Research on Teaching System of Anesthesiology Based on Virtual Reality Technology

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Abstract: At present, advanced technologies such as Big Data, Artificial Intelligence, Cloud Computing, and the Internet of Things are gradually being applied to course teaching, which further promotes the informatization of the course. Under this background, correlated course teaching should actively explore the development of course teaching informatization. Considering the teaching of anesthesiology, it's impossible to apply anesthesia technology and drugs on humans or animals at the beginning of learning. At this time, the use of virtual reality technology can effectively train students' practical operations and ability of anesthesiology, which is of great significance for further improving students' clinical practice ability. This article mainly introduces the advantages of virtual reality technology application, studies the current status of virtual reality technology, and analyzes the effective application strategies of virtual reality technology in anesthesiology teaching.

Keywords: Virtual Reality Technology; Anesthesiology; Application Strategy

1. Application advantages of virtual reality technology

The application of virtual reality technology in the teaching of anesthesiology courses mainly refers to the simulation of the relevant anesthesia reality scenes to make the students feel as if they are in it, and simulate the scenes of clinical anesthesia practices. Anesthesia training, through the application of virtual simulation technology, solves the problem of lacking practical learning places for medical students at the learning stage, and also enables students to make a lot of preparations before initiating a real clinical practice attempt to strengthen the anesthesiology Understanding and mastering knowledge can better accumulate anesthesia experience and knowledge, and exercise anesthesia implementation skills. From the perspective of application advantages of virtual reality technology, it can effectively solve the shortcomings of existing technologies, provide effective practical teaching technical support for anesthesiology teaching, meet the needs of professional students in anesthesia practice learning, and solve the construction deficiencies of practical resources in school. Overall, the application of virtual reality technology in the anesthesia course can effectively promote the development of teaching and achieve significant improvements in the overall teaching quality.

2. Application status of virtual reality technology in anesthesia teaching

2.1 Lack of construction of virtual simulation courses and technology foundation for application

At present, the application of virtual reality technology is of great significance for the development of professional anesthesiology teaching. However, in actual teaching, there are still some deficiencies in the construction of virtual simulation courses for the anesthesiology major, such as lacking a virtual simulation course system for anesthesiology and failing to apply virtual reality technology to anesthesia experiments or set up appropriate experimental scenes, etc. In this case, the application of virtual reality technology lacks proper foundation and conditions to achieve effectiveness in anesthesiology teaching.

2.2 Lack of corresponding technical infrastructure construction and supporting resources related to virtual reality

To realize the application of virtual reality technology in the anesthesiology course, it is necessary to build relevant virtual simulation laboratories equipped with required hardware and software facilities. Combining the construction of virtual simulation laboratories and medical specialty laboratories can lay the technical foundation for anesthesiology Application. However, in the process of constructing virtual simulation laboratories, some universities do not have sufficient funds and resources to support the construction, therefore, the amount of virtual simulation laboratories is insufficient and there is a lack of integration with the construction of corresponding medical laboratories. The facilities of the simulation laboratory are not complete so that it is difficult to meet the experimental needs of students.

2.3 Teachers' experience and operation of virtual simulation technology is insufficient

One of the outstanding problems in the implementation of virtual simulation experiments in the anesthesiology major is that professional teachers have insufficient application experience for virtual simulation technology, as well as the limited practical ability for virtual simulation laboratories and related equipment. For most teachers, virtual simulation technology is a relatively new concept so that they have little chance of practice. Therefore, it is normal to lack the application experience of the new teaching technology. To realize the application of virtual simulation technology in the teaching of anesthesiology, it's a must to start from improving the technology application ability of teachers.

3. Strategies for the application of virtual reality technology in anesthesiology

3.1 Optimizing the virtual reality curriculum system of anesthesiology to promote teaching reform and development

Virtual reality technology is one of the important technologies in simulation teaching. For teachers, this technology and its related equipment certainly have a sense of freshness that many teachers are not familiar with the new tech. For this reason, it's necessary for teachers to improve their abilities in the application of virtual reality technology to deepen their understanding of the virtual simulation projects and play an active guiding role in carrying out subsequent experiment teaching. The academic affairs office of colleges and universities should further strengthen the construction of national virtual simulation gold courses, help teachers to accurately grasp the requirements, and provide effective guidance for the School and National Level Course construction. It's meaningful in the research of virtual simulation in the undergraduate education, medical professional 3D virtual simulation, promotion of medical development, selection and construction of innovative virtual simulation experiments, the establishment of VR industry technology research institutes in vocational and technical colleges, the training of virtual simulation talents, etc. to promote development in the teaching of anesthesiology.

3.2 Improving the construction of virtual reality infrastructure to lay an effective teaching foundation

In the experiment teaching of anesthesiology, it is inevitable to touch upon high-risk, high-cost, and high-consumption cases, etc. In this case, the use of virtual simulation experimental teaching can effectively solve this problem. Thus, colleges and universities should give full play to the school 's academic advantages, actively utilize the R & D and technical capabilities of cooperative enterprises, fully integrate the school's experimental teaching resources, as well as pay attention to the feasibility, rationality, and scientificity of the construction of virtual simulation experimental teaching center. Besides, it's also important to carry out the application work strictly in accordance with the national level of the virtual simulation experiment teaching center.

In order to apply virtual reality technology to anesthesiology teaching experiments, it is necessary to build related virtual simulation laboratories and supporting facilities. The construction of virtual simulation laboratories should adhere to the guidance of scientific planning, sharing resources, highlighting key points, improving efficiency, and sustainable development. The idea is to improve the innovative spirit and practical ability of medical students in an all-round way with the sharing of high-quality and information-based experimental teaching resources as the core, to build a batch of demonstrating and leading virtual simulation experimental teaching center and continue to promote the construction of experimental teaching information, and finally to promote the reform and innovation of anesthesiology experimental teaching.

3.3 Strengthening the training of teachers to enhance their technical teaching and application abilities

In response to the current insufficient abilities of virtual reality technology for anesthesiology teachers, it is necessary to further strengthen the training of professional teachers in the application of virtual reality technology. For example, the zSpace virtual reality machine as a new emerging in recent years has been favored by teachers and students for its features of free movement of scenes, content visualization, environment virtualization, ease of manipulation, and experience of reality. Using the zSpace virtual reality equipment in the teaching process can help students intuitively understand and overcome difficulties. By learning virtual reality technology and applications, anesthesiology teachers will be familiar with the interface, functions, and operation methods of "zSpace Virtual Reality AIO Machine". By carrying out the "zSpace" Training, it helps anesthesiology teachers to complete experiments that are difficult to operate in reality, such as experiments related to dangerous drugs and feeling the structure and effects of drugs, which can help students have a more intuitive experience, and enrich the anesthesiology class.

4. Conclusion

The application of virtual simulation technology in anesthesiology teaching has many advantages. It is necessary for relevant institutions to grasp the difficulties faced by the current application of anesthesiology virtual reality technology and take active measures to promote virtual reality technology to play an active role in anesthesiology teaching.

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