Design of Colleges and Universities Mechanical Simulation System Based on Computer VR

Lin Zheng
Jingchu University of Technology, China
*Corresponding author email: zhenglinty@yeah.net

Abstract. With the rapid development of network technology, the traditional teaching methods can not adapt to the teaching objectives of colleges. VR has become a basic teaching tool in Colleges, which can help teachers complete teaching. At the same time, VR can improve students' interest in learning, which can help students explore more subject knowledge. Mechanical specialty is an important subject, which requires simulation and other learning. At present, there are many kinds of software in the world, which can carry out mechanical simulation, such as SolidWorks, 3DMAX, flash and so on. Through the relevant software, colleges can design the mechanical simulation system, which can help to set up the whole process resource library in a certain field. Through the resource library, colleges can help to complete the three-dimensional entity display of equipment, which can be displayed in an all-round way. Through VR, we can help students understand the real work scene, which can help improve the students' mechanical design ability. At the same time, through computer VR, colleges can help students learn more about the working scene of mechanical design. Firstly, this paper analyzes the importance of mechanical simulation system design. Then, this paper designs the related system content. Finally, some suggestions are put forward.

1. Introduction
With the increasing authenticity of VR technology, VR has been applied to a variety of fields, especially in the field of education. Through VR technology, we can build a systematic simulation system, which can help colleges better carry out teaching. Through VR, colleges can improve students' immersive experience, which can transform the traditional cognitive interactive experience. Through the virtual world, students can explore mechanical simulation design in more detail, which can greatly interest students in exploring mechanical design. Through the simulation system, colleges can improve the abstract structure of subject knowledge, which can improve the learning efficiency and shorten the learning cycle. At the same time, the virtual simulation system can help students better learn the process of mechanical design, which can carry out better simulation experiments. Through the three dynamic model, colleges can establish a virtual design laboratory, which can better achieve practical teaching. Therefore, colleges must establish a mechanical simulation system, which has a very important practical significance.

2. The Importance of Mechanical Simulation System Design

2.1. Basic Principles of System Design
The design of mechanical simulation system is a system developed by Java, database and other technologies, which can be used as a network simulation platform. Through the mechanical simulation system, students can master the basic skills of the subject, which can complete the experimental content set by teachers. At the same time, the simulation system has a variety of characteristics, such
as visualization, interaction, easy operation, which can help students better grasp the mechanical design ability. First, visualization. The simulation platform can provide graphical operation interface, which is more convenient for students' mechanical design and simulation application. At the same time, we should establish a variety of resource library, which does not need to realize the operation process through programming. Therefore, the graphical interface can simplify the design process, which can make the mechanical design process more simple. Second, interactivity. The simulation platform should have strong interactivity, which can identify and process a variety of file formats. Through strong interaction, colleges can improve the high application of simulation platform. At the same time, the simulation platform can satisfy the whole interaction process of input and output, which can complete the design based on instructions. Third, scalability. Software design must follow scalability, which can add new functions to the software. Through many functions, we can enhance the practicability of the software. Fourth, security, which is the basic condition of the system platform.

2.2. The Importance of Virtual Teaching
Virtual teaching has become an important tool in college teaching, which can help teachers better carry out mechanical design work. Through the mechanical simulation system, we can help students more intuitive learning mechanical hydraulic, mechanical transmission and other aspects of the principle. Through animation and other ways, students will directly acquire knowledge through visual interaction, which eliminates the disadvantages of traditional theoretical knowledge indoctrination. Through animation assisted imagination, students can more deeply grasp the mechanical simulation technology. Therefore, virtual teaching has many important functions. First, virtual teaching can help students visualize the basic principles, which can consolidate the theoretical knowledge. Second, virtual teaching can improve students' learning enthusiasm, which can improve their practical ability, analytical ability and creative thinking. Third, virtual teaching can reduce the pressure of teachers' teaching. Traditional teaching methods require teachers to explain constantly in every class. Through virtual teaching, teachers only need to make a courseware, which can ensure the quality of the whole teaching grade. At the same time, the virtual teaching platform can provide better resources, which can help students better complete the teaching.

3. Design of Mechanical Simulation System

3.1. System Overall Design
Mechanical simulation system is a comprehensive network platform, which is a skill based teaching software. The system is mainly composed of hardware, software, database and interactive equipment, as shown in Fig.1. In the stage of system requirement design, we should improve the requirement analysis of system function and the design of realizable function, which can better carry out the design of function module. The system function module mainly includes design, interface setting, script writing and so on.

![Figure 1. Overall design of mechanical simulation system](image)

3.2. Software Making
Mechanical simulation system needs many kinds of resources. The resource production process is mainly divided into a variety of stages, including script writing, data collection, material production, physical property setting, interactive function setting, system synthesis, software testing, etc. After the trial, we can make later modification, which can better complete the production process of the software system, as shown in Fig.2.
3

Figure 2. Flow chart of mechanical virtual simulation system software

4. Design and Application of Mechanical Simulation System

4.1. Demonstration Teaching of Mechanical Equipment Operation
Through the simulation system, we can realize the operation demonstration teaching, which can help students better understand and use the mechanical equipment. Through the simulation system, colleges can alleviate the pressure of funds, which can reduce the actual equipment purchase and operation costs. Therefore, colleges can improve the demonstration teaching ability, which can enhance the teaching quality of students. Through the simulation system, students can quickly form memory, which can better realize the familiar operation of the equipment. In this way, colleges can better realize the operation, which can improve students' understanding of the operation of the equipment. Therefore, we must strengthen the design of mechanical simulation system, which can be applied to demonstration teaching.

4.2. Interactive Training of Equipment Operation
Through virtual operation simulation, colleges can realize the main teaching function of equipment operation, which can improve the interactive training of equipment operation. Through virtual simulation, students can fully understand the basic knowledge of equipment operation. Through video explanation and other ways, students can understand the specific situation of equipment operation in real time, which will increase the convenience of students' learning. At the same time, through immersive, students can more fully understand the explanation of equipment operation. Therefore, the operation of production equipment can improve the students' operation training level, which can solve the traditional limitations. Through the simulation system, we can improve the professionalism of students, which will be more scientific to achieve interactive training of equipment operation. Through the virtual simulation experiment, students can operate the equipment many times, which can also avoid the compliance operation in reality. When the operation is wrong, the simulation system can prompt the alarm, which can strengthen the students' deep cognition. Therefore, students can objectively understand the mistakes, which can deepen the learning effect.
4.3. Equipment Disassembly and Installation Training

Through the simulation system, we can display the explosion diagram of various parts of mechanical equipment, which can make students understand the composition of the equipment more scientifically. Through the construction of 3D prototype model, students can train disassembly and installation in the virtual system, which can better realize the installation and debugging of mechanical system equipment. At the same time, mechanical equipment often has the characteristics of large volume and complex structure, which will also increase the cost of practice teaching in Colleges. Therefore, it is difficult for colleges to carry out disassembly and installation training on actual equipment, which will increase the risk of equipment scrap. Therefore, the simulation system can help students with virtual disassembly and installation, which will improve the virtual application of equipment. At the same time, students can watch the assembly process from multiple perspectives, which can improve the proficiency of the equipment. This paper lists the demolition explosion diagram of the digital prototype of shearer, as shown in Fig.3.

![Image of demolition explosion diagram of shearer digital prototype](image)

**Figure 3.** Demolition explosion diagram of shearer digital prototype

5. Conclusion

With the increasing status of machinery in the social economy, colleges need to constantly strengthen the teaching level of machinery. Through the mechanical simulation system, we can improve the learning resources of the whole professional students, which can help students master more mechanical design technology and tools. With the development of China's mechanical modernization, the traditional mechanical design mode will be gradually eliminated, which requires us to continuously improve the diversity of parameter design and analogy test. Therefore, colleges must design a mechanical simulation system, which can better improve the teaching ability of mechanical discipline.

6. References

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