

Original Research Article

Research on the realization of intelligent computer in assistant teaching

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Abstract: The combination of artificial intelligence and computer-aided instruction (CAI) makes up for the original shortage and also improves the teaching quality of teachers and the learning efficiency of students. Based on the characteristics of the intelligent computer-aided instruction system, this paper analyzes the realization principle of the system, hoping to be helpful.

Keywords: Intelligent computer; assistant teaching; realization principle

At present, the computer has entered the classroom, becoming a resource in the classroom teaching. With the effective application of AI technology in computer-aided instruction system, not only the teaching contents are further clarified, but also the individualized teaching which is more suitable can be adopted after the comprehensive understanding of what to teach, who to teach and how to teach, *etc.*, which is also known as an intelligent computer-assisted instruction system. It pays more attention to the application of cognitive theory and AI technology, it is the innovative development of computer technology, and further optimizes the teaching methods and related teaching ideas.

1. Characteristics of intelligent computer-aided instruction system

1.1 Representation and access to knowledge

The knowledge of artificial intelligence is to persist in taking psychology, logic and philosophy as the method guidance, which is to take knowledge as the object and regard the computer's software and hardware, science and technology, artificial intelligence and expert system technology as a tool. Under such conditions, knowledge becomes a "knowledge base" while the computer becomes more intelligent by simulating human experts and human intelligence, which improves the efficiency and accuracy of knowledge processing. This is not only for data information, but also for the intelligent processing of related knowledge. The concrete content is the formal representation, automatic reasoning and intelligent creation of knowledge, and computer-aided education is only one of them.

1.2 Symbolic computation

Symbolic computation refers specifically to the numerical value, the symbolic computation process, as well as the function drawing and so on.

1.3 Automatic diagnosis

The computer-aided education system can diagnose students' learning status automatically, find out the mistakes

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along with the root of the mistakes, and give scientific guidance. The system can also provide teaching content, teaching progress and teaching methods according to students' own characteristics.

1.4 Intelligent hypermedia teaching system

The teaching environment constructed by the hypermedia system can fully stimulate the students' interest in the teaching content, but the final learning effect can't be ensured, or even it may provide the teaching content when it does not know the teaching object, not to mention to be possible to teach students according to their aptitude. In order to perfect this deficiency, the intelligent assistant teaching system is developed by combining with the hypermedia system.

2. Realization principle of intelligent computer in assistant teaching

2.1 Module framework

The modular framework of the intelligent hypermedia teaching system is shown in **Figure 1**.

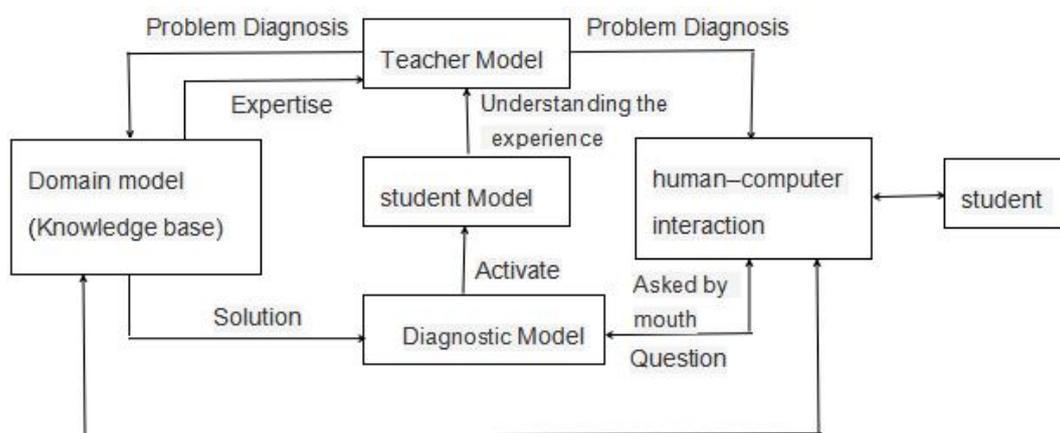


Figure 1. Block diagram of intelligent hypermedia teaching system

(1) The domain model is to store the knowledge imparted to the students in the classroom, then generate the questions, and provide the pertinent answer process and answer for the questions. The domain model mainly includes the classroom content, as well as the related knowledge that solves the question based on this kind of knowledge, which is also called the process knowledge. The representation of knowledge includes semantic network, rules and so on. Among them, semantic network aims at propositional semantic network and data semantic network.

(2) Diagnostic model. It is a diagnostic rule to analyze students' situation, judge students' existing knowledge or wrong concept, and transfer to students' model state.

(3) Student model. This model can accurately reflect students' learning ability and knowledge reserve, and can be used as an important basis for individualized teaching system. The student model based on cognitive theory is the key technology of intelligent hypermedia teaching system.

(4) Teacher model. The teaching strategy and the knowledge of the curriculum structure are used as the basis for students to select questions, and the students can make brief answers, supervision and evaluation, and provide targeted remedial materials. The intersection of teacher model, explanation model and student model make up the individual-oriented interactive teaching method. The teacher model mainly uses the diagnosis method, the correction method, the coach method teaching strategy. Intelligent hypermedia teaching system uses error correction and diagnosis to guide students' conceptual errors.

(5) Human-computer interaction. It is a medium for students to exchange information through the system, and stipulates that the system needs to provide students with familiar and usable means of expressing knowledge and information. By means of natural language and graphics, the students can complete the man-machine dialogue in the system, which enhances the intuitiveness and vividness of the communication.

2.2 Core technology: a cognitive student model

There are two main ways to build a student model.

(1) Cover model is a student model that shows what students know. It describes the knowledge with the subset of the professional knowledge under the domain module, and states the wrong content of the students' existing knowledge and the corresponding guiding opinions.

(2) Deviation model is a kind of student model which makes clear that the content of students' knowledge is wrong or correct. It treats knowledge with the deviation of professional knowledge, and finds out that the cause of students' errors is incorrect knowledge.

In the model of intelligent hypermedia teaching system, the student model emphasizes the personal information that learners fill in when they log in, including name, student number, sex, *etc.* It is also an important basis for acquiring students' knowledge reserves and learning ability in the intelligent teaching process. The intelligent hypermedia teaching system makes full use of the cognitive content. The coverage model and the deviation model are only aimed at the students' learning ability. They can't accurately indicate learners' cognitive ability and specific cognitive level, but it's also what teachers need to know the most. In the process of learning, students need to identify their own deficiencies, specific to the ability to remember, understanding or application. Only when teachers have a comprehensive understanding of students' cognitive ability can they adopt the most appropriate teaching methods and correct students' learning behavior and wrong knowledge in time.

The cognitive student model takes each concept node in each test unit as a cognitive type, and reflects the difficulty of teaching content, which can predict the cognitive ability of students. After the students have completed the test of each unit's concept and question type, the intelligent computer-aided instruction system will correct the students' cognitive ability in time from the specific right and wrong scores, and deduce the corresponding concept from the reasoning machine on the basis of this in order to carry out further teaching tasks.

The generation of teaching content and teaching method is the inference process of inference machine according to certain rules, which takes students' level as the basis of inference, operates this process repeatedly and perfects students' cognitive ability through constant revision.

2.3 Notable features of the system

The remarkable characteristics of the application of intelligent hypermedia teaching system in teaching work are as follows: first, the design work is carried out from cognitive theory, and the teaching courseware shows adaptability; second, it has strongly stimulated students to enter a more active and efficient learning environment. Third, it is conducive to the widespread application of individualized education. Fourthly, it has further improved the quality of teaching and learning.

3. Conclusion

Intelligent hypermedia teaching system started late in China, but it has shown a good market prospect, which can promote the system to upgrade and optimize further. The overall development of computer information technology, AI technology and pedagogy has deepened people's understanding of the intelligent hypermedia teaching system, and the system is studied in depth from a more comprehensive perspective. It lays a foundation for the sustainable development of auxiliary teaching and expands the application scope of the system in modern education.

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