academic organizations to better integrate and manage academic resources, and provide comprehensive and convenient academic services for teachers. For example, academic organizations can integrate the academic resources needed by teachers together through the integration of academic resources, such as academic databases, literature retrieval tools, translation tools, etc., which are convenient for teachers to use. In addition, academic organizations can also use the integrated academic resources to integrate and manage academic courses and academic lectures, etc., to provide more comprehensive academic services for teachers.

Teacher evaluation based on data analysis is an important part of data-based academic evaluation and management^[11,17]. By collecting teachers' academic achievements, teaching quality, social services and other information, and using data mining technology to evaluate teachers, teachers' academic level and comprehensive ability can be evaluated objectively. For example, academic organizations can evaluate teachers' number of papers, published journals, as well as teaching quality and teaching evaluation through data analysis, so as to conduct a comprehensive and objective evaluation for teachers. In addition, subject evaluation based on data analysis is also one of the important contents of data-based academic evaluation and management. Subject evaluation is an important work of academic management in colleges and

universities. It evaluates the development status, discipline direction and discipline level, which is an important basis for academic organizations to formulate discipline construction plans and improve discipline construction. By collecting the academic achievements, personnel training, scientific research projects, scientific and technological achievements of the discipline, and using big data technology to evaluate the discipline, the development and level of the discipline can be evaluated objectively. In the digital academic evaluation and management, data security is also an important issue. Academic organizations need to establish a sound data security guarantee system to ensure the security and confidentiality of academic data^[4]. For example, academic organizations can use cryptography, data encryption and other technologies to encrypt and protect academic data to avoid data leakage and improper use. In addition, academic organizations also need to strengthen the regulation and supervision of data use, establish standards and procedures for data use, and ensure the legal use and security of data.

Grassroots academic organizations of universities also use big data technology for academic promotion and communication, such as academic publicity and academic information push based on social media, to improve the efficiency and scope of academic communication and expand their academic influence.

6 Improvement measures for the construction of grassroots academic organizations in universities

The grassroots academic organizations play an important role in promoting teacher academic exchanges and improving teaching quality. However, the problems existing in the current academic organizations cannot be ignored. By strengthening organizational management, encouraging teachers' participation, promoting organizational opening and democratization, and strengthening financial support, the efficiency and influence of academic organizations can be further improved, the prosperity and development of academic culture can be promoted, and the overall strength and competitiveness of universities can be improved.

Firstly, strengthen the organizational management of academic organizations. The management mechanism of the academic organization should be established and improved, the objectives and responsibilities of the academic organization should be defined, the head and management team of the academic organization should be established, and the supervision and management of the organization should be strengthened to ensure the effective operation of the academic organization.

Secondly, improve the quality and efficiency of academic organizations. By increasing the activities of academic organizations, diversified and professional academic exchange activities can be carried out to enrich teachers' academic life and improve the attraction and influence of academic organizations. At the same time, it can strengthen the academic evaluation and communication within the organization, and improve the academic level and quality within the organization.

Thirdly, encourage more teachers to participate in academic organizations. More teachers can be attracted to participate by holding internal activities, such as academic

seminars, experience sharing, teaching and observation, etc. At the same time, teachers can also be encouraged to participate in academic organizations by providing incentives and incentives.

Fourthly, promote the openness and democratization of academic organizations. Academic organizations should be open and democratized, so that more teachers can participate in their decision-making and management. The membership system of academic organizations should be established, and the leaders and management team of academic organizations should be elected by the member congress, so as to promote the openness and democratization of academic organizations and allow more teachers to participate in the construction and management of academic organizations.

Fifthly, strengthen the financial support of academic organizations. Academic organizations need financial support to carry out more diverse and rich academic activities. The university should increase the financial support for academic organizations. At the same time, academic organizations can also raise funds for activities by applying for social donations and sponsorship, so as to improve the self-development ability of academic organizations.

7 Conclusion

In the era of big data, the construction of grassroots academic organizations is of great significance in improving the quality of university teaching and academic research. Through participation in grassroots academic organizations, teachers can gain access to abundant academic resources and support, enhancing their own academic level and professional development capabilities. Additionally, the construction of grassroots academic organizations can also promote the flourishing of academic culture and enhance the overall strength and competitiveness of universities. In the context of big data, the utilization of big data platforms can facilitate the collection, analysis, and management of academic resources, providing more scientific and accurate decision-making and planning support for grassroots academic organizations. However, during the construction process, attention should be given to the clarification of positioning and objectives, the establishment of sound organizational structure and management mechanisms, the active promotion of academic exchange and collaboration, as well as the effective establishment of evaluation and incentive mechanisms. By fully utilizing big data platforms, we can further enhance the effectiveness of grassroots academic organizations and drive the development of university teaching and academic research.

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