

Application of virtual simulation technology in stomatology education

Xiaobo Gao

1. Philippine Christian University, Manila 1004, Philippine

2. Chifeng Municipal Hospital, Chifeng 024099, Inner Mongolia

Abstract: Traditional stomatology education mainly relies on field operation, clinical practice and teacher explanation, but due to the limited teaching resources and certain limitations of teaching itself, many students can not get enough practice opportunities. Traditional education methods have been unable to meet the needs of training modern stomatology talents. Teachers need to accelerate the innovation of ideas and methods in the field of stomatology education to provide students with a better learning field. Based on this, this paper first analyzes the development of virtual simulation technology teaching and its application advantages in stomatology education, and then discusses its application strategies based on teaching practice experience, in order to provide references for peers.

Key words: virtual simulation technology; Stomatology; Education; Application strategy; advantage

The development of virtual simulation technology provides a new practice scheme for the innovation of stomatology education. It can not only simulate real treatment scenes, so that students can carry out practical operations on the simulator, but also simulate various cases, so that students can better understand the diagnosis and treatment of various diseases, which plays an important role in deepening their understanding of stomatology knowledge and improving their skills and abilities. Teachers should pay full attention to the various possibilities provided by the development of virtual simulation technology for the innovation of stomatology education, and conduct multidimensional exploration of its application strategy.

1. Development of virtual simulation technology teaching

The rise of virtual simulation technology has injected new vitality into the field of education. This innovative teaching method not only breaks through the limitations of traditional teaching, but also shows great potential in improving students' learning experience, practical operation ability and training innovative thinking. Virtual simulation technology is to provide students with vivid and realistic learning experience by simulating real scenes and environments. It enables students to conduct experiments in a virtual environment, so as to learn and master knowledge safely and effectively. Many front-line teachers reflect that this teaching method can not only enhance students' learning interest and motivation, but also improve the teaching effect while reducing the loss of experimental equipment and reducing teaching costs. In recent years, virtual simulation technology teaching has been widely used at home and abroad. In China, many universities and vocational colleges have established virtual simulation laboratories to actively explore and practice this new teaching method. In foreign countries, the development of virtual simulation technology teaching is more mature, and has formed a complete industrial chain, providing valuable experience and reference for the global education community. However, the development of virtual simulation technology teaching still faces some challenges. For example, how to ensure the fidelity and accuracy of virtual simulation experiment, how to solve the difference between virtual simulation experiment and actual operation and so on. In this regard, teachers need to continue to research and explore, improve the virtual simulation technology teaching theory system and practical application.

2. Application advantages of virtual simulation technology in stomatology education

With the continuous development of science and technology, virtual simulation technology has become an important tool in stomatology education. Virtual simulation technology provides a realistic simulation environment and operational experience, so that students can learn and practice in the simulated real scene, thus reducing the cost of stomatology education implementation, and improving its quality and efficiency. First of all, virtual simulation technology can provide highly realistic simulation environment and operation experience. Stomatology is a highly practical subject, which needs a lot of practical operations to improve the level of skills. Virtual simulation technology can simulate the real oral environment and tooth model, so that students can perform various operations in the simulated environment, such as tooth cleaning, cavity filling, tooth extraction and so on. This realistic simulation environment and operating experience can help students better understand and master the knowledge of stomatology and improve their skills. Second, virtual simulation technology can provide repeatable and adjustable learning opportunities. Oral medicine requires fine skills and complex operations, and virtual simulation technology can provide students with repeatable and adjustable learning opportunities. Students can practice and try repeatedly in a simulated environment, and constantly adjust the operation methods and skills, so as to improve their skills. At the same time, virtual simulation technology can also make intelligent adjustments according to students' learning situation and feedback, and provide personalized learning programs. Third, virtual simulation technology can reduce the cost of oral medicine education. Traditional oral medicine education needs a lot of physical equipment and human support, and the cost is high. The virtual simulation technology can simulate the real clinical scene through the combination of software and hardware, without consuming a lot of physical resources and funds, and can also provide students with a safer and more reliable practical operating environment. Finally, virtual simulation technology can improve the efficiency and quality of oral medicine education. Traditional oral medicine education needs a lot of time and

manpower investment, but virtual simulation technology can provide a lot of simulated environment and operating experience in a short time, shortening the learning cycle. At the same time, virtual simulation technology can also provide timely feedback and guidance to help students better grasp knowledge and skills, improve the learning effect and quality.

3. Application strategy of virtual simulation technology in stomatology education

3.1 Simulate virtual patients to improve doctor-patient communication ability

In today's healthcare environment, good doctor-patient communication is critical for doctors. However, traditional teaching methods often fail to provide enough practical opportunities for students to become proficient in this skill. In order to solve this problem, teachers can strengthen the application of virtual simulation technology, using its technical advantages to simulate virtual patients, and help students improve doctor-patient communication skills. For example, teachers use virtual simulation technology to create a simulated medical environment in which students play the roles of doctors and patients. By interacting with virtual patients, students can better understand the needs and feelings of patients and improve their compassion and patience. At the same time, the virtual patient can also simulate a variety of different diseases, symptoms, bad emotions, so that students can more comprehensively understand how to deal with a variety of different medical situations. Compared with traditional role simulation teaching, simulating virtual patients has many advantages. First of all, it can simulate various types of oral diseases, so that students can communicate with different diseases and broaden their horizons. Secondly, virtual patients can simulate real pain and discomfort, so that students can better understand the feelings of patients and cultivate their compassion and patience. Finally, virtual simulation technology can also provide timely feedback and assessment to help students understand their strengths and weaknesses in doctor-patient communication. In oral medicine education, teachers can use the advantages of virtual simulation technology to guide students to interact with virtual patients and practice doctor-patient communication skills repeatedly, so as to master effective communication skills with patients and better adapt to the current medical work environment.

3.2 Simulate dental surgery to improve practical operation ability

Virtual simulation technology can create realistic dental surgery scenes, including patient models, surgical instruments, surgical procedures, etc., so that students can practice in a simulated environment. This simulation environment is safe and economical, and can be used repeatedly, so that students can practice at any time, any place, is an important tool to develop students' practical operation ability. In oral medicine education, teachers can strengthen students' practical operation ability by simulating dental surgery. First of all, the teacher should simulate the whole process of dental surgery on the computer through virtual simulation technology, including the examination of patients, diagnosis, treatment plan formulation, and the specific implementation of surgery. In the virtual environment, students can personally operate surgical instruments built with virtual simulation technology to perform simulated surgical treatment. This way of learning has a high sense of reality and immersion. Students seem to be in a real operating room, facing virtual patients, carrying out real surgical operations. This not only enables students to better understand the whole process of dental surgery, but also helps them to improve their operational skills in practice and enhance their understanding and application of theoretical knowledge. Secondly, teachers should give real-time feedback and record students' operation through virtual simulation teaching system, and guide them to reflect on and improve their own operation combined with relevant teaching data. The students' simulated operation process was observed, and the students' operation skills were evaluated by combining the information recorded by the virtual simulation teaching system, and then corresponding guidance was given, which effectively improved the pertinence and effectiveness of oral medicine education and teaching.

3.3 Simulate dental treatment to improve knowledge application ability

Simulated dental treatment is a method that uses computer technology and virtual reality technology to simulate the real dental treatment process. Through simulated therapy, students can practice in a simulated environment and experience the process of applying their knowledge to the actual treatment of dental diseases, helping to improve their clinical skills and the application of professional knowledge. During the implementation of oral medicine education, teachers should simulate dental treatment in combination with real patient cases, and guide students to apply their knowledge to diagnosis and treatment in a virtual environment. On the one hand, this learning experience can help students master the basic knowledge of tooth structure and dental treatment, as well as tooth cleaning, filling, extraction and other processes. On the other hand, it can help students to combine theoretical knowledge learning with practice, improve the ability to use the knowledge to treat oral diseases and deal with sudden problems in the treatment process. It is an important direction of dental education reform to provide students with more interactive opportunities through simulated dental treatment, so that students can actively participate in the learning process and better grasp the knowledge. This teaching model allows students to try new techniques and methods in a safe environment without any risk to real patients, not only accelerates the development of their ability to apply professional knowledge, but also reduces the possibility of students making mistakes in clinical practice, and can improve their self-confidence and self-efficacy.

3.4 Simulate patients' symptoms to improve disease diagnosis ability

Accurate diagnosis of disease is a vital skill for medical students. However, traditional clinical teaching methods are often limited by limited resources and do not provide adequate opportunities for medical students to experience and recognize the symptoms of various diseases. Therefore, teachers need to introduce virtual simulation teaching to improve students' disease diagnosis ability by simulating patients' symptoms. The core of this teaching model is to allow medical students to diagnose in a virtual environment by simulating the symptoms of patients. It can effectively improve the diagnostic ability of medical students and reduce the pressure brought by traditional clinical teaching. For example, it can support students to understand "patient symptoms" through physical examination, questioning, analyzing test data, and so on, allowing students to make mistakes, learn and practice in a safe environment, so as to improve their diagnostic

thinking and skills. In order to improve the teaching effect, teachers can simulate the clinical manifestations of patients through the simulation teaching system, such as pain, fever, gingival atrophy and other symptoms, so that students need to use the knowledge and skills they have learned to accurately identify and evaluate these symptoms and complete the disease diagnosis. This teaching approach not only enhances students' sensitivity and recognition of oral disease symptoms, but also helps them understand the complexity and diversity of oral diseases. In addition, the virtual simulation teaching system can also analyze the diagnosis process of students, help teachers and students to form a clearer understanding of the learning progress, and provide an important reference for teachers to adjust the teaching progress and students to improve the learning method.

Peroration

The rise of virtual simulation technology is a major change in the education field. With its unique advantages and great potential, it is changing people's cognition and understanding of education. Especially in oral medicine education, virtual simulation technology has significant application advantages and potential. It can provide highly realistic simulation environment and operating experience, provide repeatable and adjustable learning opportunities, reduce the implementation cost of stomatology education, improve the efficiency and quality of stomatology education. With the continuous development of science and technology, the application of virtual simulation technology in stomatology education will be more and more extensive and in-depth. Teachers should combine the development characteristics of virtual simulation technology in teaching, strengthen the innovation of its application strategy, and scientifically use it to simulate virtual patients, dental surgery, dental treatment and patient symptoms, so as to break through the limitations of this teaching technology and the existing teaching mode, and realize the full play of its technical advantages.

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About the author: Xiaobo Gao(1982-), male, born in Chifeng, Inner Mongolia, associate chief physician, master candidate, PhD candidate, mainly engaged in clinical dentistry, education and scientific research.