



# Research on the construction of role playing experiential teaching mode in TCM medical record training teaching based on virtual simulation technology

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**Abstract** .With the help of virtual reality technology, the role playing experiential teaching mode is applied to the practical teaching of TCM medical records. Through the immersive role experience in virtual reality environment, students are physically and mentally involved and feel the sense of career mission. Compared with traditional teaching, the role-playing experiential teaching mode in virtual simulation situation has better satisfaction with teaching. This teaching method effectively improves students' thinking ability and skill level of TCM, increases their interest in learning and efficiency, strengthens their professional responsibility and improves the teaching effect of clinical practice.

**Keywords:** virtual simulation; Role-play; Experiential teaching mode; TCM practical training teaching

## 1 Introduction

Training excellent TCM talents is the fundamental goal of TCM colleges and universities. Traditional Chinese medicine is an empirical discipline, and good clinical practice ability and thinking ability of traditional Chinese medicine need long-term practice and continuous accumulation to form. Training a qualified TCM doctor requires a lot of clinical practice or practical training. In traditional teaching, due to the scarcity of typical clinical cases and the limitation of time and space, the outstanding contradiction between students' clinical practice requirements and patients' privacy protection consciousness leads to the lack of clinical practice and poor hands-on ability of students, which seriously restricts the quality of TCM practice teaching and the training of TCM talents. The rapid development of information technology has changed students' learning habits and stimulated the reform of teaching forms .<sup>[1]</sup> Virtual simulation technology is a new means of human-computer interaction created by computer and the latest sensor technology, using computer simulation to produce a three-dimensional virtual world, providing users with visual, auditory, tactile and other sensory simulation, so that users can be immersive, can observe events in three

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degrees of space in time, without restrictions, with immersion, interaction and imagination. And other characteristics.

## **2 The general idea of applying virtual simulation technology to TCM practical training teaching platform**

With the goal of cultivating students' clinical decision-making ability of TCM, according to the training requirements of TCM talents, the immersion and interactivity of virtual simulation, artificial intelligence and other technologies are utilized to enable students to play a role in the virtual learning environment and fully devote themselves to the learning environment, making up for the shortcomings of traditional practical teaching. The teaching situation is presented in the form of three-dimensional visualization, which is very conducive to the cultivation of students' professional quality and the improvement of skills training.

Role-playing teaching model comes from American sociologists Fanny Schefter and George Schefter's "Role-playing about Social Values", which belongs to the teaching model with experience as the main form in a specific structural situation. The research group applied this teaching mode to the practical training teaching of traditional Chinese medicine, allowing students to experience both the role of doctor and the role of patient, and to obtain immersive feelings through the dual experience. Through the different perspectives of the experience, students can think and feel, so as to reconstruct the connection of the medical knowledge they have learned, the harmony of the doctor-patient relationship and the assessment of their own clinical ability. Compared with traditional teaching mode, role-playing experiential teaching can increase students' interest in learning, increase medical students' understanding of life concept, increase medical students' sense of responsibility and mission of their own career, and more effectively improve students' doctor-patient communication etiquette and enhance doctor-patient communication ability. Through independent learning, students can experience one-to-one simulated medical treatment scenarios, and then through group exploration, discussion and collaboration, they can better apply the theory to clinical practice and cultivate a complete clinical diagnosis and treatment thinking, which has certain social and practical characteristics. Most importantly, this teaching method helps train medical students to be more thorough and comprehensive in clinical diagnosis and differential diagnosis. <sup>[2]</sup>

By consulting a large number of literatures, combining theories and years of teaching experience, the research group has continuously summarized and refined the "role playing experiential teaching mode" in the practical teaching of TCM medical records, so as to achieve an effective combination of role deduction and knowledge imparts, and make a comparison with the traditional teaching mode. The exploitability and superiority of the flipped classroom teaching mode of role-playing experiential teaching in the practical training teaching of TCM medical records were verified through literature research, investigation and comparison, which provided a new theoretical and practical basis for improving the quality of TCM practical training teaching and promoting the innovation of TCM teaching mode.

### **3 The operation of the role-playing experiential teaching mode in the practical training teaching of TCM medical records under the virtual reality environment**

#### **3.1 Select research objects.**

In the fifth semester of TCM major of Changchun University of Chinese Medicine in 2019, the students were divided into experimental group using virtual simulation teaching and control group using traditional teaching, with 56 students in each group, 27 boys and 29 girls in the control group, 23 boys and 33 girls in the experimental group.

#### **3.2 Specific teaching methods.**

Specific teaching methods. Unified teaching materials: Chinese Medicine Internal Medicine 3rd edition of the general Higher education Chinese Medicine "13th Five-Year Plan" teaching materials (Shanghai Science and Technology Press), each unit of the course according to the practical training syllabus teaching content. Control group: Traditional teaching mode was adopted, mainly taught by teachers, combined with blackboard writing, multimedia and other equipment. Experimental group: Role-playing experiential teaching mode was adopted by computer: virtual simulation, multimedia database and other technical means were used to construct virtual diagnosis and treatment operation scenarios through classic clinical cases. Through 3D virtualization technology, the real hospital consulting room is transformed into an operable practical training class. Students conduct simulation exercises online in the first person to experience the clinical diagnosis scene in the hospital. The role of patient or doctor. Play the role of doctor or patient in a virtual learning environment to simulate clinical cases. The virtual "standardized patient" player should read the script of the medical record, deduce the specific disease and simulate the clinical case. The doctor role will consult the students who play the patient online, simulate the doctor-patient treatment process, and make clinical diagnosis by looking, smelling, asking and cutting out the diagnosis and treatment ideas, and carry out the corresponding differential diagnosis, give the treatment plan, and complete the writing of the medical record.

The virtual simulation teaching group is an immersive experience highlighting the role, and the clinical cases are vividly represented through the form of 3D virtual reality. Other details of specific teaching: Take sweating syndrome of common diseases in life as an example: (1) Provide medical records: Patient Wang Mou, male, 54 years old, sweating for more than 1 month, conscious of awkward abnormal life, affecting life and work, symptoms can be seen always sweating, dry mouth, fatigue, hot flusher, pale tongue, white and greasy fur, pulse string slippery. The medical records prepared should be based on clinical real medical records, with TCM connotation and characteristics of TCM syndrome differentiation. (2) Select a student to act as a standardized patient before class, through the "standardized patient" training, highlight the patient's discomfort, pain and inconvenience of life, vivid interpretation,

other students in turn act as a doctor to consult standardized patients, standardized patients should be immersed in the interpretation of patients, at the same time can deeply understand the pain of patients, (3) highlight the key points: At the end of the course, each student has experienced the interpretation of the dual identities of patients and doctors, and the interpretation of different roles allows students to think in different roles: For example, when I am in the role of a patient, I hope that how the doctor will diagnose and treat, how the doctor will be more comfortable, and how the doctor will explain the condition will make me feel satisfied, which can cultivate the students' consultation skills, cultivate the ability of clinical diagnosis and treatment ideas, cultivate humanistic feelings and cultivate the professional responsibility. (4) Group cooperation: After consulting each group one by one, all team members discuss and study to form a complete medical record, and write a practical training report. (5) Guidance and comment: Randomly selected a student to collect medical history, give their own clinical syndrome differentiation ideas, and give the diagnosis and treatment of the disease, each group will evaluate each other, and finally the teacher will summarize and comment. (6) Function: Through immersive simulation of patients, this teaching method can not only comprehensively understand the disease, but also obtain the patient's perception through their own experience, and better consider the needs of patients. Only when they become doctors can they solve the problems of patients, and then simulate doctor-patient communication through groups and teams to improve humanistic care, increase the perception of life outlook, and enhance their sense of mission and responsibility.

### 3.3 Teaching evaluation.

After the end of the semester, questionnaires were issued for investigation and evaluation, including teacher evaluation of students, students' satisfaction with teaching effect and evaluation methods such as examinations. Students' grades, TCM thinking ability, skill level, medical record writing, innovative consciousness, learning interest and attitude, career planning and other aspects were compared with traditional teaching groups, so as to clarify the teaching effect.

### 3.4 Data statistics.

The score data of students were collected, the questionnaires for comprehensive ability evaluation and teaching satisfaction evaluation of students were sorted out, and statistical analysis was carried out by SPSS software. The counting data were represented by  $n(\%)$ , the measurement data by mean  $\pm$  standard deviation ( $\bar{x}\pm s$ ), and the  $t$  test was adopted.  $P < 0.05$  indicated statistical significance

By comparing the comprehensive ability assessment of the two groups of students. The test scores, TCM thinking ability, skill level and medical record writing of the experimental group were higher than those of the control group ( $P < 0.05$ ). (See Table 1).

**Table 1.** Comparison of comprehensive ability assessment between the two groups of students

Group	results	Chinese Medicine thinking ability	skill level	medical record writing
Control group	84.4±7.3	81.3±6.5	82.1±4.9	87.5±5.1
Experimental group	88.8±8.2	87.1±6.9	87.9±6.6	91.5±5.3

Comparison of two groups of students' evaluation of teaching mode. The experimental group was superior to the control group in innovation consciousness, interest in improving learning efficiency and career planning, with statistical significance ( $P < 0.05$ ). (See Table 2)

**Table 2.** Comparison of students' evaluation of teaching mode between the two groups

Group	Innovation consciousness ability	Improve learning efficiency	Learning interest	Career planning
Control group	37(74)	33(66)	36(72)	33(66)
Experimental group	47(94)	43(86)	44(88)	42(84)

## 4 Conclusion

The deep integration of virtual simulation technology and medical practical training teaching system makes up for the shortcomings of traditional teaching mode and breaks through the limitation that medical students' practical training must be done on patients. However, as the representative of Chinese traditional culture, TCM has extensive and profound connotation and integrates philosophical speculation, which makes it more difficult to use modern information technology to carry out virtual simulation teaching that can reflect the characteristics of TCM.

### 4.1 Virtual simulation experiment gives students a sense of being immersive and enhances the fun of learning.

Compared with the control group, the learning interest and learning atmosphere are significantly increased. Virtual simulation experiments can incorporate a variety of lively humanistic elements and ideological and political content according to the characteristics of courses and students, which can not only avoid the safety problems that may be brought by the real scene, but also enrich the content of comprehensive practice, and effectively enhance the practical ability and professional competency of students. Compared with the control group, the experimental group has significantly improved its performance. At the same time, the combination of after-school and offline group-based classroom discussion can make up for the lack of students' discussion and teachers' face-to-face guidance in virtual simulation experiments.<sup>[3-5]</sup>

#### **4.2 The virtual simulation experiment is based on the Internet platform and can realize the free conversion of time and space by using Internet technology.**

Virtual simulation experiment can allow students to freely choose learning time and learning progress according to their own needs, and realize independent learning. Compared with the control group, the learning effectiveness of the experimental group was significantly improved. It can restore the real scene to the maximum extent, support the reasonable evaluation mechanism on the PC side, and closely integrate with the clinic. Virtual patients can serve the majority of medical students based on the development and changes of real clinical conditions.<sup>[6-7]</sup>

#### **4.3 The virtual simulation experiment adopts the form of scenario simulation and enables the learners to master the skills of collecting medical history data by observing, listening, inquiring and consulting standardized patients through online interaction.**

After the four diagnoses, through syndrome differentiation analysis and prescription selection, the students' learning of TCM disease diagnosis, syndrome differentiation classification, treatment prescription selection, and mastery of TCM classic theory basis are considered. Emphasis is placed on training the skills and thinking of TCM classics in clinical application. The differences between the results of learners' operation and the standard process of the system are given in each link. Through the comparison mode of experts, learners can find the gaps, learn repeatedly, and master traditional Chinese medicine thinking and clinical skills.<sup>[8-10]</sup>

To sum up, this teaching mode not only arouses the enthusiasm of students in learning, but also increases the interest of practical training classes, taps the potential of students, improves the comprehensive quality, and lays a foundation for the role of clinicians in the future. It aims to cultivate students' rigorous awareness of medical diagnosis and treatment, respect for life and humanistic care for patients. The exploitability and superiority of the doctor-patient dual role experiential teaching mode in the practical teaching of TCM medical records were verified through literature research, investigation and comparison, providing theoretical and practical basis for improving the quality of TCM teaching and promoting the innovation of TCM teaching mode.

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