Design of Intelligent Library Service for Vocational Education in Middle School under Machine Learning

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Abstract: Smart library is an important part of the educational environment in the digital era, especially in the middle school education system. It is not only the warehouse of knowledge information, but also the forefront of learning mode innovation and the application of educational technology. The construction of smart library plays a great positive role in promoting middle school education, and has outstanding performance in promoting educational informatization and promoting the cultivation of students independent learning ability. Starting from the resources, services, and management of smart libraries, this paper reviews the application of machine learning in smart libraries. The scenarios where machine learning is applied to resource aspects include ancient book organization and digitization, knowledge discovery and prediction. In service aspects, it includes personalized search, personalized recommendation services, and personalized consulting services. In management aspects, it involves procurement decisions, automatic document classification, and intelligent shelving. Based on the current application of machine learning in libraries, this paper proposes development strategies that emphasize strengthening top-level design, promoting phased implementation, and collaborative development. With the requirement of modern information of education management, algorithms in library and education management. These high-level achievements enable us to better and higher vision in the research of intelligent library education management from the perspective of philosophy and mathematical logic, to a more tolerant and broader vision to knowledge transfer and integration and application; to more rigorous and in-depth wisdom for knowledge mining and analysis and enrichment.

Keywords: artificial intelligence; machine learning; intelligent library; learning motivation; vocational education

1. Introduction

In the contemporary Chinese society of knowledge economy, the educational task of the country has shifted from "elite education" to "mass education", and is committed to distinguishing and developing the talents of all students and improving the quality of all the people. In the development stage of the popularization of education in China, how to meet the strong desire of most people to receive vocational education, but also to ensure that the reading quality of middle school books does not decline or gradually improve, so as to cultivate high-quality talents to meet the social development and professional needs, has become the primary task of library service function. In the context of the digital age, the importance of reading promotion in smart libraries, as core institutions of information services, is increasingly highlighted. The key role and strategies of smart libraries is in reading promotion. By enhancing the reading literacy of the whole nation, promoting the balance of educational resources, and fostering cultural heritage and innovation smart libraries have made significant contributions to the development of social culture. Through five strategies, including data-driven, AI-empowered, integration of new media, smart management, and service models. In the environment of machine learning, to optimize the process of reading promotion, expand the channels of promotion, enhance reading experience and interactivity, and create a divers reading environment. The implementation of these strategies will provide strong support for the reading promotion work of smart libraries, and promote the in-depth popularization and development of reading culture [1]. Library as a social information center, over the years has been advancing with The Times, on the basis of solid business ability actively face the information age challenges, automation management, fully open services, digital library, 24 hours ATM, self-service system, mobile phone library, library media, the library has been in those routes, in order to make their own services and resources become the social cultural consumption necessities, improve social well-being. Nowadays, the global spread of artificial intelligence technology poses a greater challenge to the development of libraries.

2. Definition of Core Concepts

2.1 The Development Status and Importance of Smart Library

Starting from the resources, services, and management of smart libraries, this design reviews the application of machine learning in smart libraries. The scenarios where

machine learning is applied to resource aspects, including ancient book organization and digitization, knowledge discovery and prediction. In service aspects, it includes personalized search, personalized recommendation services, and personalized consulting services. In management aspects, it involves procurement decisions, automatic document classification, and intelligent shelving. Based on the current application of machine learning in libraries, this design proposes development strategies that emphasize strengthening top-level design, promoting phased implementation, and collaborative development [2]. There is no unified standard definition of smart library, but it is generally believed that it is a development form of library under the promotion of digitalization, network and intelligent technology. The concept of smart library can be traced back to 2003, and was proposed by Markus Aittola of the University Library of Oulu in Finland in his article Smart Library-Location-Aware Mobile Library Service [3]. Then, as IBM put forward the concept of "wisdom", wisdom library began to receive wider attention and research, wisdom library by integrating books data, digital resources and space resources, based on comprehensive information, using big data intelligent analysis platform, realize intelligent and personalized library management and service, so as to optimize the user experience.

2.2 Middle School Wisdom Library

Compared with traditional libraries, middle school smart library especially emphasizes the combination of interaction and educational functions. Through Internet technology, library services are more close to students learning needs and education mode. The construction of smart library has formed a relatively mature theoretical and practical mode. School intelligence libraries in the United States, Europe and Japan generally adopt highly integrated information systems and advanced digital technology, and continuously optimize library services through data analysis and user behavior research. Foreign research focuses on how to use technology to improve user experience and management efficiency, as well as how to protect user privacy [4].

3. Wisdom Library Based on Learning Motivation and Cognition

The purpose of this study is to explore and practice the construction and development of middle school wisdom school, optimize the allocation of resources and improve the utilization rate of middle school education resources through the construction of wisdom school, use AI and other technologies to provide personalized learning suggestions, innovate teaching and learning methods, enhance learning experience, wisdom school can provide equal learning resources for middle school students in Daxing area, and promote educational equity [5]. This study is of great significance for promoting regional education informatization and modernization of teaching, and has a far-reaching influence on optimizing the allocation of educational resources and improving the quality of education. Artificial intelligence service and intelligent library are the key topics of libraries in recent years, and its attention is closely related to The Times. How to apply the artificial intelligence service and the intelligent library to the library reasonably and effectively has become a problem worth studying.

At the 5th International Mobile Library Conference, as of International M-Libraries Conference held in 2014, new services such as mobile library applications, teaching assistance applications, virtual campus applications and wearable devices have been put into use in the participating countries, among which the location applications are particularly prominent. There are many libraries or campus apps related to location, such as resource positioning, virtual campus, QR code guide, alumni interaction, etc [6]. The information required by users is closely related to geographical location, and access to location-based special information in a specific location will bring a good user experience, which is one of the advantages of mobile devices.

Orienting towards the data management problem of user portraits in smart libraries of colleges and universities, we actively give full play to the positive role generative artificial intelligence under the machine learning system in data management of user portraits, and improve the strategy of data collection, processing, storage and security management of library user portraits. It is using the deep learning technology of generative artificial intelligence of machine learning to collect the data of library user portraits in a refined way, and expand the scope of the user's portrait data authority [7]. With the help of the natural language processing technology of machine learning generative artificial intelligence, the user's portrait data is deeply excavated, and the library user's portrait processing trust mechanism which aims to protect the user's right to know and choose is soundly established. Distributed storage of user profile data by taking advantage of the neural network storage technology of machine learning generative artificial intelligence, and enhancing the structural, systematic and stable storage of user profile data. It is relying on the generative adversarial network technology of machine learning generative intelligence to consolidate the security foundation of user profile data management and crack the bottlenecks such as malicious collection, illegal modification and privacy leakage of user profile data [8].

On a global scale, artificial intelligence + mobile Internet presents a blowout development. As an organization that collects, arranges, preserves, develops and pushes information resources, libraries must meet the development of technology and public needs, and think about the service innovation and development path of intelligent library under the thinking of mobile Internet. Supported by the power of explanatory AI machine learning theory and learning and cognitive concept, this topic conducts empirical research on the form and trend of intelligent library service, finds and summarizes the rules, and summarizes and summarizes the practical results. The value and significance of this research is to provide reference for decision-making for the

construction and development of intelligent library service system. Middle school students have the problems of weak learning motivation and poor clarity. The research system for the construction of intelligent library aims to promote modern evaluation technologies such as learning motivation and cognitive intervention of middle school students to promote and guide students forward learning, and promote the enlightenment efficiency of smart library to drive new quality productivity in vocational education learning [9].

Technology-driven service innovation: Explore how to promote the innovation of service mode through technological means, especially AI and big data.

User experience optimization: To study how to improve the library use experience of students and teachers through intelligent space design and intelligent service.

How to effectively integrate and use digital resources, the technology and management in the construction of smart library face more severe challenges. How the smart pavilion supports the personalized and differentiated needs of education is the main trend in the future.

4. Development of Services for the Characteristics of Mobile Terminals

Start with the fragmentation of traditional library service content, micro-content aggregation, development of new services that fit the characteristics of mobile terminals, and integration with mobile SNS; the service can be developed around an individual, a topic, a carrier or a specific group, and create a micro-content platform. Construction of smart library: data resources, digital facilities, smart space and smart services.

Data resources (A): including electronic books, electronic journals, databases and multimedia resources, providing basic content and information for intelligent libraries.

Digital facilities (B): covering big data, cloud storage and computing platforms, mobile network devices, etc., ensuring data processing and storage capabilities, and supporting advanced functions such as AR / VR.

Smart Space (C): The combination of physical and virtual space, which provides a flexible and creative learning environment through human-computer interaction and collaboration, intelligent furniture and environment control.

Intelligent service (D): Using AI technology to provide borrowing, heuristic reading and learning, chatbots, personalized recommendation and other services,

Enhance the learning experience and efficiency.

5. Framework Analysis of Research on Key Points and Difficulties

5.1 Research on Intelligent Library Construction Based on Learning Motivation and Cognition

The CBQ scale has two dimensions: one is depression, and the other is cognitive distortion, which consists of cognitive bias in 4. Using CBQ to evaluate middle school can evaluate the effects of negative emotions and cognitive bias in the face of self-acceptance and specific learning environment and future work. Classical learning motivation theory believes that students should focus on intrinsic learning motivation, supplemented by exogenous learning motivation. In our group tutoring intervention, try multiple intervention, namely learning motivation multiple orientation, self-acceptance multiple orientation, help the intervention students to establish personalized learning motivation, and guide with a realistic realization path.

5.2 Study subjects

Mainly for middle school students, the male and female students are selected according to a certain proportion of statistical samples. According to their academic performance, students are divided into students with good academic performance (top 25% in the main subjects), poor students (25% in the main subjects), and the rest are middle students with academic performance.

Smart library is an important part of the educational environment in the digital era, especially in the middle school education system. It is not only the warehouse of knowledge information, but also the forefront of the learning mode innovation and the application of educational technology. The construction of smart library plays a great positive role in promoting middle school education, and has outstanding performance in promoting educational informatization and promoting the cultivation of students independent learning ability [10].

6. Outlook and Summary

In the digital information age, new media technology, with its characteristics of universal reach, instant speed, interconnected interaction, and multidimensionality, has profoundly transformed people's lifestyles and information acquisition methods. Under the backdrop of new media, university libraries, as specialized institutions for literature information services, face significant challenges and opportunities. New media technology provides an innovative platform for university library information services, not only enhancing service quality and efficiency but also better meeting readers' personalized and diverse information needs. It is imperative to expand and innovate reader services in university libraries. Modern university libraries will encounter new challenges in all aspects of reader services, including the optimization of traditional services and the exploration of innovative services.

Data and machine learning can provide significant reference value for the development of intelligent library service decision-making systems. Currently, data and machine learning have not received adequate attention in the services and research of smart libraries, which results in many hidden data resources failing to fully empower the intelligent library service decision-making system. Hidden data runs through the characteristics, classification, and principles followed by smart libraries. Furthermore, based on existing data governance maturity models, a framework for an intelligent library service decision-making system composed of data resources, data computation, data analysis, and data presentation should

be constructed. Finally, strategies for empowering the development of the intelligent library service decision-making system with hidden data should be implemented.

In the future, the focus will be on using DeepSeek as a pivot to develop generative AI technology based on the breakthroughs in DeepSeek technology. Through a revolutionary reorganization of the existing generative AI landscape, the emphasis will be on the library industry. The AI application model will consider three dimensions: transforming and upgrading smart libraries, improving personalized digital humanities services to enhance life, and providing differentiated development support for libraries. The future transformation of smart libraries driven by generative AI and the differentiated development of libraries in the AI era will be a new breakthrough.

In the future, more attention will be paid to the qualitative and quantitative research of AI and machine learning. For example, in the measurement statistical analysis, the data model closer to the actual situation is used for the automatic computing mode of clustering, such as artificial intelligence and machine learning, and neural network. Make the technical analysis results more specific and have practical operational significance. The 2021 National Seminar on Higher Vocational Education has once again put forward higher requirements for the application of automation technology and technology improvement in education management. With the requirement of modern information of education management, algorithms in library and education management. These high-level achievements enable us to better and higher vision in the research of intelligent library education management from the perspective of philosophy and mathematical logic, to a more tolerant and broader vision to knowledge transfer and integration and application; to more rigorous and in-depth wisdom for knowledge mining and analysis and enrichment.

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