

Exploration and practice of digital technology in oral virtual simulation teaching under the background of “Internet +”

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Abstract: The teaching task of stomatology in colleges and universities not only includes the basic theory content, but also includes the training of clinical practical ability. Teachers need to carry out practical teaching to guide the students to transition from students to clinicians. Among many practical training methods, virtual simulation technology arises at the historic moment under the drive of Internet technology, and becomes an emerging teaching method, which can create a virtual simulation world, so that students can obtain clinical operation experience, with interactive, simulation and other characteristics. However, in the actual teaching, how to maximize the advantages of virtual simulation technology, comprehensively improve the quality of talent training, is still the majority of teachers to explore the topic. Based on this, this paper explores oral virtual simulation teaching under the background of “Internet +”, in order to discuss effective improvement strategies with teachers.

Key words: Internet; Digital technology; Stomatology; Virtual simulation teaching; Practice inquiry

Oral clinical medicine is a professional and practical discipline with strong, not only requires students to master solid medical theoretical knowledge, but also requires them to have strong practical ability, in order to provide high-quality medical care services for oral patients. Therefore, in the teaching, teachers need to create a simulation of oral diagnosis and treatment environment for students, maximize the restoration of the environment of the oral clinic and the patient’s condition, so that students can skillfully carry out oral surgery. Under the background of the rapid popularization of Internet technology, virtual simulation technology provides a strong support for oral teaching in colleges and universities. It can provide a virtual simulation platform for students to help them practice using various medical equipment and oral diagnosis and treatment technology.

1. Application advantages of virtual simulation technology in oral teaching

First of all, virtual simulation technology can create an environment closer to clinical situation for teaching. The virtual simulation platform can create different diagnosis and treatment scenes to create immersive texture for students, so that they can also experience the real diagnosis and treatment process in the learning process, and train their diagnosis and treatment thinking. With the help of virtual simulation technology, students majoring in stomatology can better learn professional knowledge and apply it to the diagnosis of oral diseases, effectively improving their clinical resilience.

Secondly, the virtual simulation platform breaks the restrictions of time and space, and creates an online open and shared internship platform for students, so that students can learn independently, and practice activities are free from the restrictions of physical teachers and learning equipment, so that students’ learning activities are more flexible and diversified.

Finally, all the scenes and equipment provided by the virtual simulation platform are virtual with the help of the computer, and do not need a lot of physical support. Compared with the traditional teaching mode, it saves more teaching resources. In addition, the virtual simulation platform can also record students’ learning achievements and generate e-learning evaluation results. It does not require teachers to spend a lot of time in setting standards and preparing for exams, but only needs to input relevant information to track and evaluate with intelligent technology.

2. Analysis of the existing problems in oral virtual simulation teaching

(1) The virtual simulation operation tends to be stylized and simplified

At present, in order to meet the needs of students’ practical operation, the university where the author works has set up some simulation practical training projects, which are in the stage of exploration and trial. Through observation, the author found that the current virtual simulation practical training teaching, limited by the complex environment and conditions of oral clinical practice, can not completely and truly restore the actual situation of oral clinical practice, and gradually appeared the problem of stylized and simplified operation. If effective strategies can not be adopted to improve it, the virtual simulation technology will be limited to play a role, but also affect the students’ self-breakthrough. This problem is the inevitable problem in the application of virtual simulation platform to carry out teaching, but it also needs teachers to pay enough attention to find out effective strategies as soon as possible.

(2) There is still room for improvement in the convenience of virtual simulation equipment

Compared with previous teaching, virtual simulation technology opens a new situation for oral teaching, which is no longer limited to experimental equipment and teaching environment. However, through the practical application, we found that the virtual simulation platform still has a large room for improvement, which can bring more convenient services for teachers and students. For example, most of the virtual simulation equipment is no longer large equipment, but compared with the current information development of education, it is still not “small”. According to the characteristics of learning and teaching at the present stage, developers can develop virtual imitation operation software on

computers, tablets and even mobile phones, so as to provide students with more convenient learning services and improve the utilization rate of virtual simulation platform.

(3) The virtual simulation teaching model needs to be innovated

Under the support of Internet technology, the combination of virtual simulation technology and oral teaching has realized the integration of virtual and real teaching, and the current interactive feedback tends to be good. On the whole, it has enriched students' learning methods to a certain extent, and also made their practice more diversified and convenient. However, to give full play to the advantages of virtual simulation platform, teachers need to change their teaching thinking, in order to further improve the teaching effect as the goal, and really give full play to the advantages of virtual simulation teaching. Therefore, when using the virtual simulation platform to carry out teaching, teachers need to pay attention to combine the corresponding teaching strategies, and strive to maximize the application advantages of the virtual simulation platform.

3. Practical strategies of oral virtual simulation teaching under the background of "Internet +"

(1) Build a virtual experiment system with the help of virtual simulation technology

The virtual simulation technology is applied to build the virtual-real integration experimental teaching system, which organically combines virtual training with real teaching, so as to achieve the effect of virtual auxiliary teaching entity. Taking the teaching of adjacent jaw cavity preparation as an example, adjacent jaw cavity preparation is an essential professional skill for stomatologists. In the teaching, teachers can build the virtual process of oral diagnosis and treatment with the help of virtual technology, so as to achieve the effect of cultivating students' clinical thinking. At the same time, with the help of physical training, practical teaching AIDS can be connected on the simulated head shape to create a real human environment, so as to achieve the effect of training students' hand operation ability. In teaching, according to the learning needs, the teaching content is divided into several learning plates, organic integration of theoretical knowledge and virtual operation process. The basic knowledge is designed according to the reasonable arrangement of the teaching syllabus, and the case training section sets the receiving, inquiry, clinical examination, imaging examination, etc., which completely simulates the receiving process of the oral clinic.

In this design, students can strengthen the virtual system of theoretical knowledge through virtual simulation projects, and develop clinical thinking with the help of virtual simulation platform, familiar with the work flow of dentists, master the operation points and key links of dental preparation. With the aid of the virtual simulation platform, students can choose the appropriate diagnosis and treatment instruments, so that students can fully grasp the key points of operation in each link. In addition, students can use the knowledge they have mastered through the virtual simulation platform to carry out practical operation exercises with the aid of the adjacent face-hole molds distinguished by blue color, transfer the theoretical knowledge they have mastered to practical operation exercises, and truly experience the hand feel of grinding teeth and the fine movements of hand operation in human mouth, thus deepening their familiarity with various kinds of oral diagnosis and treatment instruments. In addition, if students have not reached the level of proficiency, teachers can encourage them to practice repeatedly after class, give full play to the convenience of virtual square simulation technology, reuse various oral patient scenes, deepen students' understanding of difficult content, strengthen their diagnosis and treatment ideas and practical operation ability.

(2) Use of virtual simulation technology to reduce the cost of practical operation

In the practical application, teachers can give full play to the advantages of virtual simulation technology to create virtual scenes, reduce the cost of oral equipment, and actively organize students to practice the content with high cost and complex operation technology. For example, denture implantation is an oral diagnosis and treatment operation to repair missing teeth, which requires implantation in the alveolar bone of the missing tooth area of the mouth, which can significantly improve the chewing function of patients. However, due to the high cost and complex operation technology, the teaching cost is high. At the same time, it is not guaranteed that all stomatological students can master this technology, which brings certain difficulties to the teaching of denture implantation and restoration. With the help of virtual simulation platform, teachers can solve this problem well.

For example, the computer imaging function of the virtual simulation platform is used to construct planting nails, healing caps and transfer rods, etc., which are operated and controlled by the mouse, and then completed in accordance with the real denture planting process, so that students can achieve the effect of mastering operational skills. In the actual teaching, the author also introduced the video operation when leading the students to carry out the virtual operation, so that the students could have a preliminary understanding of the whole process of denture implantation from the third perspective, and lay the foundation for the subsequent virtual operation practice. After watching the video, the author then led the students to operate on the computer. Through the scene constructed on the virtual simulation platform, the mouse was used as the scalpel to complete the difficult operations such as trimming alveolar bone and lifting maxillary sinus in the virtual mouth. In the practice, many students have operation failure, then the virtual simulation system does not directly enter the next link, but continue to complete the link of the operation, until the students get qualified level. On the whole, the combination effect of virtual simulation platform and denture implant is more concept, which saves teaching cost to a large extent, and provides students with the opportunity to practice repeatedly, which effectively solves the teaching problem of this link.

(3) The use of virtual simulation technology, the construction of oral case resource database

The virtual simulation platform is an intelligent platform built with the help of computer technology. It can not only simulate the virtual consulting room and virtual laboratory, but also has a powerful information reserve function, which can store the patient data of different dental diseases. In teaching, teachers can organize students to practice different oral diagnosis and treatment techniques, and also use the

materials in the resource library to allow students to carry out personalized exercises. At the same time, teachers can combine real oral disease diagnosis and treatment procedures, construct patient information, and completely simulate real clinical diagnosis and treatment procedures.

For example, in the section of hand fineness exercise, while training students' hand, machine and drilling needle control ability, students' mistakes will also be marked to form a list of learning outcomes information. Similarly, in the exercises of hole preparation, pulp opening training and crown bridge preparation, teachers can also establish a resource base with the help of virtual simulation platform. And students can according to their own shortcomings, targeted to select modules, need to improve and improve the place for repeated practice, so as to achieve the purpose of improving the training effect.

On the other hand, in the later clinical teaching process, In cooperation with Shenzhen Yorktal Digital Medical Imaging Technologies Company to develop Three-dimensional visualization technology visualization technology, 3dvt), is applied to the 3D imaging reconstruction of head and neck tumors, and builds the first 3D imaging database of head and neck tumors in China. This database can be applied to undergraduate students and students' practical teaching, combining with the theoretical knowledge of books, to effectively improve the teaching effect.

(4) Combine virtual simulation technology, reform the teaching evaluation system

Under the application of virtual simulation technology, the evaluation of oral teaching in colleges and universities can be improved from two aspects: one is the assessment method, the other is the assessment content, including theoretical assessment and operational assessment. In the actual teaching, we have applied the virtual simulation system to record students' operation data and track students' operation throughout the whole process. With the help of virtual platform, the training effect of students can be evaluated objectively and accurately. Teachers and students can review relevant three-dimensional operation records back, and the system will also give special prompts for key operation steps. This way of assessment is not only convenient, but also has a high accuracy of evaluation results, which can reduce teachers' work pressure. In terms of assessment content, teachers can also understand students' subjective feelings after using the method of question and answer, so as to compare with the traditional teaching model, the characteristics of the virtual-real integration model, process assessment, suggestions and other aspects of assessment. From the evaluation results, we can understand the application of the virtual simulation experiment platform, and then adjust the practical operation practice content and class arrangement. In terms of evaluation methods, teachers can also integrate students' mutual evaluation and self-evaluation to enrich the teaching subject, so as to give a comprehensive and objective evaluation. For example, in the student operation, other students can look on and organize students to make comments after the operation. First, organize students to evaluate themselves, let them reflect on their own operation process, so that they can realize their shortcomings, so as to adjust their mentality to better complete the operation practice, and then let the students evaluate each other, say the existence of improper operators.

Conclusion

In summary, with the extensive application of Internet technology, the integration of virtual simulation technology and stomatology teaching will be deeper and deeper, which will promote the reform and development of college stomatology teaching. In the actual teaching, teachers can carry out virtual simulation teaching activities in real time and enrich the teaching content through multimedia technology such as video and virtual case in the teaching class. In daily teaching, make full use of virtual simulation technology, organize students to carry out online practice, simulation operation, improve students' clinical thinking ability.

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