Research on the Application of Virtual Simulation Technology and Vocational Education Teaching

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Abstract. Practical Teaching is Very Important to Vocational Education, But There Are Many Difficulties in Vocational Education Teaching. On the One Hand, It Is Impossible for the School to Set Up Its Own Internship Factory for Its Own Major Due to the Restrictions of Capital Investment and Teaching Funds, Venues and Professionals. On the Other Hand, How to Find the Best Teaching Mode between the High Expectations of the Society for Vocational Education and the Students with Low General Scores? Education Simulation Technology Can Meet the Requirements, the Simulation Technology in Vocational Education, the Author of This Paper How the Product Development, Design, Development Method and the Application of Simulation Technology in the Vocational Education Mode, Application Characteristic and Using Effect Were Discussed.

1. Introduction
No matter secondary vocational students or senior vocational students love games, can we make children love learning in games? “Games are children's most legitimate behavior, toys are children's angels.” Lu xun's words really illustrate the relationship between children and games. In primary and middle school students as the service object of the bee bee park in 20 nearly 10 years of experience in teaching Chinese, maths and English senior teachers, with the help of the built huge, knowledge question bank system for 5 ~ 12 years old children, and the system with the game, tasks, organically. Let the child learn actively in the “learning task” game, the effect is 5~6 times as good as passive learning. NBGI, a gaming company, is trying for the first time to make elementary school textbooks[1]. Shanghai world expo has the largest number of simulation places; Wuxi virtual museum of western art is after Egypt, Italy, the world third virtual western art museum, everybody was impressed by the charm of western art, more plaint to at home can enjoy the elegant art closely. Visitors can ask questions through the microphone in the painting hall with the Mona Lisa on the wall. Many wonderful interactive projects surprise visitors.

Simulation technology is a multi-disciplinary comprehensive technology, it was similar with control theory, system theory, the principle and the basis of the information technology, by means of computers and special equipment, based on the actual or vision system model for dynamic test[2]. For example, a pilot training simulator for an airplane or car is the result of applying simulation technology. The development of information processing and network technology has actually completely changed the concept of simulation. Vocational education combined with industry characteristics, combining advanced simulation technology and network technology, the real equipment and computer simulation system of integrated simulation system simulation environment, the situational teaching environment, and make learning become the conscious action[3].

2. Application of Simulation Technology in Education
The application of simulation technology in education can be divided into pre-school education, elementary and secondary education, vocational education, university education, military application, life application and tourism application[4].

Vocational education simulation technology has applied in theoretical teaching, experiment, practice, especially the training of professional skill appraisal, is the best platform to display simulation technology, according to the different time, requirements, we are looking for simulation training and field training time than, in order to achieve the best effect, achieve the following goals[5].

(1) stimulate students' enthusiasm for learning
Some of the functions of the simulation system cannot be realized by field experiment and production practice. For example: modify the main process parameters of the operation process; Students can operation situation of the automatic tracking, record, and make a judgment, hit points, students from get the scores can be active to find the reason, hands-on revisionist actively, make oneself of the operation results are satisfactory results; The operating results of students can also be summarized into tables and printed out to objectively and impartially reflect their operation conditions. Intelligent system can help analysis the reason, students can not only for themselves, and can see the results, more can not perfunctory, greatly improve the students' study interest, arouse the initiative and enthusiasm of learning.

(2) improved students' observation ability and adaptability to change
The human hand of the simulation operation is one machine, and everyone can do it by himself. He is familiar with the normal operation of opening and stopping, changes some main process parameters, and understands its impact on the process. Teachers can also set up some accidents so that students can analyze, judge, find out the reasons and deal with them through the on-site phenomenon. In the course of training, students can also design accidents, observe phenomena and deal with them by themselves, so as to get rid of the dependence on teachers, enhance their independence and greatly improve the teaching quality.

Features of education simulation technology in vocational education, computer simulation technology is mainly used for teaching and training and production and operation simulation. The application of simulation technology in professional education has the following characteristics and advantages:

(1) investment saving, consumption reducing, relative and dynamic millions of actual production device or equipment for the construction of the investment, establish a corresponding simulation teaching system of its investment should be much smaller, computer room, 50 purchase the corresponding simulation software, more than 30, can undertake practice for 150 people, usually the simulation teaching system of the investment is a small percentage of the actual system investment; The simulation system is usually run on the computer in the form of software. The materials and energy consumption are very low and there is little maintenance.

(2) to many people at the same time, improve the efficiency of teaching, simulation teaching software run on ordinary PC, can run at the same time, the network operation, let every student can do it yourself. This model is very suitable for the school's centralized teaching mode and our national conditions. Teaching and skill training with simulation system is more efficient than teaching with actual equipment or equipment, especially at the beginning of practice.

(3) teaching flexibility of strong, rich in content: simulation teaching system usually has a record and recall function, make the teaching can be in the midst of a process or local repeatedly, helps to solve the important and difficult problems in teaching. The combination of simulation technology and multimedia makes the simulation system more vivid, vivid and realistic. Its rich and vivid interface has a strong attraction for students, who have higher interest and initiative in learning.

(4) can be automatic grading and record, easy to teaching organization and management: simulation teaching system for students to track each step operation function, and can according to the operation requirements scientifically evaluate students' operating process automatically. It also makes the organization and management of teaching more convenient and easy. The simulation teaching system is also more suitable for the combination of individual teaching and concentrated teaching.
(5) widely used: manufactured from highly dangerous or difficult system to the general process can be simulated, can students autonomous learning or auxiliary teaching, but in reality many operating phenomenon could not be achieved, but the simulation software with ease. In the electric power and petrochemical industry of our country has made the simulation technology products for on-the-job workers technical level (skill appraisal) identification, simulation technology has become the main its practical operation skills examination method, and obtained by the competent department of high praise.

3. How to Develop the Simulation Technology Products That Can Adapt to the Professional Education

The state's requirements for professional education are: to cultivate high-quality and highly skilled professionals. Vocational education mainly in the quality of training, professional should know and should be two parts, should know is mainly refers to the students should master the basic theory knowledge, how to realize the teaching content of the original is the classroom teaching; Should be able to refer to the practical application skills that students should master, namely the practical teaching content, its teaching method is to carry out various kinds of practical teaching in the laboratory, the practical training room; Second, to the actual enterprises and enterprises field practice teaching.

The teaching of internship is the most prominent difficulty in vocational teaching. On the one hand, it is more and more difficult to find suitable enterprises for internship teaching. On the other hand, even if a suitable enterprise is found, it is impossible for the enterprise to provide hands-on operation opportunities for the students of internship in consideration of the safety, stability and benefits of its own production. As a result, it is difficult to achieve the proper effect of internship teaching, and it is difficult to achieve scientific and reasonable organization and assessment of internship teaching.

Simulation products can be developed from quality training and professional knowledge and knowledge. Vocational education simulation teaching system should be designed and developed on the basis of project teaching results in accordance with the requirements of teaching syllabus. It can be developed either by reference to actual experiments or devices or equipment, or by design. In particular, experiments with large investment and high environmental requirements are of more development significance. The simulation teaching system usually includes the following functional contents: experimental preview CAI courseware (including experimental principle, equipment and tools introduction, and even video recording of experimental operation process); Experiment simulation operation and score; Generate test report manually/automatically; Lab questions. The simulation teaching system should meet the requirements of two aspects: first, it must be a device or equipment in actual production, and it must have the typical characteristics of the industry and the major. The second is to meet the specific requirements of internship teaching. Simulation teaching system design and development should also as far as possible in accordance with the industry's professional qualification specification development (skills), such a practice not only can satisfy the practice teaching, simulation teaching system can also access “professional qualification certificate” as an important assessment tool. Generally, the internship simulation teaching system should have the following functions: it conforms to the actual production process and equipment simulation function; Typical operation method in actual production (man-machine interface); Scientific configurable operational evaluation system; Perfect teaching management function.

Through the simulation teaching, students' interest in the practical link, their familiarity with the process, their ability to analyze and solve problems and their overall harvest have been greatly improved. The simulation teaching provides a vivid and realistic environment, which makes it have the outstanding characteristics of the traditional teaching mode incomparable in the practical teaching. It can be seen that students' interest in the practical process, their familiarity with the process, their ability to analyze and solve problems and their overall harvest have been greatly improved. The simulation teaching provides a vivid and realistic environment, which makes it have the outstanding characteristics of the traditional teaching mode incomparable in the practical teaching.
The application of the simulation teaching system can well realize the ideal teaching desire of everybody doing the operation training, teaching more convenient and evaluating more scientific.

Simulation software is absolutely not a substitute for the real practice, of course, in order to make students to actual production operation process of enterprise environment, process, operation conditions and so on have a better knowledge and understanding, in the simulation before or after the internship training, arrange students to the proper site practice training center or the related enterprises, can get more satisfactory results.

Many schools have applied the internship simulation teaching system to the practical skill assessment of vocational qualification examination, which has become a very good means for schools to implement the “double certificate system”.

Through the efforts, we will form three levels of the teaching material: paper textbooks are compiled according to the theoretical system in the past, in recent years begun to “project teaching system based on the teaching material, and even develop some cartoonish textbooks for secondary vocational requirements. According to teaching practice of making audio-visual teaching material, generally adopts the narrative type, in the paper on the basis of the teaching materials and audio-visual materials rich developed simulation software, the theoretical system and task type two lines to guide students to learn.

Table 1: Types of Teaching Materials for Secondary Vocational Education

| Type               | Paper textbooks | Audio-visual materials | Multimedia | Network | Simulation software |
|--------------------|----------------|------------------------|------------|---------|---------------------|
| Various formats    | Theoretical system | Theoretical system | Theoretical system | Theoretical system |
| Project system     | Narrative type | Project system | Project system | Task type |
| Cartoon            | Cartoon | Cartoon | Cartoon |

4. Existing Professional Education Simulation Software and Existing Problems
Current simulation software mainly has the following problems:

(1) the plane simulation system can meet the basic requirements of professional education. For some operations, which require strong immersion, 3D display and simulation gloves should be actively introduced to enhance the effect.

(2) too high development cost will affect popularization. Simulation professional committee of China education technology association launched in Beijing in July 2010, the national “simulation technology into the campus” activities, organize more development institution reform and application of schools participate in the plan, reduce the cost.

(3) too few application hardware platforms. Simulation study is to understand relevant knowledge on computer, greatly increase the demand for computers, almost in accordance with the third configuration computer students, is now configured computer school twice, school financial resources are limited, if let students bring their own computer, or mobile phone platform will greatly ease the pressure from shortage of platform.

5. Development and Application Prospects of Simulation Technology in Vocational Education
Simulation technology has high development cost and large investment for the application of professional education. In the future, there will be a variety of models co-existing:

(1) government-led: like the construction of quality courses, government investment is Shared by all. Liaoning province invested 30 million yuan to develop simulation software in more than 10 vocational and technical colleges during the tenth five-year plan period, which greatly exercised first-line teachers and formed a number of simulation professional groups.

(2) the company's leading model: for example, the maintenance electrician of dalian tongke and the car maintenance of Shanghai jingge, the company actively seeks schools and designs successful teaching products of single work with simulation technology.
(3) schools or leading industry association: want to develop a professional, focuses on the application of simulation technology, investment funds and active cooperation with powerful company, single type of work teaching product development.

(4) personal DIY: simulation technology is everywhere, and some skills can be targeted at open simulation software. How to measure the temperature accurately.

(5) school development and application combined form: in March 2011, the establishment of the coal carbon school simulation software development consortium formed a new mechanism. Each school invests 100 to 500 thousand yuan, nearly ten school companies participate, everybody division develops, share.

Simulation technology in the product development and application of vocational education has become more common in developed countries, some of the industry in our country have also been widely used in the main professional, also has attracted the attention of a great general vocational education workers. With the development of computer software and hardware technology, network technology and the reform and deepening of professional education, the application of simulation technology in professional education will be further developed. Simulation results will be better and more realistic. Simulation technology will also promote the development of remote education and promote the maturity of new majors. With the joint efforts of all, all kinds of development modes are in full bloom, which will jointly create a comprehensive application of simulation technology tomorrow.

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