

RESEARCH ON THE CONSTRUCTION OF FUTURE LEARNING CENTER OF UNIVERSITY LIBRARIES

Pan Xin

Zhejiang Normal University, Jinhua, Zhejiang, China

<https://doi.org/10.54922/IJEHSS.2025.0956>

ABSTRACT

The future learning center of university library will become a new position to cultivate higher talents. This paper expounds the connotation, characteristics and necessity of the future learning center construction in universities, analyzes the current situation of the future learning center construction in university libraries, and finally discusses the strategy of the future learning center construction in universities.

Keywords: University libraries, future learning center, learning space.

1. INTRODUCTION

As one of the important strategic resources in libraries, the value and importance of space are self-evident. "Compass Report on the Modernization of University Libraries" points out that spatial construction is the key to achieving modernization and high-quality development of university libraries. Against the backdrop of rapid development of digital technology, the traditional spatial layout of libraries based on book collections and reading rooms can no longer meet the diverse needs of users. The transformation and development of library space[1], as well as the construction of smart spaces, have become the trend. In December 2021, Wu Yan[2], then Director of the Higher Education Department of the Ministry of Education, proposed to encourage universities to pilot the construction of a number of "future learning centers" based on libraries. Through the integration of literature resources and the reconstruction of spatial processes, smart learning spaces will be constructed, exploring team based, collaborative, and thematic learning. University libraries will be built into information service centers, student learning centers, and teaching support centers, reforming traditional talent training models, and exploring new paradigms for educating people in the new era. The proposal of the "Future Learning Center" is a deepening understanding of the physical spatial functions of university libraries, and also an important opportunity for university libraries to achieve spatial intelligence transformation and transformational development.

2. THE CONNOTATION AND CHARACTERISTICS OF THE CONSTRUCTION OF FUTURE LEARNING CENTERS IN UNIVERSITY LIBRARIES

(1) Digitalization and Intelligence of Space Resources

Digital resource services are the focus of future learning center construction. Based on the concept of future learning center construction, university libraries focus on the integration of physical and virtual space resources, and actively promote the digitization of collection resources. There are already hundreds of libraries around the world using 3D modeling technology to digitize and present their collections of literature in a three-dimensional manner on the "Second Life" virtual platform. Users can search and read their collections in the virtual library. Guided by the

concept of future learning center construction, university libraries are gradually introducing intelligent technologies such as artificial intelligence, blockchain, and virtual reality, as well as smart devices such as 3D printers and smart bookcases, to assist in the transformation of library space towards intelligence. These methods can be used, such as using intelligent sensing devices to control the temperature, humidity, lighting, noise, etc. of the space; utilizing intelligent question answering robots to achieve humanized and ubiquitous interaction between users and machines; utilizing intelligent inventory robots to achieve precise and reliable fully automated book inventory.

(2) Diversified and flexible spatial functions

At present, the future learning centers built by university libraries are no longer satisfied with achieving a single spatial function, but rather diverse spatial functions. Integration is its development trend and significant feature. The diversified development of spatial functions is closely integrated with the diverse needs of users, such as setting up quiet learning areas and interactive communication areas for different user needs. Quiet learning areas create a quiet and focused learning atmosphere for users, providing them with a good environmental support for deep thinking and scientific research; The interactive communication area has the characteristics of openness and sharing, where users can engage in group discussions, exchanges, and share experiences around a certain topic, thereby promoting ideological collision and academic innovation. The spatial structure of the Future Learning Center has strong scalability and flexibility. Specifically, university libraries can use modular, movable, and detachable furniture to create flexible spaces, ensuring that the spatial structure can be flexibly reorganized and expanded with technological development and changes in user needs. The library of Beijing University of Science and Technology has designed and renovated the leisure reading area in the central hall, creating a combination of circular leisure reading seats and side tables around the original columns in the reading area. Students can move and flexibly match the side tables according to their reading needs.

(3) Personalized and integrated spatial services

Zhu Yongxin[3] believes that personalization and customization will become the main characteristics of future learning. The future learning center of university libraries can construct a user's knowledge and ability profile, combine users' natural attributes, interest attributes, social attributes and other data to deeply explore their needs and preferences, recommend personalized learning resources for them, and create a suitable learning environment; It can also achieve precise and fine-grained recommendations based on situational awareness technology, and obtain real-time information and behavior data of users in different scenarios through sensor interaction devices. On the basis of helping users learn independently, personalized services that fit their personal style and abilities can be provided. The future learning center of university libraries can introduce generative artificial intelligence technology and equipment, enabling users to have smooth and repetitive conversations with AIGC models. AIGC models rely on natural language processing technology, context aware technology, self attention mechanism, and other techniques to answer various questions asked by users. At the same time, they have strong self-learning ability, can understand the context and interact with users in real time, question and correct the user's consultation content, thus achieving deep perceptual integration between users and machines in bidirectional interaction.

3. THE NECESSITY OF BUILDING FUTURE LEARNING CENTERS IN UNIVERSITY LIBRARIES

The application of information technologies such as big data, Internet of Things, block domain and meta-universe in higher education has brought profound changes to university students' learning habits and way of thinking. As the "second classroom" of university students' learning, university libraries need to be redefined and empowered to adapt to future learning. The construction of future learning centers in university libraries is not only the need of the construction of a learning society, the need of the reform and development of higher education, but also the need of students' personalized and customized learning.

The library's participation or leading in the construction of future learning centers can promote the reconstruction of library system, realize the service reform thinking that takes readers as the center and talents training as the goal, and fulfill the reshaping of university library functions. The construction of future learning centers can promote the transformation of library services. In the process of digital empowerment education, university libraries have broken through the traditional functions of collection and borrowing, gradually transformed from the three aspects of space, resources and services, and made use of digital empowerment to build libraries into integrated diversified learning Spaces.

4. ANALYSIS OF THE CURRENT SITUATION OF THE FUTURE LEARNING CENTER CONSTRUCTION IN UNIVERSITY LIBRARIES

In 2015, according to the three levels of "teaching", "learning" and "use" of the learning center, the library of the University of Science and Technology of China carried out a spatial transformation of the Western District Library and named it "Future Learning Center". The center was put into use in April 2016, and the built open sharing space, teaching support space, learning support space and innovation support space meet the needs of students for personalized, diversified and flexible learning. Subsequently, Shanghai Jiaotong University, Xi 'an Jiaotong University, Beijing Institute of Technology, Shanghai International Studies University and other domestic university libraries have started the construction of future learning center practice. The University Library Development Forum held in Harbin in July 2023 took "Future library space construction and service imagination" as one of the sub-themes, and invited industry experts to give suggestions on "future learning center construction" in the round table stage [4]. University libraries and drawing committees in Shandong Province, Shanghai City and Jiangsu Province successively held seminars on the construction of future learning centers, and discussed the construction ideas, design framework and spatial remodeling of future learning centers. More and more university libraries, such as Nanjing University Library, Sichuan University Library, Xi 'an University of Architecture and Technology Library, have begun to plan the construction of future learning centers. In general, the construction of the future learning center takes the application of new technology and the construction of new space as the main content, and its construction effect needs to be further verified.

5. STRATEGIES FOR THE CONSTRUCTION OF FUTURE LEARNING CENTERS IN UNIVERSITY LIBRARIES

5.1 Updating the concept and clarifying the goals of talent cultivation

The demand for talents in society is becoming more diversified, such as academic talents in basic research, applied talents in technological innovation, and technical talents in industrial

transformation. Universities are important battlefields for talent cultivation. Faced with the talent needs of national development and the education model of university reform, university libraries promote interdisciplinary learning experiences through future learning construction, build a composite talent cultivation model for higher education, empower efficient integration of teaching and research, and explore and update the industry university research system. Individual value responds to social needs, and the realization of social value is the guarantee for individual self-improvement and comprehensive development. After entering society, individual development has not stopped. The value transformation from the "first classroom of talent cultivation" in higher education to the "second classroom of library" that adapts to society, realizes individual ontological value, helps individuals grow, and derives development value. The Future Learning Center is a new learning format that answers social development, changes in the pattern of higher education, and personal life growth. It integrates space, resources, services, technology, and facilities to provide personalized learning solutions. In response to national strategic needs, the Ministry of Education has launched a pilot program for future learning centers based on national university libraries, clarifying the role of libraries in the construction of future learning centers and promoting the transformation of modern education models in higher education that are in line with national conditions. The reform of talent cultivation mode guided by policies provides strategic development direction for libraries. In the context of the times, the construction of future learning centers is the mission of libraries, and it is also the internal driving force for libraries to explore more functional forms, functional models, and growth transformation[5].

5.2 Professional team and talent development for librarians

Talent is the primary resource. Building a strong librarian team not only provides talent support but also serves as an organizational safeguard for empowering the development of Future Learning Centers. The library talent support system for Future Learning Centers should focus on key elements such as organizational mechanisms, personnel communication, talent development, team building, collaboration, project incentives, and performance evaluation. To deliver exceptional services and enhance the service quality and academic influence of Future Learning Centers, the professionalization of librarian teams should prioritize three aspects:

(1) Policy Support from Personnel Management and Deepened Organizational Reform

Establish a leadership group, an expert team, and task-specific working units—collectively forming a unified "one-center" structure—to build an institutional framework that supports the organizational and personnel architecture of Future Learning Centers.

- The leadership group designs top-level mechanisms and plans, overseeing overall strategic deployment.
- The expert team provides professional consultation, technical guidance, and advisory support.
- Task-specific working units, composed of professionals from various departments, are responsible for executing the operational tasks of the Learning Centers. Emphasize the alignment of librarians' disciplinary expertise and academic qualifications with functional roles across departments. This ensures both the advancement of core library operations and the synergistic collaboration needed to achieve the goals of Future Learning Centers.

(2) Guided Cultivation and Continuing Education for Professional Growth

Enhance librarians' expertise through regular professional training, including theoretical study, practical operations, skill development, and service expansion. Libraries should adopt flexible lifelong learning mechanisms, combining online and offline training to provide ample career development opportunities and diverse on-the-job training programs. These initiatives aim to upgrade skills, unlock librarians' potential, and foster sustainable talent growth.

(3) Maintaining "Metabolism" and Motivating Active Participation

Strengthen talent team orientation and training demands to improve librarians' professional capabilities, while diversifying learning channels. Librarians' competencies should encompass not only foundational disciplinary knowledge but also service-oriented skills, academic information literacy, expanded service capabilities, quality enhancement, and efficiency optimization. Librarians must demonstrate passion for the library and information science profession, along with a commitment to the mission of Future Learning Centers. In practice, their roles extend beyond knowledge dissemination and resource management to include driving academic research, leading innovative applications, and promoting community engagement through activities. By integrating these strategies, librarians will contribute their expertise and experience to the development of Future Learning Centers, positioning themselves as pivotal forces in advancing academic innovation and service excellence.

5.3 Integrating resources and building a knowledge service platform

The integration of literature resources in the future learning center should not only organize resources according to the unit of measurement, but also consider the characteristic analysis of resources, enrich the literature types from the perspectives of the construction mechanism of literature resources, resource development, resource opening and resource utilization, and refine the granularity of resources in the literature organization. It also should focus on resource content, discipline background, intellectual property, product form, transmission path, delivery services and so on. The future learning center of the library is embedded in the whole process of teaching, scientific research and learning, and strengthens the semantic correlation and knowledge reorganization of resource content. The construction of literature flow needs to expand the accumulation of special collection resources, the mining of original resources, the depth of resource content, and the adaptability of literature resource services to users. In the future, the resource supply of the learning center will break through the traditional unified resource model, gather diversified resources into various carriers, and visualize the form of knowledge presentation, including but not limited to video, video, 3D image, virtual reality, etc., to convey vivid images, promote the all-media transformation of literature resources, and improve learners' perception, recognition and absorption of learning content and deepen their understanding. To meet learners' academic interests, it should establish a digital knowledge resource system and service platform, realize intelligent resource retrieval, assist users to write literature review and thesis outline, and support interactive knowledge discovery, covering voice retrieval, image recognition, mobile vision, cross-library retrieval, etc. The Future Learning Center supports the transformation of learning methods, promotes the library to get rid of the dependence on paper and electricity resources, builds the knowledge network map, and establishes the ecological mechanism of literature resource utilization for learners' lifelong learning. In addition, it should expand the

communication channels for the utilization of literature resources, carry out knowledge indexing, text mining, and multi-source heterogeneous integration, narrow the distance between learners and knowledge, deeply integrate online resources and offline education, and apply apps, wechat mini programs, mobile online live broadcast platforms, and interactive teaching platforms. It also should provide online MOOCs, textbooks, teaching AIDS, e-teachers, teaching activities, virtual classrooms, social practices, etc., for learners to create a future learning center to create the possibility of learning anytime, anywhere.

5.4 Technological Advancement: Empowering Learning Scenarios with the Metaverse

In 2023, the 88th World Library and Information Congress identified artificial intelligence (AI) as one of the key technologies shaping the future of libraries [6]. The construction of future learning centers is not merely a spatial reconfiguration, but a systematic upgrade of libraries. To address evolving demands for talent development, higher education transformation, and a learning-oriented society, libraries are transitioning from knowledge service providers to learning ecosystems. This role shift requires technological empowerment, where applied technology serves as both the foundational driver for learning systems and a functional leap in exploring innovative library services. The metaverse reconstructs the material world of learning systems, integrating diverse disciplinary learning spaces, real-time interactive mentor hubs, collaborative research environments, resource-rich literacy zones, and practical maker spaces. For each of these spatial clusters, the metaverse employs "learning radar" to map and structure knowledge within VR scenarios, linking disciplinary contexts to facilitate activities such as knowledge competitions, translation-based teaching, and topic discussions. It automatically records learning interactions and user knowledge trajectories, enabling precise recommendations of relevant resources. Leveraging AI-driven virtual technologies, the metaverse merges physical and digital realities to achieve seamless human-environment integration. This fosters cross-domain human-machine collaboration and creates immersive scenarios that drive innovation in cooperative and interactive learning methods. Contextualized learning environments cater to users' advanced educational needs. AI-powered future learning scenarios empower centers to become "boundaryless learning spaces." Open learning communities integrate diverse resources and spaces, attracting broader participation. Libraries, as hubs for comprehensive learning support, continuously host knowledge innovation activities—sparking ideas, enabling brainstorming, forging new connections, and aggregating optimal resources—to enhance user learning experiences. ChatGPT, a flagship example of AI technology, is transforming key library functions such as resource referencing, information services, and consultative retrieval. By integrating AI and ChatGPT, libraries enable intelligent services that boost user efficiency and redefine the landscape of information reference systems.

5.5 Customer-Centric, Precision-Tailored Intelligent Services

By integrating artificial intelligence with big data analytics, the learning center excavates user data and tracks learning behaviors to construct detailed user profiles. High-quality service content enables precision-targeted and intelligent content delivery, providing exclusive customized smart services tailored to individual needs. The system anticipates learners' requirements, pushes preferred resources, curates personalized learning plans, matches professional mentors, and delivers highly accurate, precise, and refined academic resources and services. Personalization and

customization represent the future of education, advocating self-directed learning and empowering users to autonomously design their learning experiences across dimensions of time, location, content, and methodology.

The precision-targeted service ecosystem integrates "collection, borrowing, reading, studying, research, and leisure," creating a tangible, measurable learning environment. This system comprises:

This framework establishes a smart, professional, and user-centric literature resource hub and self-service platform, ultimately realizing the vision of individualized "one-person-one-portal" learning ecosystems.

(1). Library backend infrastructure

(Desktop management systems, cloud control centers, server operations)

(2). Integrated management clusters

(Automated library management, interlibrary loan services, smart spaces, analytical decision-making, information services, mobile libraries, seat/research room reservations, big data analytics dashboards, digital libraries)

(3). RFID-enabled smart services

(Self-checkout/return, anti-theft gates, intelligent book carts/shelves, 3D navigation, book positioning, self-service reservation/pickup)

(4).Self-learning facilities

(Digital resources, e-ink readers, multi-screen cloud computing, 3D printing, VR/AR stations, holographic displays).

6. CONCLUSION

The construction of future learning center of university libraries are not only the need of the construction of learning society, but also the new round of development opportunity in the field of library space construction of China's higher education in the new era. University libraries should give full play to their main role, always take user needs as the guide, and cooperate with secondary colleges, administrative departments and off-campus institutions on the basis of the previous spatial reconstruction practice to jointly create a multi-functional smart space with teaching, learning and innovation as the core under the mechanism of clear division of labor. The future learning center will be built into an open, sharing and collaborative modern intelligent functional body.

REFERENCE

[1] Lin Xiaotong. Research on Spatial service of University Library in Fuzhou University Town [D]. Fuzhou: Fujian Normal University, 2022.

[2] Wu Yan. Accelerating the modernization of University Libraries to help the high-quality development of Higher Education [J]. Journal of University Library, 2022 (1) : 7-8.

[3] Zhu Yongxin. Future School: Redefining Education [M]. Beijing: CITIC Publishing Group, 2019:153-182.

[4] Sun Peng, Wang Yu, Liu Xinyong. Construction of future learning Center in university library: origin, present situation, confusion and path [J]. Library and Information Work, 2019, 68 (6) : 12-20.

[5] Sun Peng, Wang Yu, Liu Xinyong. Construction of future learning Center in university library: origin, present situation, confusion and path [J]. Library and Information Services, 2024 (1) : 34-39.

[6] IFLA. IFLA WLIC 2023 [EB/OL]. [2023-07-20]. <https://2023.ifla.org/>.