Exploring the Application of Virtual Simulation Technology in Engineering Experiments

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Keywords: Engineering technical; Virtual simulation technology; Engineering experiments.

Abstract. In the development of engineering technical, the teaching of engineering experimental has received extensive attention. It cannot only cultivate students’ ability to master professional knowledge, but also comprehensively improve students’ ability to practice and explore. Students may meet some problems in engineering techniques and learn to solve them. Therefore, virtual reality teaching can improve students’ ability to analyze and solve the practical engineering problems, promote the combination of theory and practice, enhance students’ practical ability and improve experimental teaching level finally. It will provide new ways and methods in training creative ability of college students, which can open up a way with modern engineering technical conservancy characteristic for the cultivation of practice and innovation abilities for students.

Introduction

According to the important instruction spirit of general secretary Xi Jinping on strengthening practical education, and the relevant requirements of education informatization points. Combining virtuality with reality, complementing each other and being able to be real. To cultivate students' comprehensive practical ability and innovation and entrepreneurship ability as a starting point. It is necessary to creatively build a high-level practical teaching platform of engineering technology, improve teaching ability, expand research field and enrich classroom teaching content. With the development of modern education technology, virtual simulation technology has been introduced into practical teaching in universities and colleges, playing an important role in the teaching of engineering and technology majors. Virtual Reality, in which the user is “immersed in and able to interact with a synthetic world” offers an enticing opportunity to offer simulated learning experiences in a novel and engaging way [1]. Custom made of virtual simulation software that meets their academic requirements can improve teaching ability, expand the field of practice, enrich teaching content, reduce costs and risks, to carry out green experiment teaching. In the current teaching plan, experiments and practice links have been through the whole teaching process, in cultivating students' engineering awareness, scientific truth-seeking and innovative spirit, improve students' engineering practice ability and comprehensive quality to play an important role, lay the foundation for the development of the environmental protection industry in the cultivation of interdisciplinary, innovative talent [2].

In order to solve the problem of cultivating and improving student’s ability to handle complex engineering problem in engineering higher education and the problem of practice teaching in talent development in the training of higher engineering education talents, to overcome the practical teaching problems in the cultivation of chemical talents, "Virtual reality, first virtual reality, combination of virtual reality and real reality", an intensive engineering education platform that integrates software virtual simulation, physical model simulation and pilot production training in "Trinity, integration" It can meet the training needs of advanced chemical talents and achieve the effect of engineering practice education of "combination of imitation and practice, unity of theory and practice" [3].
Application of Virtual Simulation Technology in Practical Teaching

Engineering experiments are often accompanied by high pollution, high consumption and high cost. With a high degree of automation, modern enterprises have high requirements for on-site operations, and most positions must be held by certificates. For the sake of factory production and students' personal safety, enterprises further limit the time and space scope of students' on-site production practice, making students unable to go deep into the production site and achieve the effect of practical teaching [4]. In order to improve the shortcomings, using the virtual simulation training combined with the practical training of the students, with its vivid sense of "reality" to attract students firmly, the situational teaching guiding type teaching method and discusses the problems, so that the students with questions experience, while learning, to fulfill their potential, improve the ability of problem solving, which changes the traditional teaching mode, implement green experiment teaching. Through the 3D perspective, the virtual simulation experiment enables students to be in the laboratory as if they were in the actual engineering experimental and carry out actual production operations, thus making up for the shortcomings of traditional experiments and practice. Students can shuttle between engineering training base and virtual simulation software to fully experience the operation satisfaction brought by the complementary advantages of reality and virtual. It can further improve students' practical operation ability, problem analysis, problem solving and innovation ability, so as to truly master the control and processing equipment technology [5].

The Effect of Virtual Simulation Experiment on Engineering Experiments

Virtual simulation experiments on Khalid ents, in order to enhance students' engineering practice ability and innovative spirit as the goal, continue to promote the advanced scientific research achievements, the combination of modern information technology and experiment teaching, provides students with a platform independent play, also study for "interactive," "flip" class, "scenario simulation," "discussion-based" and "case" in the new education mode into environmental engineering experiment to provide a new ideas, new methods and means, in a teaching experiment and training teaching reform and the development of science and technology play a positive role in promoting [6].

The implementation of the simulation experiment project has improved students' initiative in learning and cultivated their team spirit and cooperation ability. After the application of virtual simulation experiment teaching method, students will actively put forward questions and think positively when encountering problems. During the study, each member of the team studied the problems from different perspectives and Shared their gains with others, which expanded the learning ideas, improved the learning efficiency and increased the learning harvest. Teachers can be more targeted to students' guidance, because teachers participate in the whole process of students' discussion and have a more comprehensive understanding of students' knowledge structure, so they can be more targeted to students' guidance, improve teaching efficiency and increase students' learning autonomy. Virtual simulation experiment teaching for teachers, students, provides a risk free, low cost of a new form of teaching, the students by manipulating the model elements, students can break the time and space limit, through repeated practice, virtual operation model can also be designed experiment scheme, interactive, strengthened the experimental teaching to improve the practice ability and the comprehensive innovation ability, the purpose of cultivating the students creative thinking and practical ability, realize the expected effect of experimental teaching.

The Potential Engineering Applications of Virtual Simulation Technology

The virtual simulation experiment project further improved and enriched the content of classroom teaching and engineering practice, presented the learning and training contents in multiple dimensions, constantly improved the virtual simulation space-time environment to attract students from the visual, auditory and kinesthetic aspects, and stimulated learners' interest in learning. For users customize mode for its purpose and meet the experimental conditions, lets the student in the
fully open experiment environment to complete the comprehensive training, further improve the
students' ability to analyze and solve problems, make students truly understand engineering practice
and process, eventually to improve students' ability of independent design and innovation practice
[4]. At the same time, can maximize construction of education resources sharing platform, to build
into a discipline integration, network Shared virtual simulation comprehensive practice base, open to
the whole society in colleges and universities and corporate training employees to use, to provide
nationwide environmental protection enterprise staff training and examination platform, improve
education resource utilization. In the future, we will make better use of virtual simulation teaching
resources to meet the teaching needs of different regions, schools and disciplines [7, 8].

Conclusion

In conclusion, virtual simulation teaching has high efficiency, low cost, rich content, performance.
Advantages such as efficiency and safety, it is helpful to combine virtual simulation teaching with
real teaching to improve the effect of practical teaching, students overcome the limitations of the site
and equipment, master more practical skills. In order to create outstanding engineering and technical
personnel, it is necessary to reform the engineering practice teaching system. Starting from the
practical goal of engineering technology training, this paper constructs the engineering practice
teaching system of "combining virtuality with reality" and puts forward practical teaching guarantee
measures.

Summary

Virtual simulation experiment teaching is an important content of informationization construction
of higher education, which is the product of deep integration of subject specialty and information
technology, in cultivating students' engineering awareness, scientific truth-seeking and innovative
spirit, improve students' engineering practice ability and comprehensive quality to play an important
role, lay the foundation for the development of the environmental protection industry in the
cultivation of interdisciplinary, innovative talent. Custom made of virtual simulation software that
meets their academic requirements can improve teaching ability, expand the field of practice, enrich
teaching content, and reduce costs and risks, to carry out green experiment teaching.

Acknowledgement

Fund projects: Jilin Institute of Higher Education (JGJX2018D358); The 13th five-year plan of
Education Science in Yanbian university (ZD2018004).

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