Construction of Interdiscipline Curriculum Resource Library Based on Artificial Intelligence

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ABSTRACT

In combination with the characteristics of artificial intelligence and separate subject course as well as the actual needs of teaching, this paper introduces the construction circumstance of the separate subject curriculum resource library based on artificial intelligence in respects of the construction of the separate subject curriculum resource library, the optimization of teaching resources and conditions, and analyzes the construction of the relevance resource database of the interdisciplinary resource library in detail. By making use of the concrete application of machine learning algorithms in data mining, establishes the machine learning module and the expert system module to simulate the knowledge and experience of the human experts, and the decision-making support is provided for the solution steps and ways of problems.¹

INTRODUCTION

With the advancement and deepening of the new curriculum reform in basic education, the construction of interdiscipline curriculum resource library has become an important means to realize the sharing of high quality education resources, which is also the inevitable outcome of modern education reform. Focusing on cultivating talents, optimizing teaching contents and innovating teaching methods for the construction of interdiscipline curriculum resource library, hence comprehensively advancing the construction of interdiscipline curriculum resource library in the

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scope of education area. The construction of shared interdiscipline curriculum resource library based on artificial intelligence is of important practical significance for narrowing the differences in educational quality between schools, achieving balanced development of regional education, developing shared high-quality teaching resources and accelerating the process of informatization and modernization of basic education[1].

RELEVANCE ANALYSIS OF INTERDISCIPLINE

Interdiscipline refers to the process of merging or integrating various disciplines which have internal relations with each other. It is an inevitable stage for the reform and development of education and teaching. However, interdiscipline teaching is different from general academic subjects teaching. Firstly, interdiscipline teaching takes constructivism as the theoretical connotation, and bases on knowledge reconstruction and the relevance between disciplines; secondly, interdiscipline learning depends on practice to realize the practical process of the internalization and externalization of knowledge and skills; finally, interdiscipline teaching aims at establishing meaningful and valuable linkages between two or more disciplines, integrating disciplines and developing courses, so that the results obtained are comprehensive. The interdiscipline curriculum resource library is constructed on the basis of interdiscipline teaching, using for serving the study of interdiscipline courses, and putting the knowledge of various disciplines into the resource library in order to maximize the role of interdiscipline teaching[2].

![Figure 1. The structure of interdiscipline curriculum resources library.](image-url)
MODEL CONSTRUCTION OF INTERDISCIPLINE CURRICULUM RESOURCE LIBRARY

Structure of Inter Discipline Curriculum Resource Library Based on Artificial Intelligence

The interdiscipline curriculum resource library mainly includes machine learning and expert system, integrating the artificial intelligence and data mining technology, and taking interdiscipline courses as the core elements in order to carry out the subject-specific teaching.

Machine Learning Module

The machine learning module of library improves the learning algorithm through optimizing the computer program in accordance with data experiences. At the same time, it adopts relevant modes to predict the relevant algorithm intelligently making use of the construction technology to enable learners to obtain good learning experiences[3]. The machine learning flow chart is shown in Figure 2. Data modeling cannot be accomplished directly through machine learning algorithm, it needs to restructure historical data through theoretical analysis, assuming that, and the historical data is x (t), t=1, 2, N, n represents original data, and x (t) is processed by embedded dimension m and time x, so:

\[
X (n+\tau) = \{x (n+\tau),..., x( +n\tau)} \]  \hspace{1cm} (1)

In accordance with F: \( \mathbb{R}^m \rightarrow \mathbb{R}^m \), the constructed historical track of data is:

\[
X(n+m\tau) = f(x(n),x(n+\tau),...,x(n+(m-1)\tau)) \]  \hspace{1cm} (2)

The f () in the formula represents the data verification function.

The data model integrates the characteristics of the stability of data mining, can predict the features of nonlinear data change and establish a high-precision data model to perform operation, hence improving the accuracy of data preprocessing.
Curriculum Expert System

The expert system module simulates the decision-making process of human experts by making use of the artificial intelligence technology and computer technology, in accordance with the knowledge and experience of experts provided by the system, carries out the processes of judging and reasoning[4]. The curriculum expert system working flow chart is shown in Figure 3.
In order to reduce the influences caused by data fluctuation, a relatively unified operation is implemented to the expert system on the basis of artificial intelligence technology in a certain scope, so that the change range of the data provided by the dynamic data to the inference engine is narrowed within the range of [0, 1], according to

\[ x' = \frac{x - X_{\text{min}}}{X_{\text{max}} - X_{\text{min}}} \]  

(3)

In the formula, \( x \) represents the data of the knowledge and experience of experts; \( X_{\text{max}}, X_{\text{min}} \) represent the maximum and minimum of the dynamic data provided respectively, and \( x' \) represents the unified knowledge data.

Through the decision-making analysis of the expert system, it can solve the steps of diagnosis, analysis, explaining and guidance in the course of education and learning. In order to build a diversified intelligent learning system of separate subject curriculum resource library based on artificial intelligence, and provide learning resources sources based on information technology for students.

APPLICATION

The data sources of interdiscipline curriculum resource database include professional teaching resources and public information resources. The construction process of the interdiscipline curriculum resource library of computer engineering should be centered on the major, computer engineering major, and combine the courses of the various directions of the major, establish a relatively comprehensive resource system. Through technology and management innovation, the database which has supporting resources including course design, teaching standards, training of exercises, professional standards, enterprise cases, evaluation and examine, teaching presentation, simulation practical training projects, talents cultivation programs, etc., has formed in three levels of major, curriculum and material, it will integrate the current resources systematically, and complete the interdiscipline knowledge reorganization and resource application of computer engineering, generate a rapid access to the content of the curriculum, hence realizing rapidly visit high-quality education resources, and improving the overall teaching efficiency as well as meeting the needs of personalized learning[5].

CONCLUSIONS

The construction of interdiscipline curriculum resource library based on artificial intelligence, consists of interdiscipline relevance, current conditions of interdiscipline resource library, existing problems and the solutions, machine learning and course expert system, adopting the data taping technology in
machine learning algorithms to facilitate improving the accuracy and speed of the problem solving, and simultaneously implementing the rational improvement of knowledge database in a continuously manner, hence practically giving full play to the favorable aspects in the problem solving, and applying it to various areas of education and teaching.

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