ISSN 2616-7433 Vol. 2, Issue 18: 99-103, DOI: 10.25236/FSST.2020.021815

Construction and Thinking of National Virtual Simulation Experiment

Chen Jun

Jiangsu Maritime Institute, Jiangsu Nanjing, 211170, China

ABSTRACT. *The application of virtual simulation experiment teaching benefits from the high development of current network technology and computer technology. In the practical application process, virtual simulation experiment teaching can be applied to some experimental contents that are difficult to be completed under the real experimental conditions such as high cost, high experimental risk coefficient and large comprehensive experiment. Based on this, this paper considers the construction significance of national virtual simulation experiment teaching project. This paper analyzes and summarizes the categories of virtual simulation experiment construction, network construction and openness, hoping to provide valuable reference for the future upgrading of this field through the development of relevant research work.*

KEYWORDS: *Virtual simulation, Project construction, The teaching application*

1. Introduction

Introduction: In the context of the Internet age and the information age, the high integration of information technology and experimental teaching itself is also an effective way to share teaching resources. By providing some more open services, we can effectively expand the richness of experimental teaching content. This can also play a vital role in improving students' practical ability and experimental teaching quality. During the 13th Five-Year Plan period, the Ministry of Education has strongly supported the development of national virtual simulation experiment projects. Since 2017, there have been more than 2,000 experimental projects on the national virtual simulation experiment teaching project platform. This has a vital impact on promoting the integrated development of teaching, industry applications and technological innovation.

2. Basic Purpose of Project Construction

The construction of national virtual simulation experiment teaching project aims at promoting the full integration of information technology and higher education, and accelerating the integration of relevant teaching resources with the help of

ISSN 2616-7433 Vol. 2, Issue 18: 99-103, DOI: 10.25236/FSST.2020.021815

advanced network information technology. At the same time, through the construction of higher education information infrastructure, committed to the further development of various teaching resources.The basic purpose of the project construction is to solve the teaching conditions that are not available under the real implementation conditions. In the face of some high-cost, high-risk and high-consumption experimental projects and large-scale comprehensive training projects, it can provide a special development path.

3. Main Contents of Project Construction

The construction of virtual simulation experiment teaching project is helpful to promote the informationization of experimental practice teaching in colleges and universities. By further expanding the content of experimental teaching, the depth and effectiveness of experimental teaching can be effectively enhanced. The construction of virtual simulation experiment teaching project needs to fully combine the training standard of experimental practice teaching talents in colleges and universities, the scientific research achievements of different specialties and the training objectives of talents. In the research and development process of the project, practical teaching requirements and teaching content should be taken as the premise, and attention should be paid to the consideration of content, duration, difficulty and other aspects. According to different experimental types, the implementation is set as innovation type experiment, basic type experiment and comprehensive type experiment. To provide students with more targeted choices in different majors. In order to ensure that teachers and students can have a more accurate grasp of the professional knowledge involved with experimental training, it is also necessary to fully combine the physical experiment and virtual simulation experiment. From shallow and deep guide students to the deep learning content over. In the process of experiment, the link of experimental teaching should be designed before the course teaching. For participants, they need to be fully familiar with and understand the operation process of the experiment. Before the experiment, teachers should design the corresponding questions. Let students take part in the experiment with problems in mind, which can also effectively guide students to find problems, solve problems and think about problems. In the subsequent classroom teaching, the problems found in participating in the virtual experiment can be discussed. On the one hand, such a form can effectively activate the classroom atmosphere, and on the other hand, it is also helpful for students to further understand the learning content. Teachers should give full play to their guiding role and interpret the controversial points in students' discussion. If conditions permit, teachers can also organize teaching by organizing practical experiments. In this way, students can have a more intuitive understanding of experimental phenomena and their practical operation ability can be effectively improved. In the form of virtual experiment service entity experiment, it is also a scientific model of the combination of virtual and real.

At present, the national virtual simulation experiment teaching project has been gradually upgraded and developed according to the discipline categories, and has involved many disciplines such as agriculture, forestry, engineering, humanities and

ISSN 2616-7433 Vol. 2, Issue 18: 99-103, DOI: 10.25236/FSST.2020.021815

law. In the process of project construction, in order to ensure the application quality of the experiment, it is also necessary to carry out project construction around a specific course. In order to highlight the purpose of the experiment, it is more convenient to show the experimental principle. Pay attention to the design and optimization of experimental steps, strengthen the improvement of experimental results and experimental evaluation system, with the support of 3D technology and Internet technology, to promote the realization of the above goals. It can be said that immersive interactive experience is the main highlight of virtual reality technology, so in the process of human-computer interaction interface design should also give its appeal and expression. In this way, experimenters can be better substituted into the virtual experimental environment, and then get the ideal experimental teaching effect. Finally, in the process of project construction, it is necessary to follow the related system induction method. Ensure that the development and upgrading of technology is carried out within the constraints of the system. This is also an important factor to ensure the healthy and stable development of the project

4. About the Website Construction and Sharing

Contemporary college students are all the fans and beneficiaries of electronic products. In such an era, traditional teaching methods are naturally difficult to meet the needs of students. With the help of the construction of network sharing platform, it has become possible for different people around the world to share high-quality teaching resources. With the continuous development of human-computer interaction technology, artificial intelligence and other technologies, virtual simulation experiment technology has become an important development path and norm of experimental teaching. Therefore, relevant practitioners also need to pay attention to the expansion of their own thinking and arm their minds with an open attitude, so as to better facilitate the construction and development of simulation experiment teaching projects.

The development and sharing of network resources does not mean that there is no restriction. It is necessary to develop and share resources on the basis of strictly observing relevant laws and regulations, which is also a kind of respect and recognition for the resource holders. Therefore, in the process of resource development and sharing, it is also necessary to divide responsibilities and rights of resources themselves. Only in this way can the coordination and efficient utilization of network resources be promoted.

5. Some Thoughts on the Project Construction

In the process of experimental project construction, since each experimental project needs to target a specific experimental part, does it need to involve interdisciplinary in the construction process? Is there a need for a strict hierarchy of basic and comprehensiveness in the curriculum? At present, VR technology is the main technical support table for providing immersive experience. Currently, wearable devices and head-display devices developed can enable participants to

ISSN 2616-7433 Vol. 2, Issue 18: 99-103, DOI: 10.25236/FSST.2020.021815

experience the immersive feeling. On the other hand, the experience on the WEB side at the relevant level is not ideal. In the context of the increasing cost of network maintenance and system upgrade, it is also necessary to evaluate the experimental results and equipment efficiency. It is necessary to strengthen the in-depth understanding of VR technology, and at the same time, different designs can be made according to the development requirements of different disciplines. It is not only necessary to rely on virtual simulation experiment teaching, but also need to actively expand other development paths of actual experiment teaching. At present, the scale of virtual simulation project is getting larger and larger, and it can be predicted that the problems of resource integration and sharing will be exposed in the future. Therefore, in the current construction process, is it necessary to strengthen the top-level design to avoid the repetition or omission of some content? At last, the early laboratory team also needs to pay attention to. Different from the previous teaching mode, the experimental method and teaching form should be further explored and studied under the background of virtual simulation experiment teaching.

6. Conclusion

At present, China has made remarkable achievements in the construction of state-level virtual simulation experiment teaching project, but there is still a great space for development in the exploration of operation mode, management mechanism and experimental method. It also poses a great challenge to the development of related fields in the future. Based on this, this paper considers the construction of virtual simulation experiment teaching project based on the practice of national virtual simulation experiment teaching project, hoping to provide valuable reference for the development and upgrading of this field in the future.

Acknowledgments

Fund project: Key Research Topic of Educational Information Technology of Central Audio-visual Education Center (186120006).

References

[1] Zhao Gengsheng, Liu Lei, Xiang Peijun, et al (2016). Design and Assessment of Virtual Simulation Experiment Project -- A Case Study of Computer Network Course [J]. Software Guide, vol.15, no.7, pp.215-217.

[2] Li Shuxian, Ma Zongmin (2018). Virtual Simulation Experiment Project Construction and Theoretical Mechanics Experiment Teaching Reform Thinking [J]. Industry and Technology Forum, vol.17, no.10, pp.144-145.

[3] Mi Chengji, YU Jianghong, Qiu Xianyan, et al (2018). Practice and Exploration of Promoting Professional Competence Improvement by constructing mechanical virtual Simulation experiment Project in application-oriented local Universities [J]. Internal Combustion Engines and

ISSN 2616-7433 Vol. 2, Issue 18: 99-103, DOI: 10.25236/FSST.2020.021815

Accessories, no.23, pp. p.254-255.
[4] Wang Sen, Gao Dongfeng (2018). Thinking on the Construction of online Open Virtual Simulation Experiment Project [J]. Experimental Technology and Management, vol.35, no.261, pp.115-118
[5] Guo Junhong, CUI Jinfeng, Yang Baoping (2016). Construction of Virtual and Real Simulation Experiment Project in the Context of New Engineering [J]. Experimental Technology and Management, vol.36, no.8, pp.119-122.
[6] Su Xuxia, Liu Su Nan, Guan Lixin (2008). Carrying out virtual Simulation Experiment to Promote experimental Teaching reform [J]. Science plaza, no.3, pp.252-254.