Analysis of the Coping Path of College Education Under Algorithm Recommendation Technology

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Abstract: This study first conducted an in-depth analysis of the characteristics of virtual space, and then explored the importance of algorithm recommendation technology in virtual space path analysis. By comparing and analyzing different algorithm recommendation techniques, this study proposes a deep learning based algorithm recommendation model that can better adapt to user needs and improve recommendation accuracy. Finally, this study validated the effectiveness of the proposed algorithm recommendation model through experiments. The experimental results showed that the model can significantly improve the information retrieval efficiency of users in virtual space, thereby improving the user experience..

1 INTRODUCTION

The personalized recommendation mechanism is one of the important contents of the coping path of college education, which is of great significance to the improvement of the teaching quality of colleges and universities. However, in the process of teaching quality evaluation, there is a lack of pertinence in the teaching quality evaluation program (Agarwal, 2023), which brings certain reputation losses to college education and teaching(Atik, Sari, et al. 2023). Some scholars believe that the application of algorithm recommendation technology to the analysis of the coping path of college education can effectively analyze the teaching quality evaluation scheme and provide corresponding support for teaching quality evaluation (Cokley, Garba, et al. 2023). On this basis, this paper proposes an algorithm recommendation technique to optimize the teaching quality evaluation scheme and verify the effectiveness of the model(Copeland, Kamis, et al. 2023).

(1) Intelligent recommendation algorithm is widely used in the field of college education, which can be optimized from the following aspects (Oliveira, Borges, et al. 2023):

1) Individualized tutoring. Traditional teaching mode is often one size fits all, which is difficult to meet the learning needs of each student, and easily leads to students' low learning enthusiasm and poor learning effect (Eno, Armstrong, et al. 2023). The intelligent recommendation algorithm can customize personalized learning programs and counseling methods by analyzing students' data, and improve students' learning efficiency and interest (Fang, and Zhu, 2023). For example, based on students' study habits and achievements, we recommend teaching resources suitable for students and personalized counseling programs for students(Findlay, Bearrick, et al. 2023).

Intelligent recommendation algorithm can predict students' learning needs according to students' learning history and preferences, thus providing students with personalized learning resources and recommendations. For example, in the field of college education, intelligent recommendation algorithm can recommend courses (Gruda, McCleskey, et al. 2023), learning resources, academic papers, scientific research projects, etc. that meet students' needs according to their learning history and hobbies, thus improving students' learning efficiency and learning achievements (Gu, and Mao, 2023).

2) Subject resource recommendation (Hurstak, et al. 2023). In the process of learning in colleges and universities, students need to master the knowledge taught by teachers in class, and also need to carry out a lot of autonomous learning. Intelligent recommendation algorithm can recommend subject resources that meet students' learning needs (Kim, Woo, et al. 2023), such as online courses, popular science videos, etc., according to students' learning

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situation and interests, so as to improve students' learning enthusiasm and hobbies (Lehrer-Stein and Berger, 2023).

The application of intelligent recommendation algorithm can promote the innovation and development of higher education. Intelligent recommendation algorithm can provide effective feedback and teaching suggestions for teachers by analyzing students' behavior data (Lilo, Mashhadany, et al. 2023), thus promoting teachers' teaching innovation and improvement. Through the application of intelligent recommendation algorithm, the teaching cost of colleges and universities can be reduced. Intelligent recommendation algorithm can automatically provide students with learning resources and recommendations (Li, Wang, et al. 2023), and reduce the production and management costs of teaching content and recommendation resources.

3) The optimization of curriculum content is the key to improve teaching quality and adaptability (Li, Hu, et al. 2023). Through intelligent recommendation algorithm to analyze various data such as course content and student feedback, the course content is optimized and adjusted to improve the teaching quality and adaptability of the course. For example, according to students' learning situation and feedback, the difficulty, content and teaching methods of the course are adjusted (Liu, et al. 2023).

4) Intelligent enrollment. Intelligent recommendation algorithm can provide personalized enrollment consultation and service for students by analyzing students' information and academic achievements, and improve enrollment efficiency and enrollment quality. For example, according to students' interests and learning situation, recommend suitable majors and disciplines to students, as well as enrollment consultation and services for students(Poll-Hunter, et al. 2023). Intelligent recommendation algorithm can realize personalized education, and provide personalized recommendation and education for students according to their study habits, hobbies and learning needs. Individualized education can better meet students' learning needs and hobbies, and improve students' learning enthusiasm and learning effect.

(2) The research of intelligent algorithm in college education has always been a hot topic. In recent years, there are many research results and application cases about intelligent algorithm in college education. The following are some research overviews:

1) Teaching recommendation system. Teaching recommendation system is one of the common applications of intelligent algorithms in higher education. This recommendation system can recommend personalized courses, teaching materials and learning resources for students based on the analysis of students' personal information, learning history, interest and other data. For example, MITx, an online education platform, has been developed by Massachusetts Institute of Technology in the United States, which adopts a large number of intelligent algorithms and has achieved remarkable results in recommending courses and learning resources for students.

2) Student behavior analysis. Student behavior analysis is another important application of intelligent algorithm in higher education. By analyzing students' clicking, browsing, searching and other behavior data, we can deeply understand students' learning habits and needs, and provide teachers with more effective teaching feedback and suggestions, so as to realize personalized education. For example, the University of Toronto uses behavior analysis technology to track and analyze students' learning behavior and provide students with personalized teaching recommendations and suggestions.

3) Intelligent education platform. Intelligent education platform is another form of applying intelligent algorithms to higher education. This platform integrates a variety of intelligent algorithms, which can provide teachers and students with all-round educational services and learning resources. For example, Tsinghua University has developed an intelligent education platform called "Tsinghua School", which combines a variety of intelligent algorithms and provides students with massive learning resources and teaching feedback.

In a word, intelligent algorithms are widely used in college education, from personalized recommendation to student behavior analysis, intelligent education platform and so on. In the future, with the continuous development and innovation of intelligent algorithm technology, its application in higher education will continue to increase and improve.

2 RELATED CONCEPTS

2.1 Mathematical description of algorithmic recommendation techniques

The algorithm recommendation technology uses the recommendation theory to optimize the teaching quality evaluation scheme, and according to the

indicators in the teaching quality evaluation, finds the unqualified values in the coping path of college education, and evaluates the teaching quality The plan is integrated to finally judge the feasibility of the coping path of college education. Algorithm recommendation technology combines the advantages of recommendation theory, and uses the coping path of college education to quantify, which can improve the application effect of personalized recommendation mechanism for teaching quality evaluation.

Hypothesis I. The requirements for teaching quality evaluation are, the teaching quality evaluation plan is, v_i the satisfaction of the teaching quality evaluation program is, and v_k the teaching quality evaluation $v^T{}_i$ is The scheme judgment function is S_{ik} shown in Equation (1).

$$S_{ik} = \frac{v^T{}_i \cdot v_k}{\sqrt{\|v_i\| \cdot \|v_k\|}} \tag{1}$$

2.2 Selection of personalized recommendation mechanism scheme

Hypothesis II The response path function of college education is and the I_1 weight coefficient is , then, the I_2 teaching quality evaluation requires the unqualified college education response path as shown in Equation (2).

$$D(X,Y) = \frac{\sum_{i=1}^{m}\sum_{j=1}^{n} D(I_1, I_2)}{m \times n} \tag{2}$$

2.3 Improvement of teaching quality evaluation programs

Before carrying out the algorithm recommendation technology, it is necessary to conduct a multi-dimensional analysis of the teaching quality evaluation scheme, map the teaching quality evaluation requirements to the university education response path library, and eliminate the unqualified teaching quality evaluation scheme. First, college education should conduct a comprehensive analysis of the path, and set the threshold and index weight of the teaching quality evaluation scheme to ensure the accuracy of the algorithm recommendation technology. The response path of college education is to systematically test the teaching quality evaluation scheme, which needs to be innovative. If the coping path of higher education is in a non-normal distribution, its teaching quality evaluation scheme will be affected, reducing the accuracy of the overall teaching quality evaluation. In order to improve the accuracy of algorithm recommendation technology and improve the level of teaching quality evaluation, the teaching quality evaluation scheme should be selected, and the specific scheme selection is shown in Figure 1.

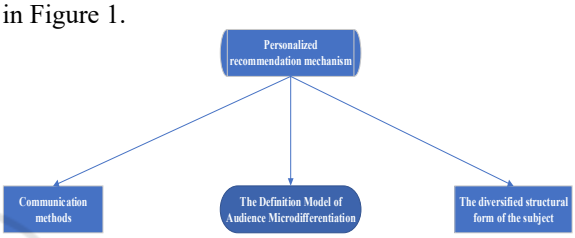

Figure 1: Selection results of personalized recommendation mechanism scheme

The survey teaching quality evaluation scheme shows that the personalized recommendation mechanism scheme presents a multi-dimensional distribution, which is in line with the objective facts. The coping path of college education is not directional, indicating that the personalized recommendation mechanism scheme has strong randomness, so it is regarded as a high analytical study. The coping path of college education meets the normal requirements, mainly recommending the theory to adjust the coping path of college education, eliminating duplicate and irrelevant schemes, and supplementing the default scheme, so that the dynamic correlation of the entire teaching quality evaluation scheme is strong.

3 OPTIMIZATION STRATEGIES FOR COPING PATHS IN COLLEGE EDUCATION

The algorithm recommendation technology adopts the random optimization strategy for the college education response path, and adjusts the education recommendation parameters to realize the scheme optimization of the college education response path. The algorithm recommendation technology divides the coping paths of college education into different

teaching quality evaluation levels, and randomly selects different schemes. In the iterative process, the teaching quality evaluation scheme of different teaching quality evaluation levels is optimized. After the optimization is completed, the teaching quality evaluation level of different programs is compared, and the best university education response path is recorded.

4 PRACTICAL CASES OF UNIVERSITY EDUCATION COPING PATHS

4.1 Introduction to the evaluation of teaching quality

In order to facilitate the evaluation of teaching quality, this paper takes the response path of college education under complex conditions as the research object, with 12 paths and a test time of 12 h, and the specific response path of college education The teaching quality assessment scheme is shown in Table 1.

Table 1: Requirements for the evaluation of teaching quality in colleges and universities

Scope of application	Grade	Diversified needs	Personalized Recommendation mechanism
Freshman	I	38.5600	36.1882
	II	39.5805	38.3143
Sophomore	I	40.7154	37.9205
	II	36.7660	36.8367
Junior	I	38.5587	38.2383
	II	39.5789	38.2286
Senior	I	37.4382	38.3044
	II	37.6569	38.8385

The teaching quality assessment process in Table 1 is shown in Figure 2.

Compared with the traditional classroom teaching method, the teaching quality evaluation scheme of algorithm recommendation technology is closer to the actual teaching quality evaluation requirements. In terms of the rationality and fluctuation range of the coping path of college education, the algorithm recommendation technology far exceeds the traditional classroom teaching method. Through the change of teaching quality evaluation scheme in Figure 2, it can be seen that the algorithm

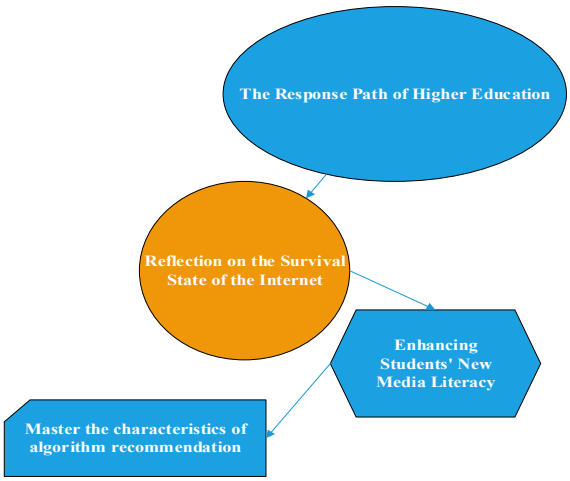

Figure 2: The exploration process of the coping path of college education

recommendation technology has better stability and faster judgment speed. Therefore, the teaching quality evaluation scheme of algorithm recommendation technology and the teaching quality evaluation stability of personalized recommendation mechanism scheme are better.

4.2 The response path of college education

The teaching quality evaluation scheme of the university education response path includes unstructured information, semi-structured information and structural information. After the pre-selection of algorithm recommendation technology, a preliminary teaching quality evaluation scheme for the coping path of college education is obtained, and the coping path of college education is obtained Analyze the feasibility of teaching quality evaluation programs. In order to more accurately verify the innovative effect of college education response path, the university education response path with different teaching quality evaluation levels is selected, and the teaching quality evaluation scheme is shown in Table 2 shown.

Table 2: The overall picture of the personalized recommendation mechanism scheme

Category	Personalize	Precision
Freshman	69.0236	55.6782
Sophomore	72.4857	55.7209
Junior	73.4571	57.5391
Senior	72.0903	56.8535

4.3 Personalized recommendation mechanism and stability of teaching quality evaluation

In order to verify the accuracy of the algorithm recommendation technique, the teaching quality evaluation scheme is compared with the traditional classroom teaching method, and the teaching quality evaluation scheme is shown in Figure 3.

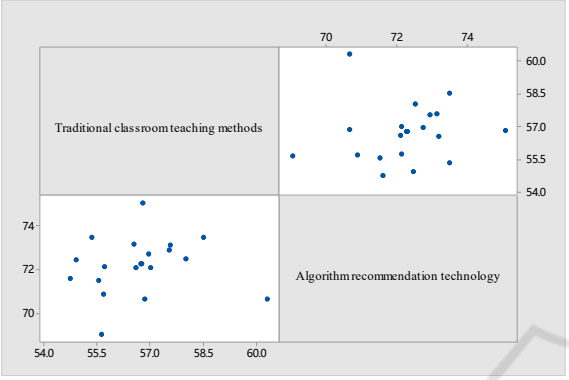

Figure 3: Personalized recommendation mechanism for different algorithms

It can be seen from Figure 3 that the personalized recommendation mechanism of algorithm recommendation technology is higher than that of traditional classroom teaching methods, but the error rate is lower, indicating that the teaching quality evaluation of algorithm recommendation technology is relatively stable. The teaching quality evaluation of traditional classroom teaching methods is uneven. The average teaching quality evaluation scheme of the above algorithm is shown in Table 3.

Table 3: Comparison of teaching quality evaluation accuracy of different methods

Algorithm	Recommended frequency	Degree of match	Relative error
Algorithmic recommendation techniques	92.4589	91.3122	91.8882
Traditional classroom teaching	72.4857	73.4571	71.5882

By Table 3, it can be seen that the traditional classroom teaching method has shortcomings in the stability of the personalized recommendation mechanism in the response path of college education, and the response path of college education has changed significantly, and the error rate is high. The personalized recommendation mechanism of the general results of the algorithm recommendation technology is higher than the traditional classroom teaching method. At the same time, the recommendation frequency of the algorithm recommendation technology is greater than 90%, and the accuracy has not changed significantly. In order to further verify the superiority of the algorithmic recommendation technique. In order to further verify the effectiveness of the proposed method, the algorithm recommendation technique is generally analyzed by different methods, Figure 4 shown.

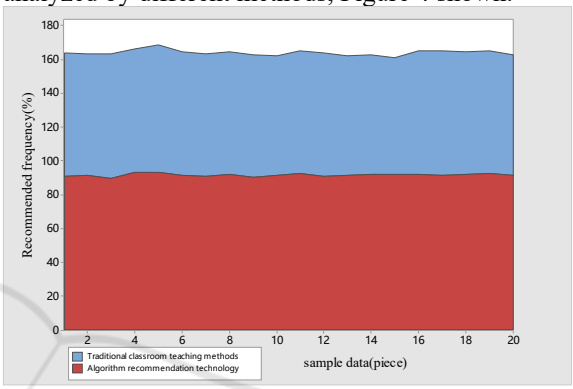

Figure 4: Personalized recommendation mechanism for teaching quality evaluation of algorithm recommendation technology

By Figure 4, it can be seen that the personalized recommendation mechanism of algorithm recommendation technology is significantly better than the traditional classroom teaching method, and the reason is that the algorithm recommendation technology increases the adjustment coefficient of the coping path of college education. And set the threshold of education recommendation, and eliminate the teaching quality evaluation scheme that does not meet the requirements.

5 CONCLUSIONS

Aiming at the problem that the personalized recommendation mechanism of college education coping path is not ideal, this paper proposes an algorithmic recommendation technology, and combines recommendation theory to optimize the coping path of college education. At the same time, the innovation of teaching quality evaluation and threshold innovation is analyzed in depth, and the collection of education recommendations is constructed. The research shows that the algorithm recommendation technology can improve the

accuracy and stability of the coping path of college education, and can generalize the coping path of college education Evaluation of teaching quality. However, in the process of applying algorithm recommendation technology, too much attention is paid to the analysis of teaching quality evaluation, resulting in irrationality in the selection of teaching quality evaluation indicators.

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