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Experience and Enlightenment of Using Big Data for Scientific Research at Universities in Developed Countries

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ABSTRACT. *With the continuous improvement of global information technology, the era of big data is coming. Network technology has penetrated into all areas of social development, and has also brought unprecedented challenges and opportunities to university research. Governments around the world attach great importance to the application and development of big data technology; and universities are also researching and exploring the application of big data technology in the field of scientific research. At present, many universities in developed countries have established a relatively complete application system of big data, and adopted a series of methods and ways to promote the use of big data in the field of scientific research in colleges and universities, forming a lot of valuable experience, which has brought enlightenment to the research and utilization of big data in other countries.*

KEYWORDS: *Universities; Scientific research; Big data*

1. Introduction

In recent years, the popularity and application of Internet technology have been continuously expanded, reaching into all aspects of social and economic life. With the continuous expansion of network storage data scale and continuous increase in transmission speed, as well as the continuous innovation of data storage and output forms, a huge data torrent has formed, which also means that the era of big data has arrived. Countries around the world attach great importance to the application of big data, and actively carry out the development and utilization of big data technologies. Colleges and universities have also dug into the role of big data in scientific research in order to create more modern, informational, scientific, and large-scale applications. The scientific research data system promotes the continuous improvement of scientific research. [1]

2. The Necessity of Using Big Data for Scientific Research in Universities

The use of big data for social construction has become a global trend. Colleges and universities shoulder the functions of training talents, developing science and technology, and serving the society. Harvard University in the United States has proposed to train national leaders; and MIT has proposed to train engineers with a global economic background. This shows that universities are the cradle of talent. The cultivation of talents in Colleges and universities is inseparable from the development of scientific research work in Colleges and universities, and the improvement of scientific research management system in Colleges and universities plays a positive role in promoting the function of colleges and universities.

The emergence of big data technology has brought new methods and new approaches for scientific research in colleges and universities. It has provided new ideas in scientific research topic selection, avoiding research duplication, scientific research data sharing, scientific research achievements transformation and so on, which has strong positive significance. However, compared with other fields, the foundation of scientific research management by using big data

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technology in Colleges and universities all over the world is still relatively weak, which is still under exploration. It is necessary to further explore the potential value of big data technology and study how to make full and scientific use of big data technology to promote the innovation and development of scientific research. Big data technology promotes the innovative development of scientific research. Therefore, it is necessary to use big data for scientific research in universities.

3. The Current Status of Scientific Research and Utilization of Big Data at Universities in Developed Countries

The research on big data in developed countries started earlier. At the beginning of the 20th century, *Nature* and *Science* magazines launched the big data special issue, and some American scholars jointly published the white paper *Challenges and Opportunities of Big Data*. Scholars generally believe that big data has brought about the change of scientific paradigm; and human beings have ushered in the data exploration paradigm in the era of big data. By analyzing the application cases of data technology in various fields of society, Viktor Mayer Schonberger, a data research expert, believes that big data has brought great impact on people's work, life, social interaction and thinking mode, and that the era of big data is inevitable.[2]

In the field of scientific research, universities in developed countries also started early, and many universities have established relevant data management models by big data technology. For example, the EDINA National Academic Data Center established at the University of Edinburgh in the United Kingdom is jointly constructed by Oxford University and Southampton University. The center mainly uses big data technology to explore new models and new methods for scientific research data sharing in colleges and universities. Another example is the Los Alamos National Laboratory Research Library in the United States, which uses the Assessing Institutional Digital Assets (AIDA) project to conduct self-assessments to improve the data system.

4. The Experience and Inspiration of Scientific Research and Utilization of Big Data in Universities of Developed Countries

4.1 The Experience of Using Big Data for Scientific Research in Universities of Developed Countries

Colleges and universities in developed countries have a lot of innovations in scientific research. They have adopted a variety of approaches, relying on big data technology to modernize and scientifically manage scientific research, and have achieved certain results and experience.

(1) To Deepen the Concept of Big Data

Establishing and deepening the concept of big data is the key and foundation for implementing big data technology in the scientific research field. Seven chapters of the UK Research Council require universities to improve their data management plans when applying for project funding. It can be seen that the United Kingdom attaches great importance to the promotion of big data technology in the scientific research field, and has also put forward requirements on the application of big data in British universities. Universities such as the University of Edinburgh and the University of Bath are actively developing data management routes and measures, which are closely related to the big data policy implemented in the UK. The implementation of these policies are also inseparable from the advanced nature of British big data technology infrastructure and management.[3] The scientific research of developed countries attaches great importance to the concept of big data, investing financial resources and energy, and widely promoting and implementing it in the form of policies, has an important role in improving the scientific research management level of universities.

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(2) To Focus on Scientific Research Data Integration

The focus of the development and mining of scientific research big data in universities is to integrate data from more platforms.[4] Developed countries are one step ahead in the construction and integration of data platforms and warehousing. For example, British universities have integrated research data storage and research publication storage, strengthened the construction of scientific research data catalogs, and linked scientific research data with publications, which is conducive to the discovery, acquisition and application of scientific research data. Developed countries are also keen to establish disciplinary data centers and institutional data warehouses. In order to increase the visibility and identification of data, they actively integrate different network platforms to form a nationwide universal search platform, increasing the convenience of data dissemination. For example, the United States has established a registration model of American universities and subject data centers, and relies on this model to obtain data information from multiple data centers and universities in the United States.

(3) To Emphasize Common Data Sharing

Scientific research data must be shared in order to truly play the role of data. Developed countries attach great importance to the commonality and sharing of data. In order to break the independence and specificity between platforms, many measures have been taken, and they are very good at absorbing international experience and promoting international exchanges and cooperation. For example, when the University of Bath in the United Kingdom formulated the data management plan, it referred to the data management plan developed by Monash University in Australia. In 2013, the European Union, the United States, and Australia established the Scientific Research Data Alliance, which is committed to removing obstacles and barriers to international data sharing and improving the standardization of international data, which has positive significance for promoting data-driven scientific innovation and development.

(4) To Establish Data Diversity Cooperation

The Royal Society published the research report Science as an Open Enterprise in June 2012, which has important reference significance for us to think about open science, open data, and scientific data management. The report reflects an advanced academic concept, and believes that data cannot be regarded as a private field of research, but requires the joint efforts of universities, research funders, government agencies and other organizations to participate in relevant cooperation, so as to achieve mutual benefit and win-win results. [5] At present, many universities in Europe have realized close cooperation among multiple departments when they carry out scientific research data management; and the communication and contact among libraries, government departments, IT departments and scientific research institutions have been continuously strengthened.

4.2 Enlightenment of Using Big Data for Scientific Research in Developed Countries' Universities

The results and experience of scientific research on the use of big data technology by universities in developed countries are worthy of study and reference by universities in other countries.

(1) In order to improve the discovery, utilization and development of big data, the other countries should strengthen the propaganda of big data, deepen the concept of big data, especially promote the concept and technology of big data among university researchers, and guide researchers to establish big data thinking from topics development, data sources, research and other aspects.

(2) The other countries should integrate multiple data platforms, break through barriers between different regions and fields, and establish a unified big data platform to achieve common sharing of scientific research data.

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(3) It is necessary to conduct scientific research cooperation with universities in developed countries, establish an international perspective, and improve the internationalization of data mining, research, and transmission.

(4) The other countries must strengthen the construction and matching of external data requirements and scientific research results databases, so that external scientific research management departments and university scientific research management departments can closely liaise to form a joint force to meet the needs of external economic and scientific and technological construction, and realize the transformation of scientific research data in universities.

References

[1] Xu Zhejun, Fu Yao (2014). Exploration of University Scientific Research Management Informationization in the Big Data Environment. Technology and Innovation Management, no.2, pp.46-49.
[2] Viktor Mayer-schonberger, Kenneth Cukier (2013). Big data: a revolution that will transform how we live, work, and think. Houghton Mifflin Harcourt, pp.189-190.
[3] Xu Lili (2015). Research on Scientific Research Data Management in British Universities. Library and Information, no.4, pp. 123-127.
[4] Yang Weirong (2015). Research on the Innovation of University Scientific Research Management in the Big Data Era. Science and Technology Management Research. no.14, pp. 1-4.
[5] The Royal Society (2012). Science as an Open Enterprise[R/OL]. The Royal Society Science Policy Centre report.
[6] Ministry of Education of the People's Republic of China http://www.moe.gov.cn/.
[7] Zhu Yong, Cui Yong, Yan Xujun (2017). Discussion on School-enterprise Cooperation Innovation in Higher Vocational Colleges. Science & Technology Innovation Review, no.1, pp.78-79.
[8] Hong Lin, Guo Leizhen (2016). Analysis on the Construction of Innovative Talents Training Model in Collaborative Innovation Centers of Universities in China. Chongqing Higher Education Research, no.1, pp.90-91.
[9] Ma Hongxia (2014). How to improve the quality of education and teaching in strict education and teaching management. Electronic Production, no1, pp.89-90.
[10] Li Yanling (2018). On the teaching of Chinese cultural translation in College English Education. Journal of Chongqing University of science and Technology (SOCIAL SCIENCE EDITION), no.3, pp.128-129-132.
[11] Zhang Zhongyou (2018). On the inheritance and dissemination of College English education and Chinese culture. File, vol.8, no. 34, pp. 152-153.
[12] Huang Ruijing (2017). An Empirical Study on the penetration of Chinese culture in college students' English test. Northwest University.
[13] Pang Lingjuan, Huang Yuhua (2017). Research on the application of micro class with Chinese culture as the theme in the cultivation of intercultural communication ability. Overseas English (1), no.2, pp. 90-91.
[14] Zhu Xiaomeng (2018). Translation of Chinese culture from the perspective of translator subjectivity: Taking exhibition publicity materials as an example. Overseas English (I), no.12, pp.120-121.
[15] Pang Lingjuan, Huang Yuhua (2017). Research on the application of micro class with Chinese culture as the theme in the cultivation of intercultural communication ability. Overseas English (2), no.2, pp.90-91.