Research on Individualized Learning of Digital Course of Hotel Vocational Education Based on Big Data Analysis

Hua Zhong

Wuhan City Polytechnic, Wuhan, 430000, Hubei, China

Keywords: Big data analysis; Hotel vocational education; Digital courses; Individualized learning; Learning model

Abstract: This article focuses on how to realize individualized learning in the process of digital transformation of hotel vocational education. Through theoretical research methods, this article deeply analyzes big data analysis theory, hotel vocational education theory and individualized learning theory, and explores the integration path of big data analysis and individualized learning of hotel vocational education. Big data analysis has been applied in digital courses of hotel vocational education, but there are some problems such as narrow data collection range and limited analysis ability. Based on this, this article constructs a individualized learning model including learning data collection, analysis and processing, and individualized learning scheme generation. The model aims at meeting students' individualized learning needs and improving their professional ability, follows the principles of individuality, scientificity and dynamics, and provides students with accurate and exclusive learning support through closed-loop dynamic operation mechanism.

1. Introduction

In the era of rapid digital development, hotel vocational education is facing brand-new challenges and opportunities. With the wide application of information technology, the field of education is undergoing profound changes, and digital courses have become an important direction for the development of hotel vocational education [1]. At the same time, the educational concept has gradually changed from traditional unified teaching to individualized learning to meet the learning needs of different students and improve the quality of education [2]. In this context, the rise of big data analysis technology provides a new way and possibility for hotel vocational education digital courses to realize individualized learning.

Hotel vocational education aims to cultivate talents with professional skills and literacy in the hotel industry to meet the diversified needs of the industry [3]. In the past, the hotel vocational education curriculum adopted a unified teaching model, ignoring the differences among students [4]. Each student's learning foundation, learning style and learning goals are different, so unified teaching can't meet their individual development needs [5]. Although digital courses enrich teaching resources and forms, how to use these resources to realize individualized learning is still an urgent problem [6].

Big data analysis technology can collect, sort out and analyze massive educational data, and dig out the potential information in students' learning process [7]. By analyzing students' learning behavior, learning progress, learning preferences and other data, educators can deeply understand each student's learning characteristics, thus providing individualized learning support [8]. Applying big data analysis to digital courses of hotel vocational education will help to teach students in accordance with their aptitude, improve their learning enthusiasm and learning effect, and improve the quality and pertinence of hotel vocational education.

Based on the perspective of big data analysis, this study focuses on individualized learning of digital courses in hotel vocational education. The purpose of this study is to explore the integration mechanism of big data analysis and individualized learning through theoretical research, build a scientific and reasonable individualized learning model, and provide theoretical support and practical guidance for the development of hotel vocational education. By combing and analyzing relevant theories, it is expected to promote hotel vocational education to better meet the needs of

  DOI: 10.25236/icemeet.2025.027

industry development and cultivate more high-quality hotel talents with innovative and practical abilities.

2. Individualized learning theory

Individualized learning theory emphasizes respecting students' individual differences and is committed to providing each student with the most suitable learning environment and learning path. In the theory of individualized learning, students' subjective status has been fully valued. This theory advocates a student-centered teaching concept, and advocates designing teaching content and teaching methods according to students' unique needs and characteristics [9]. Individualized learning theory also emphasizes the autonomy of learning process. Encourage students to choose their own learning content, learning time and learning methods according to their own learning rhythm and goals. Students can give full play to their subjective initiative, actively explore knowledge, and cultivate the ability to think and solve problems independently. Individualized learning theory pays attention to the diversity of learning evaluation. No longer simply take the test scores as the only criterion to measure students' learning achievements, but comprehensively consider students' participation, progress, innovative thinking and other factors in the learning process. Through diversified evaluation methods, we can comprehensively and objectively reflect students' learning situation, provide students with more targeted learning feedback and promote their continuous progress.

3. The integration of big data analysis and individualized learning

In the field of hotel vocational education, the integration of big data analysis and individualized learning is gradually becoming the key path to improve the quality of education. This integration trend not only conforms to the development trend of educational modernization, but also effectively meets the needs of the hotel industry for diversified professionals.

Big data analysis has begun to be applied in hotel vocational education. In the current practice, some colleges and universities use big data technology to collect students' learning behavior data on the digital course platform, covering login time, course click frequency, homework completion and so on [10]. However, the application status is not perfect. On the one hand, the scope of data collection is still narrow, focusing on online behavior, and insufficient collection of performance data in offline practice. On the other hand, the ability of data analysis is limited, and most of them only stay at the simple level of data statistics, failing to deeply explore the potential value behind the data, and it is difficult to accurately guide individualized learning.

Big data analysis plays a vital supporting role in individualized learning of hotel vocational education. With the help of big data, educators can accurately understand students' learning needs. For example, by analyzing students' learning interest and participation in different hotel post-related courses, their career orientation is clarified, which provides a basis for subsequent individualized course recommendation. Big data can also help plan individualized learning paths. According to the students' knowledge, learning progress and ability level, we can customize the exclusive learning sequence to avoid students wasting time on content that is not suitable for them and ensure the efficiency of learning.

The integration of big data analysis and individualized learning of hotel vocational education is both feasible and necessary. From the feasibility point of view, the development of information technology has greatly reduced the cost of collecting, storing and analyzing big data, and colleges and universities have the hardware and software conditions to apply big data technology. Moreover, the ability to recognize and apply big data in the field of education has been continuously improved, providing a talent base for integration. As far as the necessity is concerned, the diversified development of the hotel industry needs diversified professionals, and the traditional unified teaching model cannot meet this demand. Only with the help of big data analysis to achieve individualized learning can we cultivate competitive hotel professionals who meet the actual needs of the industry and promote the high-quality development of hotel vocational education.

4. Construction of individualized learning model for digital courses

Under the background of big data era, it is of great significance to build a individualized learning model of digital courses of hotel vocational education based on big data analysis to improve the quality of hotel vocational education and meet students' individualized learning needs. The construction of this model needs to clarify the objectives and principles, and clearly define its constituent elements and operating mechanism.

(1) Objectives and principles of model construction

The purpose of the model construction is to provide accurate and individualized learning support for the learners of the digital course of hotel vocational education through big data analysis technology, and finally improve the learning effect and professional ability of students, so that they can better adapt to the post needs of the hotel industry. In the process of construction, follow the principles of individuality, scientificity and dynamics, as shown in Figure 1.

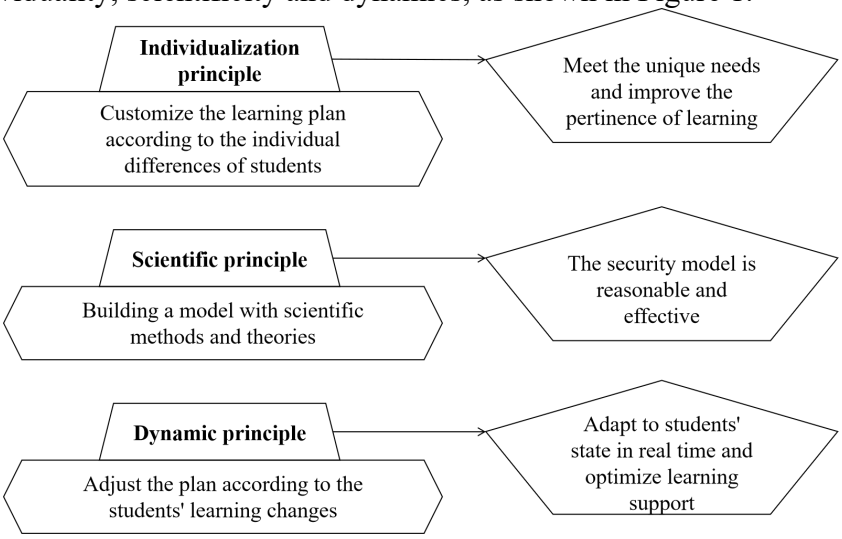

Figure 1 Model construction principles

(2) Elements of the model

The model is mainly composed of learning data acquisition module, data analysis and processing module and individualized learning scheme generation module.

The learning data acquisition module is responsible for comprehensively collecting all kinds of learning-related data of students. There are a wide range of data sources, including learning behavior data recorded by online learning platforms; Performance data in offline practice; And background data such as students' basic information and academic performance. The data collection contents are shown in Table 1.

Table 1 Data Collection Form for Students in Hotel Vocational Education

Data Category	Specific Content	Collection Purpose
Basic Information	Age, gender, previous educational background, family financial situation	Assist in analyzing students' learning foundations and characteristics
Online Learning	Course click frequency, video viewing duration, chapter test scores, assignment submission time and grades, forum participation	Evaluate online learning status and gain insights into learning preferences
Offline Practical Operations	Speed and quality of room tidying, standardization of dining table setting, customer reception and communication skills	Determine practical skill levels and identify strengths and weaknesses in practice
Academic Performance	Theory and practice course grades for each semester	Grasp overall academic achievements and lay the foundation for customized plans
Career Intentions	Intended hotel positions, areas of industry activities of interest	Clarify career development directions and match exclusive learning resources
Learning Preferences	Types of visual, auditory, or practical preferences	Select teaching methods according to preferences to improve learning efficiency

The data analysis and processing module uses professional data mining and analysis technology to deeply analyze the collected data. This module not only analyzes students' learning progress and

knowledge mastery, but also mines students' learning styles, interest preferences and other potential information. The individualized learning plan generation module makes a unique learning plan for each student according to the data analysis results. In view of the weak links of knowledge, it is recommended to strengthen learning resources; According to the learning style, choose appropriate teaching methods, such as providing more pictures and video materials for visual learners. Recommend related expansion courses and practical projects in combination with vocational interests to help students develop in the direction of their target careers.

(3) The operating mechanism of the model

When the model is running, the learning data collection module continuously collects students' learning data and transmits it to the data analysis and processing module in real time. This module processes and analyzes different types of data according to specific analysis methods, as shown in the following Table 2:

Table 2 Work Content Table for Data Analysis and Processing Modules

Data Category	Analysis Method	Analysis Purpose
Basic Information	Correlation analysis	Explore potential connections between students' backgrounds and learning performance
Online Learning Behaviors	Cluster analysis	Distinguish student groups with different learning patterns
Offline Practical Operations	Index scoring and comparative analysis	Evaluate practical skill levels and individual differences
Academic Performance	Trend analysis	Grasp trends in students' academic performance changes
Career Interest Tendencies	Word frequency analysis	Identify focal points of students' career interests
Learning Style Preferences	Classification and induction method	Determine students' dominant learning styles

The data analysis and processing module feeds back the analysis results to the individualized learning scheme generation module. Based on this, the individualized learning plan generation module generates or adjusts the students' individualized learning plan and pushes it to the students. At the same time, the new data generated by students in the process of implementing the learning plan will enter the learning data acquisition module again. In this way, a closed-loop dynamic operation mechanism is formed, which ensures that the learning plan always fits the students' learning state and needs, continuously optimizes the students' learning experience and effect, and helps the hotel vocational education to achieve individualized and high-quality development.

5. Conclusions

This article focuses on the individualized learning of digital courses in hotel vocational education based on big data analysis, and has achieved a series of valuable results. At the beginning of the study, the connotation of big data analysis, hotel vocational education and individualized learning theory was clarified. On this basis, this article discusses the current situation of the integration of big data analysis and individualized learning in hotel vocational education, and points out that although the application of big data in hotel vocational education has made progress, it still faces difficulties in data collection and analysis. Big data analysis plays an important role in supporting individualized learning in accurately understanding students' needs and planning learning paths, and the integration of the two has practical feasibility and development necessity. In order to solve the problem effectively, a individualized learning model based on big data analysis is constructed. The model includes learning data collection, analysis and processing and scheme generation modules, and each module has a clear division of labor and cooperates with each other. The learning data acquisition module widely collects students' multi-dimensional data to provide comprehensive materials for analysis; The data analysis and processing module deeply digs into the data value and gives insight into students' learning characteristics; The individualized learning plan generation

module tailors the learning plan for students according to the analysis results. At the same time, the model operates with a closed-loop dynamic mechanism to ensure that the learning plan can be adjusted in real time with the students' learning state.

This study provides a systematic and scientific theoretical framework and practical guidance for individualized learning of digital courses in hotel vocational education. In the future, with the continuous progress of big data technology, it is expected to further improve the model and expand its application depth and breadth in practical teaching.

Acknowledgements

The authors acknowledge the Wuhan Educational Science Planning Project Research on the Development of Curriculum System for Higher Vocational Hotel Major under the Digital Background (2021C170).

References

[1] Zhu Dequan, Tu Chaojuan. A New Healthy Ecology for the Digital Transformation of Vocational Undergraduate Education[J]. China Educational Technology, 2023, (01): 38-45. DOI: 10.3969/j.issn.1006-9860.2023.01.006.

[2] Tang Ling, Zhang Xiaohao. Construction of a Digital Teaching Resource Management Platform for College English in the Era of Big Data[J]. Information Science, 2022, 40(10): 131-136. DOI: 10.13833/j.issn.1007-7634.2022.10.017.

[3] Chen Wenpei, He Haoyi, Huang Yueying. Research on Data Governance in Higher Vocational Colleges from the Perspective of Digital Transformation[J]. Chinese Vocational and Technical Education, 2024, (10): 72-78.

[4] Liu Chang, Xiao Ran, Huang Juchen. The Holistic Logic of Digital Transformation in Vocational Education Governance[J]. Theory and Practice of Education, 2025, 45(21): 15-20.

[5] Lu Shangkun, Chen Ya, Wang Hongbin. Research on High-Quality Construction of Innovation and Entrepreneurship Teaching Materials in Vocational Education Under the Background of Educational Digitalization[J]. Education Exploration, 2025, (06): 41-44.

[6] Zhang Junqing, Chen Zhengzhen, Zhang Quan. Practical Dilemmas and Implementation Pathways of the Transformation and Development of Vocational Education in the Digital Era[J]. Education and Vocation, 2024, (04): 49-55. DOI: 10.13615/j.cnki.1004-3985.2024.04.008.

[7] Cheng Ping. The Driving Logic, Practical Dilemmas, and Practical Pathways of Digital Empowerment for Vocational Education Development[J]. Education and Vocation, 2025, (02): 48-53. DOI: 10.13615/j.cnki.1004-3985.2025.02.001.

[8] Zeng Haomiao, Zhang Xuemin, Ren Qilin, et al. Influencing Factors and Spatial Equilibrium of Vocational Education Resource Distribution[J]. Acta Geographica Sinica, 2022, 77(12): 3180-3193. DOI: 10.11821/dlxb202212015.

[9] Huang Huiting, Zhuang Rongxia, Zhao Zhiqun. Analysis of Teaching Philosophy in the Design of Vocational Education Professional Teaching Resource Banks[J]. China Higher Education Research, 2023, (09): 102-108. DOI: 10.16298/j.cnki.1004-3667.2023.09.17.

[10] Zhu Chunli. The Significance, Value, and Pathways of Constructing Vocational Education Professional Teaching Resource Banks[J]. Vocational and Technical Education Forum, 2020, 36(10): 58-62.