

Optimization and Integration Analysis of Computer Specialty Curriculum System Based on Simulation Technology

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Abstract: According to the characteristics of boring, abstract and difficult to understand, limited experiments and other characteristics of computer professional courses, and according to the research status of computer simulation technology in teaching, this paper first gives the construction ideas and assumptions of computer professional courses teaching system based on simulation technology, as well as the construction elements and strategies of the teaching system, and then carries out the implementation of the teaching system for computer professional courses. After an experiment in the teaching stage and according to the students' acceptance, a practical teaching system of computer specialty based on NS simulation technology was finally formed.

1. Research Background of Applying Computer Simulation Technology in Teaching

Research Status Abroad: In 1960s, the concept of simulation technology was put forward. In 1961, G. W. Morgenhtler gave the first technical explanation to the word simulation, which provided the basic concept and motivation for the later research on simulation technology. The University of Washington and Westinghouse Science Foundation launched the first mobile teaching program in 1994, driving a mobile teaching vehicle equipped with computer 3D virtual equipment in Washington to provide services for primary and secondary school students to receive 3D animation virtual teaching. The adoption of this teaching system can make the teaching process more intuitive and visualized and improve the students' ability to participate in teaching. At present, simulation teaching has been widely used in foreign military and accounting courses to build a simulation training curriculum system suitable for different objects. The application of this simulation technology in teaching started early and achieved good results, which is worth learning.

Current research situation in China: At present, simulation technology is concentrated in the fields of electronics and electronics and numerical control design, mainly applied to high-end design and major projects. Although good results have been achieved, the software and program developed by this simulation technology are very complex and not suitable for teaching. This kind of application is carried out in laboratory and virtual environment. For example, Zhejiang University has already applied it to the teaching of architectural engineering, using it for virtual planning and virtual design. The application of this kind of simulation technology has higher theoretical requirements for students and is not suitable for university teaching. This kind of teaching is based on simple technical application. Tianjin Zhongde Middle School adopts simulation technology in equipment fault diagnosis teaching based on virtual instrument in specific teaching practice. This kind of teaching focuses on students' specific operation of virtual instruments unilaterally and lacks guidance for students to learn theoretical knowledge.

College education must properly handle the relationship between academic education and vocational education, and better meet the requirements of higher education popularization, must be based on the application of talents to cultivate social needs. In combination with the development of the times, the teaching of computer courses must meet the conditions for the cultivation of applied talents in the new era. The cultivation of applied talents focuses on the efficient management and application of knowledge. This requires that the key work that should be done at present is the application of computer courses. As a compulsory course for computer major, computer major breaks through the existing teaching system of computer major courses. Through the use of simulation technology to achieve better teaching results, thus accelerating the evolution of computer

professional courses from learning to using. Computer network is a professional basic course with strong application. It is very urgent and necessary to reform the teaching system of computer professional courses in colleges and universities and to study the concepts and strategies of innovative and efficient teaching.

2. Construction of Teaching System for Computer Major Courses Based on Simulation Technology

Research ideas: Starting from the actual needs of colleges and universities, combined with investigation and analysis of the current teaching situation of computer major courses. Starting from the demonstration and examples of computer professional course teaching, this paper puts forward the main elements and promotion strategies of teaching based on simulation technology. Then a set of complete, feasible and suitable reform strategies for the teaching system of computer specialty courses are formed.

Research Assumption: Computer Foundation of College Students. Due to lack of knowledge, traditional teaching methods obviously cannot meet the current teaching requirements. According to the investigation, the students are not satisfied with the current teaching methods of computer courses, and the reform of computer courses teaching is imperative. Based on the above two reasons, this paper puts forward the hypothesis of reforming the teaching methods of computer courses: 1) the relationship between “simulation” teaching of computer courses and the acceptability of students; 2) the relationship between “simulation” teaching and students' interest in computer courses; 3) the relationship between “simulation” teaching of computer courses and students' independent learning; 4) The relationship between the “simulation” teaching of computer courses and the support of universities for this kind of teaching reform.

The Construction of the Teaching System

1) According to the students' acceptance ability and the training goal of the course, choose the simulation technology with better effect. NS (Network Simulator) originated from the REAL network simulator developed by the University of California at Berkeley in 1989. REAL can provide a better environment for network protocol machine algorithms and make it easier to simulate various network harmony architectures.

2) The main teaching elements and teaching strategies of the application of simulation technology in computer professional courses.

① Teaching elements. According to the good communication process between teachers and students in classroom teaching and experimental teaching, this paper puts forward three major elements in the teaching process: teachers, students and teaching resources.

② Teaching strategies. Three strategies for classroom teaching. A “case-based” teaching strategy of theory-simulation: teachers simulate some abstract concepts into multimedia information to enable students to quickly understand concepts. B. problems-the “inquiry” teaching strategy discussed: teachers provide problems and then actively guide students to think independently and ask questions. And to extend and expand the knowledge, we need to play the main role of students in teaching and create an equal teaching space. C. topic-research “research” teaching strategy: teachers set up a difficult active research topic to guide students to conduct autonomous inquiry learning. Three strategies for experimental teaching. A “circular” teaching strategy of simulation-practical operation: teachers' teaching and students' learning are completed in the circular process of simulation deduction-practical operation-finding problems-re-deduction of simulation. B fault-analysis “discovery” teaching strategy: students can learn from faults, which is a learning method to cultivate students' research ability and complete knowledge discovery. C “heuristic” teaching system of self-study and guidance: it is a mode in which students learn independently under the guidance of teachers. According to the three major elements proposed in the teaching process, the proposed teaching strategy is used to carry out teaching and arouse students' interest and enthusiasm in learning. In addition, the simulation technology NS is effectively combined to obtain the best teaching effect, thus forming the simulation teaching mode that is most suitable for the computer specialty courses of universities in the region.

3. Implementation of Teaching Model System for Computer Major Courses Based on Simulation Technology

According to the differences among students, majors and schools, combined with the characteristics of abstract and difficult to understand and strong practicality of the computer major courses, and according to the training objectives of the computer major courses, the abilities of students at all levels and the different requirements of different majors on the teaching objectives of the computer major courses, the simulation teaching mode of the course is implemented by using simulation technology and combining the elements and strategies of the teaching system proposed above.

The implementation of classroom teaching: There are many concepts designed in the teaching of computer major. When carrying out specific teaching, students generally reflect that the working principle of network architecture and protocols at various levels is difficult to master. Using multimedia courseware in time, students still feel that the teaching work is very empty and it is difficult to fully grasp the knowledge. When carrying out carrier monitoring multiple access/collision detection teaching in practical teaching work, although multimedia teaching technology can be used for demonstration, after the end of the course, the students expressed that they can understand the collision detection and back-off strategy, but the students' understanding of what impact this technology will have on the whole LAN is not very clear. If NS is used to simulate the actual network in teaching, it will not only make teaching more vivid and vivid, but also greatly improve students' understanding of learning knowledge and their ability to analyze and solve practical problems by using the learned knowledge. For example, various improved TCP versions of protocols are provided in NS, including slow TCP startup, congestion avoidance, fast retransmission and fast reply mechanisms. In the classroom teaching process, students can watch the sending process of data messages and ACK messages by using NAM, so that they can watch the animation window, and at the same time they can know the current database message and ACK message serial number, window size, queue length and other information through the monitoring window. In teaching, teachers can analyze the simulation results and compare different versions of the protocol in the form of icons so that students can better understand the working principle of the protocol.

The implementation of experimental teaching: it is far from enough to rely on classroom teaching only for the teaching of computer major courses, so the laboratory teaching work is taken as a supplement. According to the nature and teaching requirements of computer major courses, the main experimental courses include network cable production, local area network construction and professional operating system configuration. These experiments will be limited by the experimental conditions. Therefore, in the specific experiment, some simulation experiments can be arranged in the experiment. On the one hand, it can effectively make up for the lack of teaching experiment conditions, on the other hand, it can make students verify the theoretical knowledge learned through the experiment.

The steps of experiment teaching generally include experiment preparation, experiment content arrangement, experiment process, experiment result analysis and experiment report. In the experiment teaching, because of the choice of NS and the different characteristics of different students, teachers must make full preparation for the experiment in advance. The NS module, related protocol parameters and experimental steps involved in the experiment need to be reflected in the experimental instructions in detail. In the experiment, according to the different situations of different students, students can be guided to install ns on their experimental equipment, which can facilitate students to carry out experiments in extracurricular. When arranging the experimental content, students can be guided to use ns to build a network simulation platform, intuitively understand the behavior of each protocol, and insight into its working mode. By changing the protocol parameters, students can realize the different effects of different factors on the network.

For example, in teaching, when the network interconnection course is completed, teachers can guide students to establish a network based on NS, and actively understand the working principle of different routing protocols, and guide students to conduct comparative study on the performance

indicators of various routing protocols. During the experimental teaching, the whole class can be divided into different learning groups, and the students who have learned well can be designated as the group leader to lead the students to complete the experimental teaching task according to the content of the experimental instruction.

After the completion of the teaching experiment, the group is required to carefully analyze and discuss the experimental results, and write an experimental report to make statistics and analyze the investigation results through the implementation of one semester. Analyzing the elements of simulation teaching; In view of the good communication process between teachers and students in classroom teaching and experimental teaching, this paper puts forward three major elements in the teaching process, namely, teachers, students and teaching resources. This is helpful to determine the reliability and effectiveness of NS simulation-based teaching software, which establishes a good interaction among teachers, students and teaching resources. After an experiment in the teaching stage, a practical computer network course teaching system based on NS simulation technology is finally formed according to the acceptance of students.

4. Optimization of Computer Major Curriculum System Based on Simulation Technology

1) In view of the rapid development of simulation teaching, the application of this technology in computer courses is an inevitable trend. However, as far as the current situation in China is concerned, the main application focuses on the domestic key state-owned university and some individual specialties in higher vocational colleges, and the teaching mode of studying and applying this technology to colleges and universities is less. It is with this as the breakthrough point that the optimization of this system is more comprehensive.

2) In the teaching, the training objectives of the course are taken as the guidance, the simulation technology is combined with the theoretical and practical learning of the students, so that the students can quickly understand abstract theoretical knowledge, improve the learning efficiency of the students, and apply it to the actual work, so as to realize the flexible use of learning.

5. Conclusion

In the teaching of computer major courses, how to truly show professional scenes in teaching activities, implement network behaviors, make teaching classes more vivid, make teaching forms more lively, and further improve students' enthusiasm and initiative in learning is the focus of current computer major course teaching. Through the analysis in this paper, it is found that the NS simulator and its open interface can be applied to the teaching of computer professional courses, and as an auxiliary teaching tool, through the combination with the corresponding teaching methods, better teaching effect can be obtained, and the disadvantages of the traditional teaching mode can be eliminated. At the same time, it puts forward more challenges to teachers. On the one hand, teachers must be able to skillfully use NS development system, on the other hand, they must choose appropriate cases in teaching. In addition, the principle of gradual and orderly progress should be adhered to in the specific teaching process so as to achieve better teaching results.

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