International Education Forum, 2026, Volume 4, Issue 3
http://ojs.bbwpublisher.com/index.php/IEF
Online ISSN: 2981-8605
Print ISSN 3083-4902

Countermeasures Research on the Application of Scenario Simulation Teaching Method in Local Anatomy Education

Qing Li, Xuanyu Chen, Yun Gao, Wei Huang*

Haiyuan College of Kunming Medical University, Kunming 651701, Yunnan, China

**Author to whom correspondence should be addressed.*

Abstract: *Objective:* To explore the application value of Scenario-Based Learning (SBL) in local anatomy teaching. *Methods:* A total of 94 clinical medicine students of Grade 2025 from a medical college were selected as research subjects and randomly divided into two groups: the conventional group (n=47) and the research group (n=47). The conventional group adopted traditional teaching methods for local anatomy teaching, while the research group used the scenario simulation teaching method. The exam scores, excellent rate, and learning effects of the two groups were compared. *Results:* The exam scores, excellent rate, and learning effects of the research group were significantly higher than those of the conventional group, with statistically significant differences ($P < 0.05$). *Conclusion:* The scenario simulation teaching method can not only effectively improve the teaching quality of local anatomy courses but also enhance students' analytical ability, practical operation ability, craftsmanship spirit, and learning ability, which is conducive to promoting the high-quality development of medical education.

Keywords: Scenario simulation teaching method; Local anatomy; Teaching countermeasures; Teaching effect

Online publication: March 31, 2026

1. Introduction

The scenario simulation teaching method is a teaching approach based on simulating real situations. It creates realistic learning scenarios and assigns diversified tasks, including core links such as role-playing and case simulation, aiming to enable students to master knowledge and skills through practice, thereby improving teaching quality. This method is more in line with the needs of clinical medicine teaching: it constructs teaching scenarios based on real cases, guiding students to analyze illness conditions, pathology, and discuss treatment plans in the scenarios, thus enhancing their thinking and practical abilities. Local anatomy serves as a bridge connecting systematic anatomy with clinical diagnosis and treatment. It helps students master knowledge such as human local structures and clinical applications, laying a solid foundation for subsequent surgical operations,

clinical physical examinations, and disease diagnosis teaching. Therefore, teachers of clinical medicine majors in colleges and universities should actively adopt the scenario simulation teaching method. Taking real clinical diagnosis and treatment scenarios as blueprints, they can use VR technology, typical cases, and other means to create immersive teaching situations, allowing students to learn local anatomy knowledge and surgical operation skills in the scenarios, thereby improving the teaching quality of local anatomy and cultivating more virtuous and talented clinical medicine professionals.

2. Materials and methods

2.1. General information

The research subjects were 94 clinical medicine students of Grade 2025 from a medical college. All students were admitted through the summer college entrance examination, in good health without disabilities, and voluntarily participated in this study. They were randomly divided into two groups: the conventional group and the research group, with 47 students in each group. The average age of the conventional group was 19.5 ± 1.15 years, and that of the research group was 19.5 ± 1.05 years. There were no statistically significant differences in age, educational background, or other aspects between the two groups ($P > 0.05$).

2.2. Teaching methods

The conventional group adopted traditional teaching methods for local anatomy courses, such as wall chart explanation, multimedia video explanation, and teacher operation videos, to teach theoretical knowledge, including the structures and anatomical methods of the abdomen, thorax, neck, and head, interspersed with relevant surgical cases for practical training [1]. Additionally, group cooperative learning was carried out in the conventional group: 47 students were divided into 6 learning groups, and group anatomical experiment tasks were assigned with clear anatomical operation specifications to further improve students' practical operation abilities in local anatomy experiments.

The research group adopted the scenario simulation teaching method, which was divided into five teaching links. Clinical local anatomy cases were compiled according to the teaching content, and clinical diagnosis and treatment scenarios were created with the help of microlectures and real cases to stimulate students' enthusiasm for independent learning and encourage their active participation in teaching [2].

Refine key teaching points and make teaching preparations: Teachers analyzed the teaching content of local anatomy courses to clarify key and difficult points, compiled case data (detailing patients' onset scenarios, vital signs, clinical symptoms, past medical history, and allergy history), and integrated theory with practice through cases. Taking the abdominal anatomy unit as an example, teachers could compile cases of appendicitis and cholecystitis, carefully produce microlectures to clarify the location, structural characteristics, and typical symptoms of the appendix and gallbladder, and guide students to conduct a comprehensive analysis of the cases [3].

Diversified introduction of new course content to stimulate learning interest: Teachers produced microlectures based on the compiled cases to introduce basic case information and assign role-playing tasks, helping students quickly understand the patients' conditions and enter the clinical diagnosis and treatment scenarios. In addition, teachers designed question chains according to the case content to stimulate students' exploration enthusiasm and guide them to integrate relevant knowledge points, laying a good foundation for

subsequent role-playing and experimental teaching in local anatomy.

Organize group cooperative learning activities to guide in-depth learning: 47 students were divided into 6 groups, with 7–8 students in each group. Each group included students with poor, medium, and excellent academic performance to ensure intra-group heterogeneity and inter-group homogeneity, and a group leader was elected for each group [4]. Furthermore, teachers scientifically designed role-playing tasks, including roles such as patients, nurses, resident doctors, attending surgeons, and anesthesiologists, guiding each group to reasonably assign roles, clarify patient diagnosis standards, formulate clinical treatment plans, and perform the consultation and treatment process through role-playing. During this process, teachers provided on-site guidance, promptly answered questions raised by each group, and helped them improve their group cooperative learning plans. Finally, teachers encouraged each group to take turns explaining the case analysis process, treatment plans, relevant knowledge points of local anatomy, surgical precautions, etc., promoting communication among different groups, activating the classroom atmosphere, and thus improving the teaching quality of local anatomy courses [5].

Strengthen anatomical operation practice to improve practical abilities: Teachers first demonstrated the operational steps of appendectomy, explained the key points of each step, and answered students' questions about the angle and depth of the scalpel incision, allowing them to understand the surgical anatomy steps and providing sufficient practice time [6]. Students could practice appendectomy using human abdominal models, accurately locate the appendix, master the appropriate angle, depth, and strength of the incision, achieve precise and safe resection of the necrotic appendix, improve surgical quality, and enhance patients' prognosis.

Improve summary and evaluation methods to enhance teaching quality: Teachers evaluated the learning process of each group and students' practical operation processes in local anatomy experiments, pointed out problems existing in group cooperative learning and students' practical operations, and put forward relevant suggestions to help students adjust their learning methods, thereby improving their learning effects in local anatomy [7].

2.3. Observation indicators

Three aspects were observed for both groups: exam scores, excellent rate and pass rate, and learning effects. First, exam scores included theoretical and experimental scores of local anatomy courses, with a full score of 100 points. Second, based on students' theoretical and experimental exam scores, the excellent rate and pass rate of the two groups were calculated. Third, learning effects were evaluated through a questionnaire survey using the Wenjuanxing app, where students self-assessed their teamwork ability, clinical operation ability, learning enthusiasm, clinical thinking, and independent learning ability [8].

2.4. Statistical methods

SPSS 25.0 statistical software was used for data analysis. Measurement data such as exam scores, excellent rate, pass rate, and teaching satisfaction were expressed as ($x \pm s$), and inter-group comparisons were performed using t-tests. Count data, such as the excellent rate were expressed as [n (%)], and inter-group comparisons were performed using x^2 tests. A P-value < 0.05 was considered statistically significant.

3. Results

3.1. Comparison of exam scores in local anatomy courses between the two groups

The exam scores of the research group were significantly higher than those of the conventional group, with statistically significant differences ($P < 0.05$), as shown in **Table 1**.

Table 1. Comparison of exam scores in local anatomy courses between the two groups

Group	Theoretical Score	Experimental Score
Conventional group (n=47)	83.25 ± 9.62	85.07 ± 9.32
Research group (n=47)	78.87 ± 10.14	73.56 ± 10.25
t-value	2.148	5.795
P-value	0.034	0.000

3.2. Comparison of excellent rate and pass rate between the two groups

The full score for both theoretical and experimental exams of local anatomy courses was 100 points, with scores above 80 points considered excellent and 60 points as the passing line. Summarizing the theoretical and experimental exam scores of the two groups, it was found that the excellent rate of the research group was significantly higher than that of the conventional group ($P < 0.05$), while there was no statistically significant difference in the pass rate between the two groups ($P > 0.05$), as shown in **Table 2**.

Table 2. Comparison of excellent rate and pass rate between the two groups

Group	Number of Cases	Excellent Rate	Pass Rate
Conventional group	47	29 (61.70%)	43 (91.49%)
Research group	47	19 (40.43%)	41 (87.23%)
x^2-value	-	4.257	0.448
P-value	-	0.039	0.504

3.3. Comparison of course learning effects between the two groups

The scores of clinical operation ability, learning enthusiasm, clinical thinking, and independent learning ability of the research group were significantly higher than those of the conventional group ($P < 0.05$), while there was no statistically significant difference in the score of teamwork ability improvement between the two groups ($P > 0.05$), as shown in **Table 3**.

Table 3. Comparison of course learning effects between the two groups

Group	Teamwork Ability	Clinical Operation Ability	Learning Enthusiasm	Clinical Thinking	Independent Learning Ability
Conventional group (n=47)	9.18 ± 3.03	9.57 ± 3.54	8.16 ± 2.25	9.44 ± 3.06	8.82 ± 2.03
Research group (n=47)	8.65 ± 2.04	7.41 ± 1.38	7.13 ± 1.08	7.31 ± 1.95	7.54 ± 1.51
t-value	0.995	3.897	2.829	4.024	3.468
P-value	0.323	0.000	0.006	0.000	0.001

4. Discussion

Local anatomy courses involve numerous knowledge points and heavy experimental tasks, requiring high clinical thinking, dialectical thinking, and practical abilities from students. To stimulate students' learning interest and help them master local anatomy knowledge, teachers should actively carry out scenario simulation teaching, carefully design clinical cases and role-playing teaching plans, and use microlectures and virtual simulation technology to create realistic clinical diagnosis and treatment scenarios. This stimulates students' enthusiasm for independent learning, encouraging them to independently analyze cases, discuss treatment plans, and strictly standardize the anatomical steps of local areas such as the neck, abdomen, and thorax, laying a solid foundation for improving their clinical surgical operation abilities [9]. This study shows that the scenario simulation teaching method can effectively improve students' learning effects. For example, with the help of scenario simulation teaching, the experimental and theoretical scores of the research group were significantly higher than those of the conventional group, and the excellent rate was also higher ($P < 0.05$). This indicates that the scenario simulation teaching method can improve students' learning effects of theoretical knowledge, experimental operation abilities, clinical thinking, and independent learning abilities in local anatomy courses, and is worthy of further promotion. Based on the research results, this paper proposes the following application countermeasures of the scenario simulation teaching method in local anatomy teaching [10].

4.1. Adhere to clinical case orientation and create realistic teaching scenarios

Teachers of clinical medicine majors in colleges and universities should actively communicate with internship instructors to understand the surgical requirements of different departments, collect typical cases, further optimize the scenario simulation teaching plan, and then create realistic teaching scenarios through microlectures to guide students to explore new knowledge in the scenarios. First, starting from basic local anatomy concepts and structural characteristics, teachers can use microlectures to create basic scenarios, such as the anatomical positioning of superficial cervical lymph node palpation and the anatomical layers of upper limb venous puncture. Combining cases, they can explain the anatomical steps and operational key points of different parts, helping students quickly master superficial lymph node anatomy and upper limb venous puncture surgical skills, and improving their clinical thinking and practical abilities [11]. Second, teachers can create comprehensive scenarios, designing cross-site and multi-system clinical diagnosis and treatment scenarios that integrate knowledge points of local anatomy, surgical operations, and clinical medicine to further improve students' learning effects. For example, teachers can create a diagnosis and treatment scenario of "emergency laparotomy for closed abdominal injury", guiding students to use CT, ultrasound, and color Doppler ultrasound to examine the patient's abdominal condition, focusing on observing the liver, spleen, and intestines, enabling them to quickly clarify the patient's condition and treatment methods, and improving their comprehensive abilities in knowledge integration, anatomical positioning, and clinical decision-making [12].

4.2. Build a virtual simulation experimental platform to improve experimental teaching quality

First, colleges and universities should introduce virtual simulation technology, VR glasses, AR helmets, and other equipment to build a trinity local anatomy teaching platform of "physical anatomical specimens + simulated models + virtual simulation systems." This creates an immersive learning environment for students, deepens their understanding of local anatomy knowledge, and improves their local anatomical operation

abilities. For example, schools can purchase high-fidelity human models and specialized operation models, create virtual surgical models of the thyroid gland, mammary glands, and abdomen, allowing students to perform anatomical operations on the models to master anatomical skills and improve their comprehensive abilities [13]. Second, schools can build a virtual simulation anatomy teaching system, using virtual reality (VR) and augmented reality (AR) technologies to create anatomical scenarios of the head, neck, abdomen, and thorax, intuitively displaying human organ structures, lymph nodes, blood vessels, and nerve tissues, and realizing the integration of "virtual anatomical operations + clinical scenario simulation" to facilitate students' online virtual operations. With the help of the virtual simulation anatomy teaching system, students can repeatedly practice local anatomical operations and simulate clinical surgical approach design, improving their individual surgical operation abilities.

4.3. Optimize the internship teaching model and cultivate a "dual-qualified" teaching team

Colleges and universities should strengthen the construction of the teaching team for clinical medicine majors, hire hospital experts as internship instructors to participate in on-campus local anatomy teaching, and regularly organize teachers to take temporary positions in hospitals to improve their clinical practice abilities. For example, schools should regularly arrange teachers to study in hospital departments such as surgery, emergency medicine, and hepatobiliary surgery, allowing them to participate in emergency first aid, patient physical examinations, and clinical surgeries, improving teachers' surgical abilities and medical ethics, and laying a solid foundation for deepening the teaching reform of local anatomy [14]. In addition, schools should hire hospital experts as part-time teachers to participate in scenario simulation teaching of local anatomy, integrate typical clinical cases into teaching, guide students in local anatomy practice, correct problems existing in their anatomical processes, and cultivate students' spirit of excellence, pursuit of perfection, respect for life, and teamwork, thus cultivating more outstanding medical talents [15].

In conclusion, the scenario simulation teaching method can not only effectively improve the teaching quality of local anatomy, help students master theoretical knowledge of local anatomy, and enhance their experimental operation abilities, but also assist students in mastering skills such as physical examination, medical image analysis, and clinical surgical operations, effectively improving their independent learning abilities. It is worthy of wide promotion in clinical medicine education.

Disclosure statement

The authors declare no conflict of interest.

References

[1] Li GC, Sun ZX, Li ZL, et al., 2025, Practical Effect of Scenario Simulation Combined with Heuristic Discussion Teaching Method in Anatomy Teaching. Life Science Instruments, 23(3): 110–112.

[2] Chen Y, Wang ZD, Jiao DJ, et al., 2023, Application of Scenario-Based Case Discussion in Experimental Teaching of Local Anatomy. China Health Industry, 20(13): 9–12.

[3] Zhang JF, Wu FM, Guo GQ, 2020, Teaching Practice of Local Anatomy with Simulated Surgery as the Carrier. Medical Education Research and Practice, 28(1): 92–94 + 98.

[4] Gao LG, Yang PB, Yang WN, et al., 2024, Preliminary Exploration on the Construction of Short Videos for Local Anatomy Teaching in the Digital Age. Basic Medical Education, 26(11): 963–968.

[5] Wu YF, 2024, Effect of Scenario Simulation Teaching Method in Local Anatomy Teaching. Reflexotherapy and Rehabilitation Medicine, 5(21): 195–198.

[6] Zhao ZW, Li Z, Feng X, 2024, Application of the Dual-Teacher Teaching Model in the Integrated Course of Local Anatomy and Histology and Embryology. Chinese Journal of Anatomy, 47(5): 450–452.

[7] Liu F, Chen YL, Zhang X, et al., 2024, Application of Cloud Class Combined with Live Teaching in Online Teaching of Local Anatomy. Chinese Journal of Anatomy, 47(5): 455–457.

[8] Zhao Q, Liu W, Zhang HM, et al., 2024, Exploration of a Combined Teaching Model of Cross-Sectional Imaging Anatomy and Local Anatomy Based on Case-Based Learning. Chinese Medical Journal of Peking Union Medical College Hospital, 15(5): 1217–1223.

[9] Wang Q, Guo C, Qin GH, et al., 2024, Exploration and Practice of the "Three-Module" Teaching Method in Abdominal Local Anatomy Teaching. Journal of Gansu University of Chinese Medicine, 41(4): 101–104.

[10] Wang HB, Zhang HD, Li FJ, et al., 2022, Application of Simulated Surgery-Blended Teaching Method in Experimental Teaching of Local Anatomy for Excellence Classes. China Higher Medical Education, 2022(5): 98–99.

[11] Gong JG, Liu P, Deng XF, et al., 2024, Application of Blended Teaching Model Under the OBE Concept in Local Anatomy. Journal of Snake, 36(2): 246–249.

[12] Wang JK, Shen R, Zhang L, et al., 2023, Exploration and Practice of Intelligent Teaching of Local Anatomy Based on Digital Educational Resources. China Medical Education Technology, 37(5): 596–599.

[13] Gan JF, Lian CR, Ling YW, et al., 2023, Exploration of Flipped Classroom Teaching Practice of Local Anatomy Oriented to Improving Students' Post Competence from the Perspective of New Medical Science. Technology Wind, 2023(14): 25–27.

[14] Shao YP, Liu B, Zhang Y, et al., 2022, Effect Analysis of the Trinity Teaching Model of Systematic Anatomy Based on the Network. Journal of Henan Medical College, 34(3): 360–364.

[15] Hu M, Feng GF, Dong WJ, et al., 2022, Exploration and Practice of Scenario Simulation Teaching Method in Curriculum Ideology and Politics of "Human Anatomy". China Medical Education Technology, 36(3): 338–341 + 346.