

RESEARCH ON THE CONSTRUCTION OF MAKER SPACE IN CHINESE UNIVERSITY LIBRARIES

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ABSTRACT

As an innovative service model for university libraries to break through the traditional service model, maker space service is favored by the majority of teachers and students in universities, and it is also an inevitable product of the transformation and optimized development of university libraries in the new era. This study starts with the basic concepts of makers and maker space, expounds the current situation of the construction of maker space in Chinese university libraries, and focuses on analyzing the advantages and challenges of the construction of maker space in university libraries. Finally, it provides new ideas on how to build maker space in Chinese university libraries.

Keywords: University library, maker, maker space construction.

1. INTRODUCTION

With the rapid development of global information technology and the Internet, the service mode of university libraries has been quietly changed from the original closed, single and local service mode to an open and diversified service mode to meet the information needs of teachers and students in universities. In order to cope with the crisis, university libraries need to take advantage of traditional advantages to embed their unique information resources into the maker service in different carriers, and apply them to the construction and service of the maker space of various university libraries, which plays an important role in promoting the development of university libraries and is of great benefit to the cultivation of innovative talents in universities.

2. THE CONCEPT OF MAKER AND MAKER SPACE

2.1 concept of maker

The word "maker" is translated from the English word "maker", and is defined as a group of people who love innovation and practice. They share technology, exchange ideas, or learn from experience as their principles, transforming the cultivation of interests and the possibility of pursuing their own creativity into practical products or novel skills. Dale Darty, the father of maker movement, believes that makers love what they do, explore, discover, and create, with the core of "making life better" and constantly improving the quality of life. Makers always adhere to the scientific concept of openness, mutual assistance and sharing, and hope to share results and exchange experience with more people while experiencing creative feelings, attract more people to join the team of makers, and promote social and economic development.

2.2 Concept of maker space

"Maker space" is the carrier of the maker movement, which originated from a foreign journal "Maker Magazine". It is an open, free and shared place, gathering people with the same hobbies,

usually sharing knowledge in technology, machinery, digital, art, etc., discussing and exchanging experiences, cooperating with each other, co-creating, and realizing creative inspiration activities. In May 2013, the Shanghai Library Innovation Space was successfully established, marking the official entry of Chinese libraries into the maker space. Influenced by the upsurge of the maker movement, the maker space has also attracted the attention of all walks of life, especially the domestic university libraries to construct and explore the service platform for the maker space, and carry out diversified services such as intelligence, specialization, personalization, and interactivity.

3. CONSTRUCTION STATUS OF MAKER SPACE IN UNIVERSITY LIBRARIES

At present, university libraries all over the country have created their own unique maker space. The libraries of China Three Gorges University, Tianjin University, Shanghai Maritime University and Shanghai Jiao Tong University took the lead in establishing maker space in 2015 [1]. The maker space of university libraries serve teachers and students. The libraries provide them with open and free activity venues and high-quality literature resources, and realize their service model innovation through the extension of characteristic services of university libraries. Nowadays, the maker space of university libraries gives full play to the innovation potential of teachers and students, encourages interdisciplinary sharing and communication, constantly explores and improves the maker space, promotes the transformation of knowledge achievements, and enhances the service innovation ability of libraries to a certain extent. However, the existing service model of maker space in university libraries still needs to keep pace with the times to meet the changing needs of teachers and students, and lay a good foundation for the future construction of maker space in university libraries.

4. THE ADVANTAGES AND CHALLENGES OF CONSTRUCTING MAKER SPACE IN UNIVERSITY LIBRARIES

Today, university libraries are facing a special environment where opportunities and challenges coexist, and new and old service models intersect. It is a crucial period to meet the increasingly diverse needs of users in the information age, seek a path of change, realize the value of university libraries, and win their own survival and development space. The maker space has brought new opportunities for the transformation, development, and service model innovation of university libraries, but also faces enormous pressure.

4.1 Advantages of constructing maker space in university libraries

4.1.1 University libraries have abundant collection information resources

University libraries are important places for knowledge reserves, with abundant information resources covering multiple disciplines and fields. While enjoying the literature information and reference consultation services provided by the library for free, makers can participate in the relevant lectures and training, creative works exhibitions, and creative competitions held by the library every day, so that they are not limited to their familiar fields. But in a variety of innovative services, everyone can freely, equally, and openly use of collection resources to contact more fields, better stimulate their creative inspiration and experience the fun of innovation.

4.1.2 University libraries can provide professional information services

At present, the information services provided by university libraries involve many aspects, such as literature inquiry and borrowing, patent retrieval, checking and citing, subject information service, etc., providing convenient services for teachers and students to obtain information resources. In the process of the creation and sustainable development of maker space, the library's specialized information service plays an important role in promoting it. On the one hand, the staff in the library has a keen ability of information acquisition and analysis, and can make suggestions and brainstorm for the construction and development of the maker space in the library. On the other hand, on the basis of increasing the knowledge reserve of teachers and students, professional information services provide literature resources and technical support for the majority of makers to realize creativity, shorten the process of turning ideas into reality, accelerate the research of scientific research achievements in related fields, and enable the knowledge accumulation of makers and the combination of characteristic creativity to achieve a qualitative leap.

4.1.3 University libraries have open and free venues for activities

The university library is an open, free and highly inclusive activity venue, serving every teacher and student in the whole school. The library can bring makers with common interests together and provide a space for them to realize learning exchange and innovation. "A maker who likes cooking is a maker in the kitchen, and a maker who likes gardening is a maker in the garden." Do everything by yourself, experience it by yourself, and meet your individual needs through DIY. University libraries can also become the carrier of creative realization of makers. The maker space of university libraries can be freely chosen according to the interests of makers, regardless of the form, to fully realize the value of personal creation, constantly stimulate creative inspiration, burst out innovation enthusiasm and improve skills, so that more teachers and students who are interested in maker space are willing to stay in the maker space to create innovative results.

4.1.4 University libraries have the nature of public welfare

A university library is a university without walls, and its basic attribute is public welfare. It provides various knowledge, resources, and training to teachers and students on campus for free. The space for maker space in university libraries is generally transformed through the renovation of the interior space, which not only saves the cost of renting maker space, but also allows for the free use of existing high-tech equipment and tools in the library, greatly reducing the threshold for joining maker space and attracting more people to join the maker team. The creation of maker space in university libraries invisibly publicizes and promotes the maker culture of university libraries, providing a stage for realizing their creative ideas, stimulating the innovation interest of makers, and increasing the popularity of university libraries, in order to achieve the sustainable development of their maker space in the future.

4.2. Challenges of constructing maker space in university libraries

4.2.1 Challenges in funding sources and public welfare

The funding sources of university libraries are mainly national or local financial grants, which are relatively fixed and limited in amount, and some of them have clear use constraints. At present, there is no special fund for the construction of maker space. To ensure the normal operation of maker space in the later stage, relying on national or local financial grants is simply not enough, and sustainable development cannot be achieved. In order to maintain the public welfare of the maker space of university libraries, it is necessary to innovate the fund raising methods. The first

thing to be solved is the funds needed to carry out the maker space project. The quality of the equipment configured in the maker space directly affects the innovative service level of university libraries and the experience of teachers and students.

4.2.2 Challenges in the quality and management ability of librarians

Maker space is a new spatial service model created by the deep integration of traditional service culture and maker innovation culture in university libraries. This model endows librarians with more tasks, such as spreading maker culture and stimulating innovation vitality. Compared with traditional university library services, maker space services have higher requirements for the cultural literacy and management ability of librarians. The construction of maker space in university libraries faces challenges such as a shortage of professional talents and a lack of personnel with professional maker space management capabilities.

4.2.3 Challenges brought by transforming physical space

According to the different service contents of maker space in university libraries, there are also different requirements for physical space renovation and layout, rather than simply setting up a few more rooms. The traditional spatial design of university libraries is based on a "static" reading mode, while the spatial design of maker space in university libraries is an innovative mode with "dynamic" as the main focus and "static" as the auxiliary. This is a problem of breaking the original service mode and reorganizing the service mode. Faced with the integration of "static and dynamic" space transformation in university libraries, there may be difficulties in planning, designing, and transforming according to the needs of maker space, as well as many issues related to sound insulation effects and space area. How to integrate the physical space of university libraries and explore a path suitable for the sustainable development of maker space in university libraries are both huge challenges that university libraries need to face in building maker space.

4.2.4 Intellectual property risks and challenges faced by innovative achievements

The creators of university libraries have relatively weak awareness of intellectual property protection. While creating new knowledge achievements, they face one of the most complex and important legal issues, which is the issue of intellectual property. On the one hand, it involves how to avoid infringing on the knowledge and achievements of others during the creative process, and on the other hand, it involves how to protect one's legitimate interests from infringement during the creative process. How to carry out self avoidance of intellectual property risks and reduce infringement risks are a huge challenge that university libraries need to face in building maker spaces.

5. STRATEGIES FOR CONSTRUCTING MAKER SPACE IN UNIVERSITY LIBRARIES

5.1 Strengthen the publicity of maker concept and create a maker cultural atmosphere

Influenced by traditional educational concepts in our country, there still exists a phenomenon of low emphasis on practice. The hands-on practice and innovative concepts advocated by maker space still require university libraries to carry out extensive publicity and promotion of maker culture and spirit, attract teachers and students to enter library maker space, cultivate their ability to put creativity into practice, and become practitioners and disseminators of maker culture. University libraries should establish maker clubs and interest groups, create a maker culture atmosphere, cultivate their independent thinking ability, and do their best to help innovative and

entrepreneurial makers. They should timely disclose scientific research results and progress, stimulate and inspire the innovation enthusiasm of makers, and attract more teachers and students to join the maker army. University libraries can organize activities related to maker space to shorten the distance between teachers and students. For example, by introducing innovative entities to carry out activities, more teachers and students can integrate into maker space from contact to recognition, allowing observers and maker experts to communicate face-to-face, continuously learn new knowledge, explore and share creative inspiration, cultivate their interests and hobbies, and carry out innovative activities in their respective fields. University libraries can also organize regular lectures on maker space research topics, creative works exhibitions, maker creative competitions, and maker creative knowledge quizzes to guide teachers and students to participate widely and share their wonderful lives. In addition, university libraries can also use promotion methods such as the school website, WeChat official account, official microblog, library electronic display screen, and hanging banners in the hall of entry to increase the publicity of maker space, so that more people can understand the concept of university library maker space, understand the development trend of maker space, and constantly promote the development of maker space.

5.2 Develop financing channels for maker space and allocate funds reasonably

The construction of maker space in university libraries not only requires a large amount of investment in the early stage, but also needs to do a good job in upgrading, maintaining, and updating equipment in the later stage to fully ensure the sustainable development of maker space. It is necessary to broaden the financing channels of maker space, plan funds reasonably, and use every penny on the cutting edge. On the one hand, the initial start-up funds for the construction of maker space in university libraries can seek support from school leaders, apply for school funding, continuously improve the quality of maker achievements in the later stage, seize national policy support, and strive for national special policy subsidies and school special research funds. On the other hand, the funding for the construction of maker spaces in university libraries can adopt a cooperation model between university libraries and enterprises, optimize maker teams, graft high-quality project sources, transform maker achievements into high-quality and powerful sales products, attract enterprise investment sponsorship, and effectively use public capital to solve the problem of funding shortage for maker projects. At the same time, university libraries can also mobilize various network resources through donations and sponsorships organized by various social organizations, such as alumni associations, civil organizations, maker enthusiasts, etc., to provide practical assistance in building maker space and provide basic guarantees for the long-term development of maker space.

5.3 Explore and cultivate innovative talents to improve the service level of the maker space

University libraries must explore and cultivate high-quality professional talents, meet the needs of different science and technology creators, and improve the management and service level of maker spaces. Firstly, university libraries can explore excellent librarians with solid library information skills, rich disciplinary knowledge, and proficient computer skills within the library, providing professional, personalized, and creative services for maker space. At the same time, we will develop a regular training plan for maker service librarians, supervise them to learn new businesses, continuously develop distinctive service projects, improve service systems, innovate service mechanisms, and comprehensively enhance their awareness and management ability of

maker space services. Secondly, university libraries can invite experts and professors from different disciplines, such as professors who can be included in the teaching workload. It is best to assign makers from different backgrounds to corresponding maker projects, conduct regular scientific research guidance, and provide technical support; In addition, senior innovation and entrepreneurship experts can be invited to provide targeted guidance on innovation projects, hold lectures or on-site guidance from renowned experts, share successful case experiences, and organize subject librarians to collect feedback information on site, actively solve detailed problems found at the training site, and provide new penetrating follow-up services for makers. Finally, university libraries should actively mobilize teachers and well-rounded student volunteers from various departments and disciplines on campus, join the management service team of maker space, and actively provide follow-up services to various types of makers. Whenever makers need them, they should boldly try, gradually transforming the teachers and students of volunteer services within the school from managers to self managed and self created talents, and creating together with them, Continuously injecting fresh blood into the maker team, innovating the original service model of university libraries, deepening the extension of library services, fully utilizing space, promoting innovative resource sharing among teachers and students, generating more innovative achievements, gradually advancing the pace of building maker spaces in university libraries, enhancing students' innovative awareness, expanding innovative thinking, and cultivating their habit of lifelong learning, Cultivate innovative talents to promote the development of various industries in society.

5.4 Reasonably plan physical space and create an effective learning environment

The reasonable layout of physical space is also the key to the sustainable development of maker spaces in university libraries. The first consideration for planning and constructing maker physical space in university libraries is to conform to the actual situation of the library. All things should start from the actual situation of the library, and carry out a real survey according to the professional Settings, teachers and students' needs, and cost input of the school, so as to strive to build a maker space that meets the needs of teachers and students of different majors at the least cost. Once the maker physical space in university libraries is built, it will inevitably change the original physical space. It is necessary to choose the location of the maker space, try to stay away from traditional service areas or choose sound insulation equipment, handle the relationship between makers and readers, and create a comfortable learning and creative environment for people.

5.5 Establish university library maker alliance and maker exchange and interaction platform

In the construction of maker space, university libraries can also cooperate with other university libraries and relevant institutions to establish a maker alliance of university libraries, provide online communication and interaction platforms for makers, and realize cross-space and cross-regional connectivity [3]. On the one hand, the online communication and interaction platform for makers is convenient for peers to comment on each other, exchange and cultivate fresh ideas or give different opinions. In the continuous communication, the shortcomings of the physical maker space are supplemented, and the innovation achievements are further optimized. On the other hand, the construction of online service platform of maker space will become a link between university libraries and other universities, scientific research institutions, enterprises, etc., so that university libraries can seek new partners in maker space, quickly solve technical problems

with collective wisdom, realize resource sharing, and improve service quality [4]. University libraries provide intelligent, diversified and personalized services to makers through inter-library maker collaboration services and sharing mechanisms [5].

6. CONCLUSION

With the emergence of makers and maker space, the service model of Chinese university libraries has undergone earth-shaking changes, which is a beneficial attempt to adapt to social development in response to the changes of the times, and has important practical significance for the development of China's overall library cause. At present, the construction of maker space in university libraries still has a long way to go. With the joint efforts of more professional library staff and visionary people with innovative ideas, the maker space in university libraries will usher in new opportunities for development, achieve rapid development, and provide beneficial enlightenment for the cultivation of innovative talents in universities.

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