Personalized and Accurate Recommendation of Higher Vocational Students' Learning Content Based on Big Data

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Abstract: Data-driven personalized learning is gradually becoming a reality. Personalized learning service aims to meet learners' personalized, precise and intelligent learning needs. Online recommendation system can automatically identify learners' personalized needs and actively recommend learning paths that meet users' needs, thus improving the personalized service level of online learning system. As national applied high-quality technical talents, higher vocational students' individualized development not only meets their own development needs, but also caters to the development direction of social talent needs. Online learning systems usually contain a lot of learning content, and it is often difficult for learners to find the learning path that best meets their needs. Therefore, under the background of big data era, personalized learning of higher vocational students is an important topic worth exploring. This paper discusses the personalized and accurate recommendation strategy of higher vocational students' learning content driven by big data.

1. Introduction

As the new engine of education development in the era of "internet plus", big data's thinking and technology are driving the changes and innovations in scientific decision-making, intelligent management, precise teaching and research, personalized learning and so on [1]. Future learning will be personalized learning driven by big data, and big data is actively promoting the intelligent development of education. In China, the development and reform of higher vocational education are constantly advancing with the times, the educational system is constantly improving, and the educational achievements are beginning to show [2]. However, it is undeniable that there are some drawbacks in higher vocational education at this stage, especially the lack of enough attention to individualized learning of higher vocational students. Educational big data, as an important cornerstone of personalized learning research and practice, promotes the deepening of educational intelligence [3]. Online education can share all online resources without geographical restrictions, and online education is not limited by the number of students. Online education is not only a way of education, but also a means to improve the quality of education and achieve educational fairness. Based on big data technology, the recorded data are analyzed, and the potential rules are found, which can guide teachers' education and students' personalized learning [4]. The most essential difference between big data and traditional education data lies in the collection source and application.

Driven by big data, all aspects of education will be more or less affected by "big data". At the same time, the 21st century is the era of knowledge economy, which needs high-quality and diversified talents, and meeting the individualized needs of students has become the mainstream [5]. It is of great practical significance and application value to study the individualized learning of higher vocational students driven by big data, comprehensively understand the individual differences of higher vocational students based on the analysis of educational big data, adopt appropriate learning methods according to the characteristics of students' individualized learning, intelligently push individualized learning content, meet students' individualized learning needs, and innovate a new mode of talent cultivation in higher vocational colleges [6]. Online learning systems usually contain a lot of learning content, and it is often difficult for learners to find the learning path that best meets their own needs. This phenomenon reduces the personalized advantages of online

learning systems [7]. The research and practice of personalized learning in online education mainly focus on the construction of learning environment, the development of learning platform, the construction of learning resources and personalized recommendation [8]. The continuous deepening of the application of big data technology and artificial intelligence education has provided a strong data foundation and technical guarantee for the research of personalized learning service for the whole online learning process. This paper discusses the personalized and accurate recommendation strategy of higher vocational students' learning content driven by big data.

2. The connotation of personalized learning from the perspective of big data

2.1. Personalized learning based on learning situation

With the innovation of educational concept and the deepening of the application of information technology in education, the connotation of personalized learning is also developing. The emergence of online learning, especially with the deepening of educational practice of artificial intelligence technology empowerment, makes it possible to practice individualized learning with the concept of "teaching students in accordance with their aptitude". Accurately grasping the connotation of personalized learning is the foundation and key of building a personalized learning service system driven by big data. Personalized adaptive learning, which is driven by big data and based on learners' personalized differences, provides learners with personalized education and teaching services. Educators actively carry out data analysis and research, fully grasp students' learning ability and learning direction, so as to provide students with accurate, solid, scientific, efficient, precise and personalized education. With the development and progress of science and technology, it is possible to analyze and grasp students' academic behavior and thinking emotion, and form accurate big data.

It is difficult to carry out personalized learning according to students' knowledge level in the traditional large-class teaching scene. With the application of educational big data and artificial intelligence technology, by collecting, analyzing and processing the big data of learners' learning behaviors and learning processes, learners' knowledge learning ability can be accurately diagnosed, and according to the diagnosis results, personalized learning services oriented to the improvement of students' knowledge level can be provided. In the process of students' individualized learning, students' individual thinking habits and learning styles are important factors that affect their learning results. Teachers should grasp and analyze the relevant data of students' learning process in time, and master the whole process of students' learning, so as to truly understand each student's learning plan, learning ability, learning progress and specific learning results, etc. [9]. In the Internet age, with the popularization of IT industry, Internet of Things, Internet, social networks and technology tools, people's daily study, work, entertainment and life are virtually wrapped in data packets. The construction of data network has created a new learning mode, started to really pay attention to students' individualized and autonomous learning needs, and also reflected the development trend of students' personal and social reality, effectively realizing the value orientation of individualized and lifelong higher vocational education.

2.2. Flexible education system adapting to personality development

At present, the intelligent terminal equipment has a stronger situational awareness. Through intelligent terminal equipment, learners' situations and learning needs can be effectively perceived, and push services such as learning resources, learning companions and learning tools can be provided to learners. Personalized learning based on context awareness will become the mainstream learning method in the era of big data-driven artificial intelligence. The traditional learning resources are limited to textbooks, the content of which lacks innovation, and the update speed is slow, so it is difficult to meet the requirements of students' personalized learning. Therefore, the rich learning resources driven by big data can realize students' individualized and diversified learning requirements and stimulate learners' autonomy and creativity [10]. With the blessing of intelligent technology and equipment, it is very easy to capture, identify and analyze learners' personalized

learning needs, and dynamically adjust and push personalized services to meet learners' situational needs according to the changes of learning situations. Individualized learning at this level is a learning stage in which technology is fully empowered, and it is also a ubiquitous learning stage to meet learners' needs, timely and appropriate learning.

Learners' learning activities are endowed with intangible challenges. Learners not only need to know the data information, concentrate on the collation and analysis of the data information, but also need to constantly improve their ability and level of learning knowledge, and choose resources with high value level that are conducive to their own development. In the intelligent learning space, learners can set their own learning pace and pace, and the intelligent learning space can adapt to learners' learning rhythm. Learners can arrange their own learning contents and make their own learning plans, and there is no concept of taking classes. Learning is a natural need and lifestyle. Through scientific and efficient analysis of big data, educators can find out the shortcomings in personalized teaching in time, so as to make corresponding adjustments to their teaching plans, correct students' unscientific thinking habits and learning styles in time, and don't wait until the final examination results are unsatisfactory to be noticed.

3. Design of individualized learning mode

3.1. Strengthen the construction of data resource database

Driven by big data, the field of education presents a new development trend: education not only pays attention to the realization of learners' individual and social functions, but also pays attention to how to use modern educational technology to effectively realize learners' personalized and lifelong sustainable development. Because the digital teaching resources have the space-time characteristics that other resources can't match, students can use the online teaching platform to actively study at any time without the restriction of time and place. Under the big data environment, the online teaching platform provides students with rich and diverse digital teaching resources to support their personalized learning. Higher vocational colleges should strengthen the management of data resource database, which mainly involves data cleaning, data updating, analysis model and privacy issues. Data cleaning refers to the need to dynamically deal with the relationship between entities in the data source when data is extracted. The system structure of teaching resource database is shown in Figure 1.
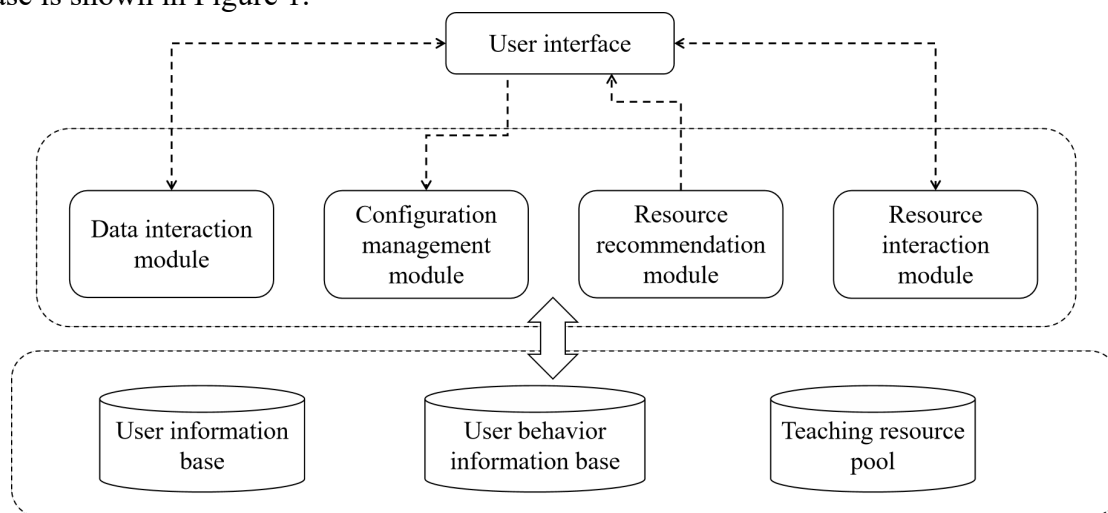

Figure 1 System structure of teaching resource pool

Data update mainly refers to the dynamic processing of data, reflecting the timeliness of data. In the personalized learning environment, because of the different foundations of students, two people who have the same learning may have completely different learning effects. Therefore, in order to realize students' individualized learning, it is necessary to identify the students' foundation, including knowledge, intelligence and ability. The construction of data resource database in higher vocational colleges not only needs the support of hard facilities of modern information technology

resources, but also needs the protection of soft facilities such as morality, personal cultivation and prevention mechanism. In view of the construction and management of data resource database, all kinds of influencing factors should be fully considered, so that the advantages of database can be fully reflected.

3.2. Strategies for improving learning

Education not only pays attention to the realization of learners' individual and social functions, but also how to use modern educational technology to effectively realize learners' personalized and lifelong sustainable development. The use of modern educational media technology has deeply influenced the traditional learning concept, and fully reflected the characteristics of respecting people's initiative, creativity and independence. Personalized learning has become an inevitable choice. Teachers need to update the knowledge and content of evaluation, create a student-centered evaluation atmosphere, choose diversified evaluation methods, and solicit the opinions of third-party evaluation subjects. Higher vocational students improve their learning strategies and promote their own personalized learning ability. Personalized learning fully embodies the educational philosophy of students' subjectivity, respect for personality development and lifelong development. Before starting personalized learning, students need to conduct self-examination under the guidance of teachers, and have a correct understanding of their cognitive foundation, so as to decide where to start learning, in what order, and to what extent. In this way, every student can learn actively and actively in a personalized learning environment, constantly improve their interest in learning and gain a sense of accomplishment, thus avoiding the phenomenon that students give up learning because of too much difficulty in learning. The personalized recommendation model of student learning resources based on big data analysis is shown in Figure 2.
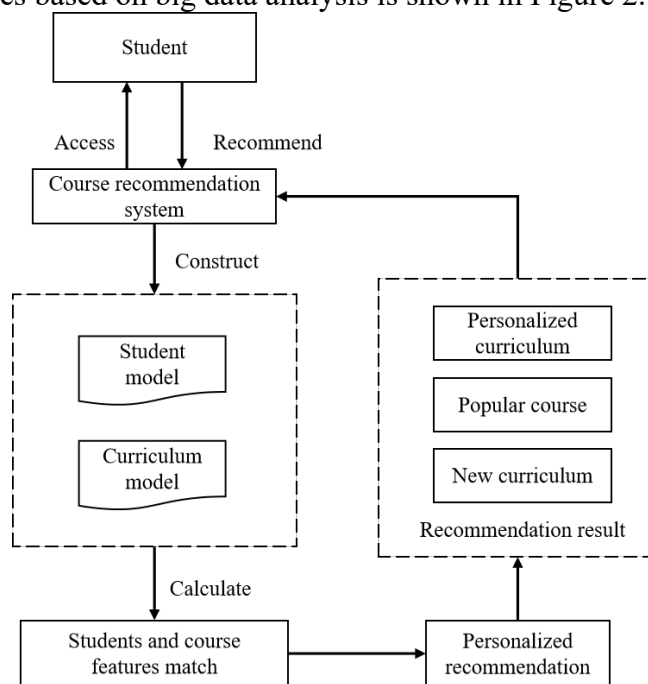

Figure 2 Personalized recommendation model of students' learning resources

Driven by big data, students should fully mobilize their enthusiasm, learn to make use of different excellent resources online and offline, constantly reflect and summarize in self-learning, actively use data resources to communicate with masters, learn from useful learning experience, learn to learn from others, bring forth new ideas, constantly update their own knowledge structure, and improve their self-learning ability. Teachers need to analyze each student's learning effect. For students with poor learning effect, they should discuss with students what causes the poor learning effect, what else needs to be improved in teaching methods, and how to build digital teaching resources is more reasonable, so as to effectively provide conditions for students' personalized learning.

4. Conclusions

Driven by big data, actively carrying out personalized adaptive learning can make the learning behavior reasonable, grasp students' learning situation, judge students' learning needs, and scientifically plan students' learning process. With the deepening of educational informatization and the increasing of online learning data, it is necessary to develop a personalized recommendation learning system, so as to accurately analyze learners' personalized needs from massive, sparse and noisy data. This paper studies the personalized learning based on big data at home and abroad from the theoretical and application levels, analyzes the characteristics of higher vocational students, builds a personalized learning model based on big data, and puts forward some suggestions for the implementation of personalized learning. The key to developing personalized learning services lies in accurately identifying learners' service needs and preferences in different learning situations, learning tasks and problem solving, and establishing an effective matching mechanism between learners' preference patterns and learning services. In the network age, students should fully mobilize their enthusiasm, learn to use different excellent resources online and offline, constantly reflect and summarize in self-study, actively use data resources to communicate with masters and others, and learn useful learning experiences.

References

[1] Gu Dongxiao, Li Xiaoyue, Xie Yi, et al. Grey case-based reasoning and personalized knowledge service method based on physical health big data [J]. Information Science, 2021, 39(12):6.

[2] Tang Yewei, Ru Lina, Fan Jiarong, et al. Research on individualized learning path planning based on learner portrait modeling [J]. Audio-visual Education Research, 2019, 40(10):8.

[3] Harper, Guo Bin, Hao Shaoyang, et al. A method of generating personalized dialogue content based on deep learning [J]. Journal of Graphic Science, 2020, 41(2):7.

[4] Xu Yanning. Design of personalized intelligent teaching system under the background of big data [J]. Modern Electronic Technology, 2020, 43(13):4.

[5] Wang Lili, Guo Weitong, Yang Hongwu. Using learner portraits to achieve personalized curriculum recommendation [J]. Audio-visual Education Research, 2021, 42(12):8.

[6] Cui Tianming, Liu Wei. Design of personalized online education system based on big data technology [J]. Modern Electronic Technology, 2021, 044(005):175-180.

[7] Ji Nanxun, Sun Xiaoyan, Li Zhenqi. Multi-source heterogeneous user-generated content fusion vector representation learning [J]. Computer Science, 2021, 48(10):8.

[8] Zhu Zhi. Research on personalized English teaching practice in colleges and universities under the background of big data [J]. Educational Theory and Practice, 2021, 41(30):3.

[9] Wang Mouzhijia, Li Yuting, Peng Xiaoling. Research on personalized evaluation modeling and tool design based on learning evaluation data [J]. Audio-visual Education Research, 2019, 40(8):10.

[10] Yang Lina, Wei Yonghong, Xiao Kexi, et al. Research on personalized learning service mechanism driven by educational big data [J]. Audio-visual Education Research, 2020, 41(9):7.