The Design and Implementation of the Computer Intelligent Teaching System based on ITS Technology

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Abstract: At present, the development of computer aided instruction (CAI) courseware in our country is mostly some traditional linear and branching courseware. It adopts fixed structure mode, traditional programming method and realizes the development of courseware content through teaching. Teachers and staff should make arrangements beforehand, and teaching order should be designed according to the teaching plan formulated by the designer and students' rules. This teacher-led teaching mode is no longer suitable for our teaching. The effective way to solve this problem is to introduce AI technology into CAI. AI, especially expert system technology, is especially suitable for intelligent teaching system. It requires a lot of knowledge and experience from human experts. Although there are many intelligent tutoring systems, they still cannot meet the needs of teaching, because it is difficult for teachers to master programming technology, teaching experience cannot be reflected in the design, and computer professionals often lack teaching experience. In practical teaching, there are difficulties in the design of educational theories and methods. In the design part, this paper proposes a domain knowledge representation method, which gives object-oriented hypertext cognitive knowledge, and proposes a reasoning machine teaching strategy based on WEIG. According to the theory of cognitive learning, a step-by-step approximation method of learning students' cognitive and historical inheritance model is designed, and an automatic navigation and hypertext navigation teaching mode based on students' learning process is designed. Model and knowledge, the design explanation mechanism and man-machine interface of intelligent system are discussed. In the implementation part, the realization of the writing environment and the man-machine interface, the organization and management of knowledge are discussed, and the specific realization of the code reasoning is given. Finally, a preliminary implementation of the intelligent teaching system model is attempted. The development prospect of the system is prospected.

1. Introduction

I have engaged in the process of computer basic education in the past ten years, although like "computer foundation", "VISUALFOXPRO program design", "VISUALBASIC programming" courses for professionals, is not worth mentioning, but for normal college students especially the students learn the classes. It is not a very easy thing, such as "computer foundation", though, and than the other two door program design is relatively simple, but the two part of the concept of the basic knowledge and the network multimedia technology, the new understanding is more abstract, WORD and EXCEL while focusing on practice, but still cannot do without the traditional way of examination, students often feel before the examination of heart, a blank, the review is unable to proceed. How to change this state of the students, this matter has been bothering me. To strengthen the practice of students, students will consciously to do, even if the students consciously do homework, for teachers, can take more time to change the job, even if the change, the effect and how can it be imagined. Intelligent tutoring system in this regard to stand out. Over the years, many excellent teachers in difficult to grasp programming technology and cannot be valuable teaching should be reflected in the design of courseware; and programming highly skilled computer professionals often lack experience in teaching practice, it is difficult to in the program design

reflected education theory and method. Therefore introduced most of the courseware belongs to traditional teaching courseware, it for different students, the effect is stereotyped, unable to realize individualized teaching, even intelligent courseware and its intelligent effect is not particularly high, most of the low efficiency, and difficult to make teaching design and program design with the tacit understanding[1]. I think, as a computer educator, should have the advantage of these two aspects, this is my design of the original intention of the system. And more important is that due to the different application fields of intelligent teaching system, Professor of the content and object of different. Therefore, according to the specific teaching environment by specific intelligent algorithm or model to design a adapt to student's intelligent teaching system becomes more necessary. According to the teaching experience, I put the students into two groups: a class is a new (did not study computer courses), one is old school computer curriculum). For these two types of students, my teaching method is: the former requires controlled learning, which can choose their own learning, implementation of the "teaching" and "learning" the double main teaching mode, the system self breaking can be always around this model and design.

2. Introduction of related technologies

In the new century education and teaching means is to information technology as the main line, embodiment of multidisciplinary, multi-level development new technology. It uses human robot interaction and symbiosis is a brand new concept, make humans extended their ability, promote the college teaching reform (Figure 1).The traditional teaching mode based on the "teacher" is an auxiliary condition which is based on the theory of "stimulus response" learning and teaching theory.ITS is mainly based on the MOOCS of online teaching, this teaching method is called mixed teaching,Which in network sharing platform, will be a large number of outstanding Mu class share, help in improving the quality of the classroom to ensure the teaching effect and the type of online teaching and support learning mass participation and learning.And make the students become the center of teaching activities, pay more attention to students' active participation and self experience, and play the initiative of learning.At the same time, this kind of teaching mode uses the method of the combination of the on-line teaching and the physical classroom teaching.it can give full play to the advantages of two kinds of teaching mode, make up for the deficiency of traditional single classroom teaching,and the use of ITS Technology Can be teachers do not have to repeat the course of teaching content, you can put the main focus on guiding students to explore and answer questions.Not only reduces the burden of teachers, but also helps to improve the students' thinking and innovative ability.
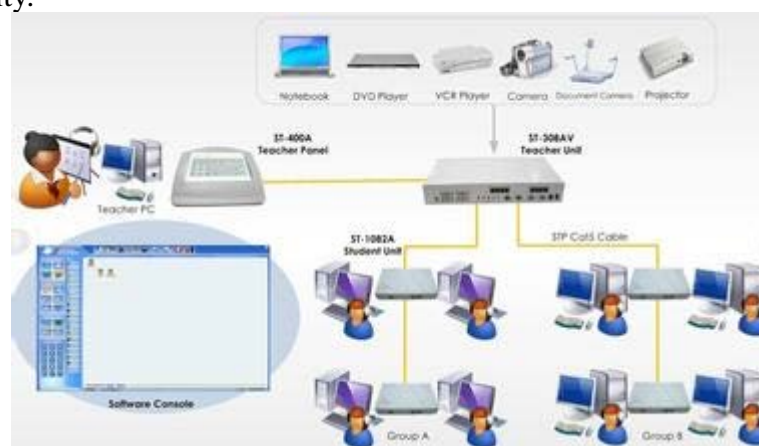

Figure 1. Schematic diagram of intelligent teaching system

2.1 Introduction of ITS model

At present more popular is based on Constructivism to "students" as the center of the teaching model. Its main idea is: "with students as the center, in the whole process of teaching and learning by teachers from organizers, guidance, help and facilitator role, take advantage of the situation,

collaboration, conversation and other elements of the learning environment to give full play to students' initiative, enthusiasm and initiative, and ultimately achieve to enable students to construct current knowledge of the purpose of effectively. In the traditional teaching mode, the four elements of the role and status and the traditional mode of teaching composition compared to the corresponding change, the students are no longer passive recipients of knowledge teaching, and become the active construction of teachers, the teaching process control change for the organizers of the teaching process, guidance, students construct the helper and promoter: knowledge teaching is no longer teachers to teach, and students take the initiative to construct the object becomes; media teaching is teachers to help complete teaching task tool change in order to help the students to take the initiative to learn learning, active exploration of knowledge tools. This new teaching model for learners provides more expansive learning environment, so that they can give full play to their creativity, imagination and the spirit of exploration, learning is no longer a passive, boring behavior, and become independent and full of fun[3].

Figure 2. Schematic diagram of ITS system

2.2 Intelligent teaching model

Requirements of teaching efficiency. While emphasizing the teaching effect, how to make learners master more teaching content in a limited time is also the goal of teachers and students. For some concepts and axioms of knowledge by teachers to explain the way passed directly to students, then use some examples cited show a deeper understanding may only need a short time, and achieve the teaching effect and the students' autonomous learning content is the same; and for some of the higher cognitive level, the computer direct indoctrination is not feasible, because this part of knowledge requires students to give full play to their initiative, to learn the knowledge and its knowledge system together, can be used for knowledge understanding. Therefore, the system can implement different teaching methods for different teaching contents. Different teaching objectives. Different teaching methods should be adopted for different teaching objectives. For the teaching content, the teaching method can make the students meet the requirements by using the computer directly, and do not have to ask them to build their own. For students need to understand the contents of the master, it is necessary for students to build around this theme, so that the construction of the hook is a meaningful construction, and the system needs to be consistent with the teaching [4].

3. System design and Implementation

ITS system mainly in knowledge representation, reasoning methods and natural language understanding of the use of three aspects of artificial intelligence theory. Knowledge representation is used to establish its curriculum knowledge base; reasoning strategy to answer their questions, assessment of a student's work, which is mainly on the knowledge in the knowledge base reasoning, draw the conclusion; natural language understanding makes teaching system allowing students to use natural language dialogue with the computer. Moreover, the computer also decided to when and

in what ways students to provide the necessary feedback information. Among them, knowledge representation and reasoning is the core of the development of ITS. Before the process of knowledge acquisition, knowledge engineers need in modeling the problem domain to select one or more experts in the field, even more subject experts, to ask the way of learning and domain related knowledge, access to problems in the field of basic concepts. Overview of the problem domain, by the experts exchange modeling problems in the field of views, including Dai Jianmo problem areas is expected the opinions of the expert system is proposed to solve the problem, determine the experts involved in the system development of collaboration, cooperation experts to identify, knowledge engineers with experts to work closely with formulated the design goal of the expert system, including knowledge of how to determine the source. Knowledge sources include experts in the past to solve the problem of examples, textbooks, as well as implicit in the expert's mind to solve the problem solving experience. The depth, breadth and effectiveness of knowledge in an expert system are closely related to the choice of experts[5].

The main function of the teaching model is according to the contents of the student model and knowledge base to make intelligent decisions and complete the intelligent navigation; timely collection of student responses, to process and analyze, judge the student achievement; to help students to analyze the reason of error, judge and mark the students most in need of learning knowledge; to provide individual counseling and appropriate supplementary materials. The teaching model is a typical double subject teaching model, choose different teaching methods for different students, for scholars, the first adaptive test, to explore students' ability and get the ability of students to the initial value, and constantly modify the ability of the students; for beginners to suggest the following system learning while doing exercises can also be free to choose knowledge points.

4. Conclusion

Application of expert system is mainly studied in this thesis in the intelligent tutoring system, from two aspects of the theoretical basis and teaching mode, the main intelligent teaching system of the intelligent teaching system is built, which provides a great convenience for the design and implementation of the computer basic course,And provides a collaborative environment for other courses,It is proved that Mu class is an efficient way to learn.Learners can use their own choice of tools to participate in learning, and use MOODLE to participate in online forums, blog articles, published in second life, and to participate in synchronous online meetings and so on.But compared to other computer systems, its development cycle may be longer, it involves the relevant content than other computers are also more complex.Therefore, this system is only in the knowledge representation, reasoning mechanism, student model, teacher model these aspects have made a more detailed study, other aspects of the need to change the import.

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