ISSN: 3008-1629

Research on Ideological and Political Education in Higher Vocational Nursing Anatomy Course Based on the "Three Combinations and Three Forms" Approach

Hui Wang[1], Yuemin Teng[2], Meng Ye[1*]

[1]Department of Basic Medicine, Shanghai Sipo Polytechnic, Shanghai 201399, China

[2] Shanghai Publishing and Printing College, Shanghai 201300, China

First author, E-mail: wanghui2010@163.com

[*] Corresponding author, E-mail: 295132911@qq.com

Abstract

Objective: To explore the construction and effectiveness of ideological and political education in the histology and embryology curriculum for higher vocational nursing students based on the "Three Combinations and Three Forms" approach. Methods: A total of 303 nursing students from the 2024 autumn cohort were randomly selected as participants. Evaluations were conducted before and after the teaching intervention, focusing on students' self-directed learning ability, critical thinking skills, course engagement, final theoretical exam scores, and teaching satisfaction.

Results: The results showed that 97% of students completed all teaching materials, with an average score of (83.09 ± 5.48) on the Digital Human STEM 7.0 platform. The final theoretical exam scores averaged (86.70 ± 6.87). Post-intervention, students demonstrated significant improvements in self-directed learning abilities—including learning motivation, self-management, collaborative learning, and information literacy—with statistically significant differences ($P < 0.05$). Similarly, critical thinking skills, encompassing truth-seeking, open-mindedness, analytical ability, systematization, confidence in critical thinking, intellectual curiosity, and cognitive maturity, showed statistically significant enhancements ($P < 0.05$). Additionally, 97% of students expressed high satisfaction with the curriculum. Conclusion: The "Three Integrations and Three Modes" teaching design effectively increased students' learning interest and engagement, improved their self-directed learning and critical thinking abilities, and received positive feedback. This study demonstrates that the innovative approach holds significant promotional value for ideological and political education reform in history and embryology courses, providing a valuable reference for higher vocational nursing education.

Key words

Histology and Embryology; Curriculum Ideology and Politics; Three Integrations and Three Modes; Inquiry-Based Teaching; Higher Vocational Nursing Education.

Higher vocational nursing education not only requires the cultivation of nursing talents with professional skills, but also needs to focus on the cultivation of their medical humanities and professional ethics. The "Opinions on Strengthening and Improving Ideological and Political Work in Colleges and Universities under the New Situation" emphasizes that ideological and political education should be integrated into the entire process of education and teaching. Based on the teaching design of "three inclusions and three styles", that is, to integrate morality into teaching, to integrate morality into teaching, to integrate emotion into teaching, as well as various teaching modes such as inquiry-based, project-based, and group-based, it can effectively integrate ideological and political education into professional knowledge teaching

ISSN: 3008-1629

[1]-[2] , improve students' comprehensive quality and medical professional ethics, and meet the requirements for the cultivation of medical talents in the new era. With the continuous advancement of educational technology, the application of advanced teaching tools such as the Digital Human STEM7.0 platform has provided strong support for the implementation of the "three inclusions and three styles" characteristic teaching. These tools not only make anatomical knowledge more intuitive and easy to understand, but also enrich teaching methods through a combination of online and offline methods, stimulate students' interest in learning, and improve teaching effectiveness [3]-[4] . At the same time, tapping into ideological and political teaching materials, such as current news and case videos, can also keep pace with the times to meet the learning needs of young people. The current teaching trend emphasizes student-centeredness, practical teaching and ability training. The teaching design based on "three-in-one and three-style" allows students to learn and grow in the process of problem solving through problem-oriented and project-driven methods, and cultivates their critical thinking, teamwork and innovation capabilities. This is in line with the training goals of higher vocational education and the development trend of medical education. To this end, it is an effective way to improve the quality of higher vocational nursing talent training and strengthen medical humanities education to sort out the key points of implementing the ideological and political education of higher vocational anatomy courses based on the characteristic teaching design of "three-in-one and three-style". It aims to deeply explore the construction path and effectiveness of the ideological and political education of higher vocational anatomy courses based on the characteristic teaching design of "three-in-one and three-style", provide strong support for the ideological and political reform of higher vocational nursing education, and also open up new ideas for the realization of "three-dimensional education".

1. Exploration of ideological and political education in the course of anatomy and embryology based on the characteristic teaching design of "three metaphors and three styles"

1.1. The overall framework of the ideological and political system of the course

1.1.1 Deep integration of ideological and political issues and professional knowledge In course design, we adopt a problem-oriented strategy and carefully construct a series of problem chains involving ideological and political issues such as medical ethics and the value of life. These questions, such as "the relationship between anatomy and bioethics" and "how to show respect and care for patients in medical practice", are intended to stimulate students' curiosity and achieve a dual improvement in professional knowledge and moral education through the process of problem solving. At the same time, specific ideological and political teaching goals are set for each core knowledge point to ensure the organic integration of ideological and political education and professional teaching, and form a teaching system that emphasizes both knowledge and morality.

1.1.2 Innovation of the “Three Implications” of Ideological and Political Teaching Content (1) Implication of morality in teaching: In courses such as “Anatomy, Histology and Embryology”, by describing the complex process of life formation, the great discoveries in medical history and the dedication of scientists, we guide students to think deeply about the value and meaning of life and cultivate their professional ethics of cherishing life and caring for patients. (2) Implication of morality in teaching: Integrate the core socialist values into teaching, emphasize the importance of teamwork and collectivism by analyzing the structure and function of the human body, encourage students to establish lofty ideals of serving the society and the country, discuss ethical issues in the field of life sciences, and enhance students’ moral judgment and social responsibility. (3) Implication of emotion in teaching: Integrate humanistic care and emotional education into teaching, such as setting up a “life education” session, through a

ISSN: 3008-1629

moment of silence ceremony, life inheritance stories, etc., to inspire students to cherish family and affection, and to look forward to and be proud of their future role as doctors.

1.2. Diversified exploration of ideological and political teaching methods and models

1.2.1 Smart teaching that integrates online and offline teaching. Advanced teaching tools such as the Digital Human STEM7.0 platform are used to realize smart teaching that integrates online and offline teaching. In the online part, students' learning interest is stimulated by publishing preview materials and guiding questions. Offline, 3D models, virtual dissection and other functions are used to intuitively display anatomical knowledge, and ideological and political connotations are explained in combination with actual cases, forming a new teaching paradigm that complements each other online and offline.

1.2.2 Inquiry-based and project-based teaching combines the development of medical ethics and anatomy, and guides students to deeply explore the ethical issues behind anatomical knowledge through playing documentary videos and organizing project research, so as to cultivate their professional ethics and social responsibility. At the same time, project-based teaching focuses on specific topics, such as "the ethical boundaries of embryonic development and the mysteries of life", and encourages students to gain a deep understanding of scientific principles and ethical challenges through literature review, experimental observation, etc.

1.2.3 Group-based and critical thinking teaching Organize students to discuss the application of anatomical knowledge in medical practice and ethical considerations, and learn to balance medical technology and ethics through group discussions. At the same time, organize students to debate on the topic of "Conflict and Integration between Technological Development and Medical Ethics" to cultivate their rational thinking, objective analysis and critical thinking abilities.

1.2.4 Autonomous learning and personalized support Relying on the online platform, through the integration of "element combination", "topic embedded" and "finishing touch" of "three-in-three-style" characteristic curriculum ideological and political education, students are provided with a rich anatomical knowledge base, ethical cases and online discussion opportunities, and diversified evaluation is carried out to cultivate their autonomous learning and communication abilities. At the same time, teachers carry out personalized teaching interventions based on the student learning data collected by the Digital Human STEM7.0 platform, such as providing targeted tutoring materials, setting additional learning tasks, etc., to ensure that each student can get the most suitable teaching support for themselves, so that students can deeply understand the ideological and political concepts such as life ethics and medical ethics, and internalize them into personal values.

1.3. Operational logic and continuous improvement of the construction of the curriculum ideological and political system

The above parts together constitute the ideological and political system of nursing anatomy courses based on the "three-inclusion and three-style" characteristic teaching design. This system starts from the deep integration of ideological and political topics and professional knowledge, and realizes the effective penetration of ideological and political education through diversified teaching methods and models. At the same time, we pay attention to the objective evaluation of ideological and political elements in grade assessment, enrich the second classroom, and timely conduct teaching reflection and teaching research activities through supervision, teacher-student investigation and feedback, forming a closed-loop continuous improvement strategy.

Specifically, the operation logic of the curriculum ideological and political system can be summarized as follows: with "three metaphors and three styles" as the core concept, through a

ISSN: 3008-1629

variety of teaching methods and models such as online and offline integrated smart teaching, inquiry-based and project-based teaching, group-based and critical thinking teaching, and autonomous learning and personalized support, the deep integration of ideological and political education and professional teaching is achieved. On this basis, through the evaluation of ideological and political elements in grade assessment and teaching reflection and research activities, the teaching content and methods are continuously optimized, the teaching effect is improved, and a complete logical closed loop of the construction and operation of the curriculum ideological and political system is formed. The specific teaching cases are shown in Table 1:

Table 1 Cases of ideological and political implementation in higher vocational anatomy courses based on the characteristic teaching design of "three meanings and three styles"

Unit Name	Knowledge Points	Integration of Ideological and Political Thought	Fusion means
Anatomy and clinical chapters of the musculoskeletal system	This unit covers the anatomical structure, physiological functions and interrelationships of the main components of the musculoskeletal system, such as bones, muscles and joints, as well as the clinical manifestations, diagnostic methods and treatment principles of common musculoskeletal diseases.	Through the study of the anatomy of the musculoskeletal system, students are guided to understand the exquisiteness and harmony of the human body structure and cultivate the concept of respecting life and awe of nature; combined with clinical cases, the importance of medical ethics and professional ethics is emphasized, and students are cultivated with a sense of responsibility and mission, as well as the spirit of contributing to the medical cause and human health.	Element combination + case study
Chapter on the anatomy and clinical features of the internal organs	This unit introduces in detail the structural characteristics, physiological functions, interrelationships and roles of visceral organs such as the digestive system, respiratory system, urinary system, reproductive system and cardiovascular system in maintaining body homeostasis. At the same time, it discusses the pathogenesis, clinical manifestations, diagnostic techniques and treatment methods of visceral diseases.	Through the study of visceral anatomy, students are guided to understand the complexity and delicacy of life activities and cultivate respect and care for life; combined with clinical cases, the importance of preventive medicine is emphasized, and students' health awareness and social responsibility are cultivated; by exploring the relationship between medical technology and ethics, students are guided to establish correct professional ethics and cultivate the heart of a doctor.	Element combination + exploration
Chapter on Vasculature	This unit mainly covers the anatomical structure, physiological functions and	Through the study of vascular system anatomy, students are guided to understand the	Inquiry + case study

ISSN: 3008-1629

	interrelationships of the cardiovascular system and lymphatic system, including the location, morphology and structure of the heart, the classification, distribution and course of blood vessels, and the composition and return pathways of lymphatic vessels. At the same time, it discusses the clinical manifestations, diagnostic methods and treatment principles of vascular system diseases such as atherosclerosis, hypertension and lymphedema.	importance of blood circulation and lymphatic circulation in maintaining life activities, and to cultivate the concept of cherishing life and caring for health; combined with clinical cases, the importance of preventing cardiovascular diseases is emphasized, and students are cultivated to have a healthy lifestyle and self-care awareness; by exploring the relationship between medical technology and ethics, students are guided to establish correct professional ethics and sense of responsibility.	
Chapter on Sensory Organs	This unit mainly covers the anatomical structure, physiological functions and roles of the visual, auditory, balance, olfactory and taste organs in the human body's perception of the external environment. At the same time, it discusses the clinical manifestations, diagnostic methods and treatment principles of sensory organ diseases such as myopia, otitis media and olfactory dysfunction.	Through the study of sensory organ anatomy, students are guided to understand the subtlety and complexity of the human sensory system and cultivate awe and respect for life; combined with clinical cases, the importance of preventing sensory organ diseases is emphasized, and students are cultivated with healthy living habits and self-protection awareness; by exploring the impact of sensory organ diseases on the quality of life of patients, students are guided to establish a professional ethics of caring for others and serving the society.	Inquiry + case study
Anatomy and clinical chapters of the nervous system	This unit covers the basic components of the nervous system in detail, including the anatomical structure, physiological functions and mutual connections of the central nervous system (brain and spinal cord) and the peripheral nervous system (sensory nerves, motor nerves and autonomic nerves). At the same time, it also discusses in depth the clinical manifestations, diagnostic basis and treatment strategies of	Through the study of nervous system anatomy, students are guided to understand the core role of the nervous system in regulating human life activities, thereby cultivating a deep respect and cherishment for life; combined with clinical cases of nervous system diseases, the importance of preventing nervous system diseases and early intervention is emphasized to cultivate students' health awareness and self-care ability; at the	Element formula

ISSN: 3008-1629

	common diseases of the nervous system such as stroke, Parkinson's disease and epilepsy.	same time, by exploring the rehabilitation and social support of patients with nervous system diseases, students are guided to establish a professional ethics of caring for vulnerable groups and actively engaging in social services.	
Anatomy and clinical chapters of the endocrine system	This unit elaborates on the composition of the endocrine system, including the anatomical structure, physiological functions, and types and mechanisms of action of endocrine organs and tissues such as the hypothalamus-pituitary-target organ axis, thyroid gland, adrenal gland, and pancreas. At the same time, it also discusses the clinical manifestations, diagnostic methods, and treatment principles of common endocrine system diseases such as diabetes, hyperthyroidism, and pituitary tumors.	Through the study of endocrine system anatomy, students are guided to understand the importance of the endocrine system in maintaining body homeostasis and regulating life activities, and to cultivate respect and cherishment for life; combined with clinical cases of endocrine system diseases, the importance of disease prevention and health management is emphasized, and students' health awareness and self-care ability are cultivated; at the same time, by exploring the impact of endocrine system diseases on patients' lives and work, and the role of the medical team in disease treatment, students are guided to establish the professional ethics of teamwork and caring for patients.	Discussion

2. Materials and methods

2.1. Data

2.1.1 General data A total of 175 2023 and 128 2024 higher vocational nursing students from the fall class of 2023 were randomly selected as the survey subjects . There was no difference in the students' admission scores, age, and gender composition ($P > 0.05$). The syllabus and teaching hours were the same, and there was only a difference in the teaching mode. The total hours of this course were 70 hours, including 48 hours of theoretical classes and 22 hours of experimental classes.

2.1.2 Observation indicators Before the course begins, students' autonomous learning ability and critical thinking ability are surveyed through the questionnaire star. After the course, students' autonomous learning ability, critical thinking ability, and "three-inclusion and three-style" teaching evaluation are surveyed through the questionnaire star. After the course, teachers assess students' theoretical knowledge and experimental operation. The final comprehensive score = theoretical test paper score * 60% + experimental operation score * 40%.

ISSN: 3008-1629

2.1.3 Statistical analysis SPSS 25.0 statistical software was used for statistical analysis. The measurement data were expressed as mean ± standard deviation ( ), and the count data were expressed as number of cases and percentage. The comparison before and after teaching was performed using t -test, and $P < 0.05$ was considered statistically significant.

2.2. Methods

2.2.1 Pre-class guidance and material integration (1) Problem-oriented pre-study material design: In the pre-class preparation stage, teachers need to carefully design a series of questions closely related to ideological and political issues such as medical ethics and the value of life, such as "How to reflect life ethics in anatomical practice?" and publish these guiding questions through online platforms, accompanied by short video pre-study materials such as "Medical Ethics and Anatomy History". This not only requires students to preview professional knowledge, but also prompts them to think about the humanistic value of medicine in advance, and realize the "elemental combination" of professional knowledge and ideological and political education. At the same time , teachers should use AI technology to accurately label and classify teaching resources to ensure the timeliness and pertinence of materials, such as integrating current news, case videos, etc., to suit the interests of young people. (2) Pre-study tasks and thinking guidance: Clarify the pre-study tasks and guide students to think about relevant ideological and political issues around core knowledge points. For example, in the chapter "Embryonic Development and the Origin of Life", students are required to think about the meaning and value of life. By recording questions and confusions, students are prepared for in-depth discussions in class and cultivate their independent learning ability and critical thinking.

2.2.2 Classroom interaction and topic embedding (1) Inquiry-based learning and interactive discussion: In classroom teaching, an inquiry-based learning model is adopted, combined with video materials such as "Documentary of the Development of Medical Ethics and Anatomy", to guide students to deeply explore ethical issues in the acquisition and application of anatomical knowledge. Through impromptu questions, group discussions and other forms, students' curiosity and spirit of exploration are stimulated, and professional ethics and social responsibility are cultivated. At the same time, multimedia tools such as the Digital Human STEM 7.0 platform are used to make abstract concepts intuitive and enhance teaching effectiveness. (2) Project-based teaching and ethical practice: The project-based teaching model is implemented , such as the "Exploring the Ethical Boundaries of Embryonic Development and the Mysteries of Life" project, which requires students to conduct research and experimental observation in groups and submit project reports for classroom presentation. This process not only exercises students' scientific research ability and teamwork ability, but also deepens their understanding of ethical boundaries, reflecting the teaching concept of "teaching with morality" .

2.2.3 After-class consolidation and practical application (1) Learning outcome assessment and feedback: After class, teachers should use the Digital Human STEM 7.0 platform to publish targeted review materials and evaluate students' learning outcomes through tests, homework, etc. Pay special attention to students' ethical considerations in applying anatomical knowledge to medical practice, such as organizing "Medical Student Volunteer Service" activities to allow students to experience the benevolence of doctors in practice and enhance their sense of social responsibility. (2) Continuing education and humanistic care: Encourage students to participate in special seminars such as "Application of anatomical knowledge in medical practice and ethical considerations" and continuously deepen their understanding of medical ethics through group discussions, case analysis, etc. At the same time, use virtual reality technology to simulate the dissection process, guide students to think about the balance between technology and ethics, and cultivate professional qualities that emphasize both

ISSN: 3008-1629

innovation and humanistic care. Through continuous after-class education activities, ensure that students can continue to grow in the combination of theory and practice.

3. Results

3.1. Basic performance

3.1.1 Basic learning situation The data of the Digital Human STEM7.0 platform of the “Three Encompassments and Three Styles” characteristic teaching design show that most students can embrace the classroom, have a positive learning attitude , and show good integrated learning results. According to the statistics of the course management background, 100% of the students viewed the course announcements and chapter information, showing a high degree of attention. In the link of independent learning of teaching materials such as videos and courseware , 97 % of the students completed the browsing of all resources , and the total learning score of the Digital Human STEM7.0 platform was (89.09±5.48) points , showing the students' investment and attention to the “Three Encompassments and Three Styles” characteristic teaching . At the same time, the scores of task points, chapter tests and course discussions were (79.14±4.21), (96.41±6.18) and (17.63±5.79) respectively . Combining all the scores , the average total score of students in the Anatomy Histoembryology course was (91.70±3.32) , which reflects the good results of the application of the "three-inclusive and three-style" characteristic teaching design .

3.1.2 Final comprehensive results The students’ final comprehensive score was (86.70±6.87) , which further verified the solid results achieved by the students in their course learning.

3.1.3 Students’ autonomous learning ability before and after teaching After the teaching practice of anatomy and embryology with the characteristic teaching design of "three contents and three styles" , students' autonomous learning ability in learning motivation, self-management, learning cooperation and information literacy has been significantly improved. Compared with before teaching, the improvement in these aspects is statistically significant ($P < 0.05$), which fully demonstrates the positive role of the characteristic teaching design of "three contents and three styles" in improving students' autonomous learning ability (see Table 2) .

Table 2 Comparison of students' autonomous learning ability scores before and after teaching ($\bar{x} \pm s$, points)

Dimensions	Before teaching	After teaching	t	P
Learning Motivation	27.89±4. 12	29.00±3.80	3.447	0.001
Self-management	37.36±4.23	39.49±4.90	5.002	<0.001
Learning collaboration	16.54±3.05	17.76±2.27	5.586	<0.001
Information Literacy	19.75±2.42	twenty one .66±2.82	8.897	<0.001
Self-learning ability	104.84±10.26	107.91±11 .74	3.429	0.001

* $P < 0.05$ vs control group

3.1.4 Comparison of critical thinking ability scores before and after teaching After the characteristic teaching based on "three metaphors and three styles" , students' critical thinking ability has been significantly improved. Compared with before teaching, students showed higher levels in truth-seeking, open-mindedness, analytical ability, systematization ability, self-confidence in critical thinking, curiosity, and cognitive maturity, and these differences were statistically significant ($P < 0.05$). This shows that the anatomical histoembryology teaching based on the characteristic teaching design of "three metaphors and three styles" has a positive impact on students' thinking ability (see Table 3) .

ISSN: 3008-1629

3.1.5 Evaluation of student satisfaction Students' satisfaction with the anatomy, histology and embryology teaching based on the "three-inclusions and three-styles" characteristic teaching design was also very high. More than 97% of the students recognized the "three-inclusions and three-styles" characteristic teaching design model , proving the effectiveness and popularity of the newly constructed anatomy, histology and embryology teaching based on the "three-inclusions and three-styles" characteristic teaching design (see Table 4) .

Table 3 Comparison of students' critical thinking ability scores before and after teaching ($\bar{x} \pm s$, points)

Dimensions	Before teaching	After teaching	t	P
Seeking the Truth	31 . 96±4.85	33.79±5.71	4.601	<0.001
Open-minded	37 . 11±4.94	38.38±4.81	3.206	<0.001
Analytical skills	40.46±5.21	42.10 ± 4.13	4.294	<0.001
Systematization Capabilities	36.45±4 . 12	37.95±4.05	4.520	<0.001
Confidence in critical thinking	40.12 ± 3.56	41 . 69±3.94	5.147	<0.001
Curiosity	40.85±4.82	42.83 ± 4.61	5.168	<0.001
Cognitive maturity	35.89±6.24	37.36±6.98	2.733	<0.001
Critical thinking skills	267.14 ± 22.24	274.08±23.78	3.710	<0.001

* P < 0.05 vs control group

Table 4 Satisfaction with the characteristic teaching based on " three metaphors and three styles" [n(%), n=303]

project	Totally agree	Most agree	Basically agree	Disagree	Totally disagree
1. During the internalization and absorption stage, students can watch online learning platform videos and complete homework carefully.	72(23.8)	96(31 . 7)	117(38.6)	15(5.0)	3(1 . 0)
2. Watching videos and chapter tests can help you master the knowledge	76(25 . 1)	106(35.0)	104(34.3)	15(5%)	2(0.7)
3. Online learning platforms can help you monitor your learning progress	81(26.7)	94(31 . 0)	102(33.7)	21(6.9)	5(1 . 7)
4. Helps to improve learning interest	66(21 . 8)	78(25.7)	112(37.0)	42(13.9)	5(1 . 7)
5. Helps improve learning efficiency	67(22 . 1)	83(27.4)	114(37.6)	33(10.9)	6(2.0)
6. Helps improve the ability to obtain information	80(26.4)	90(29.7)	114(37.6)	16(5.3)	3(1 . 0)
7. Helps improve independent learning ability	77(25.4)	94(3 1. 0)	112(37.0)	16(5.3)	4(1 . 3)
8. It is conducive to improving classroom enthusiasm and initiative	62(20.5)	84(27.7)	117(38.6)	35(11 .6)	5(1 . 7)
9. Online learning platforms are more effective for after-class review	85(28 . 1)	84(27.7)	119(39.3)	12(4.0)	3(1 . 0)
10. Are you satisfied with anatomical histology and embryology?	116(38.3)	87(28.7)	89(29.4%)	9(3.0%)	2(0.7 %)

ISSN: 3008-1629

4. Discussion

4.1. Discussion on the effectiveness of the “three metaphors and three styles” characteristic teaching

Through the implementation of the characteristic teaching design of "Three Embeds and Three Styles" (embedding morality, teaching philosophy, and teaching emotion, combined with inquiry-based, project-based, and group-based teaching), the Anatomy Histoembryology course has achieved remarkable results. From the perspective of basic learning, students' participation is extremely high. Data from the Digital Human STEM 7.0 platform show that students' browsing rate of course announcements, chapter information, and teaching materials is close to or reaches 100%, and the overall learning performance is excellent, with an average score of (89.09±5.48) points, and the final comprehensive score also reached (86.70±6.87) points, which fully proves the effectiveness of the "Three Embeds and Three Styles" teaching method in improving students' knowledge mastery.

Further analysis showed that students achieved significant improvement in autonomous learning ability, especially in learning motivation, self-management, learning cooperation and information literacy, which showed statistically significant improvement compared with the pre-teaching period ($P < 0.05$) . This shows that the "three-in-one and three-style" teaching method not only imparts knowledge, but also stimulates students' intrinsic learning motivation, cultivates their self-management and teamwork abilities, as well as information acquisition and processing abilities, which is highly consistent with the goal of cultivating learners' self-orientation and critical thinking in deep learning theory.

In addition, students' critical thinking ability was significantly improved, and the scores of each dimension were higher than those before teaching, and the difference was statistically significant ($P <0.05$). This result shows that the "three-in-one and three-style" teaching method is also effective in promoting students' thinking development. In particular, through inquiry-based learning and project-based teaching, students learned how to ask questions, analyze problems, solve problems, and make judgments in complex situations, which reflects the core requirements of deep learning theory for the cultivation of high-order thinking skills.

The high scores of student satisfaction evaluation further verified the popularity and effectiveness of the "three-inclusion and three-style" teaching method. More than 97% of students approved of the teaching model and believed that it helped improve learning interest, learning efficiency, information acquisition ability and autonomous learning ability, and also helped to improve classroom enthusiasm and initiative. This is consistent with the research results on deep learning in courses such as infectious disease nursing [5] and obstetrics and gynecology nursing [6] . These positive feedbacks not only enhanced students' satisfaction with the course, but also provided strong support for the continuous deepening of ideological and political education in subsequent nursing education courses.

4.2. Recommendations

4.2.1 Deepen the intelligence of teaching resources and platforms and promote the construction of deep learning content. Deep learning theory emphasizes the importance of rich learning resources and intelligent learning environment for learners' knowledge construction [7] . This also supports the implementation of the "three-inclusion and three-style" teaching method. In the application process, teachers still need to rely on the creation of specific anatomical situations to optimize teaching resources. Not only should they introduce high-quality videos and cases, but they should also incorporate more ideological and political elements. For example , in the teaching of nursing anatomy, the practice of "three-inclusion and three-style" needs to rely on the support of intelligent teaching platforms. Suggestions: Add "nursing anatomy feature modules" to the digital human STEM7.0 platform, such as "anatomical

ISSN: 3008-1629

positioning related to clinical nursing operations", and use three-dimensional visualization technology to display the anatomical basis of catheterization, injection and other operations, so as to achieve "teaching with morality" - infiltrating the spirit of self-discipline and patient dignity awareness in skill training. Develop an "anatomy-nursing case interaction system". For example, when explaining the respiratory system, embed a virtual situation of "ARDS patient position management", requiring students to master the anatomy of the lung lobe while thinking about how to reflect the humanistic care concept of "teaching with emotion" through position adjustment. AI learning analysis technology is used to intelligently diagnose students' learning trajectories in the "vascular system" module. When it is detected that students do not have a good grasp of "venipuncture positioning", the micro-course "Ethics of Vascular Protection in Nursing Operations" is automatically pushed to achieve personalized penetration of "teaching through morality". At the same time, further exploration is needed in the in-depth application of digital resources, especially to strengthen the intelligent construction of the Digital Human STEM7.0 platform, use machine learning algorithms to achieve personalized learning path recommendations, and an intelligent question-answering system based on natural language processing, so as to accurately meet students' personalized learning needs and help them explore and learn in depth [8] .

4.2.2 Strengthen the practice link and innovation ability training, and deepen the deep learning experience . The deep learning theory advocates promoting the internalization of knowledge and the improvement of innovation ability through practice. Under the framework of the "three-in-one" teaching method, the practical teaching link should be further strengthened. Based on the characteristics of the nursing profession, it is recommended to build a "three-in-one" practical teaching system: Inquiry-based training: In the intramuscular injection training, students are not only required to accurately identify the anatomical position of the gluteus maximus, but also to explore the ethical considerations of "injection positioning for special populations (such as obese patients)" through role-playing, and cultivate the professional judgment of "teaching with morality". Project-based collaboration: Design a comprehensive project of "Prevention of Pressure Ulcers for Elderly Bedridden Patients". Students need to combine the anatomical knowledge of bone protrusions to make a protection plan, and reflect the communication strategy of "teaching with emotion" in the plan (such as empathy when explaining the principle of sacral compression to family members). Critical drill: Carry out "ethical debate on specimen use" before the anatomy experiment class, combining "the story of the body donor" (introduction to morality) with "the requirement of anatomical rigor" (introduction to morality) to strengthen the nursing staff's cognition of the value of life. At the same time, we should increase clinical internship opportunities so that students can exercise their clinical thinking in a real medical environment and achieve a deep integration of theory and practice [9] . In addition, we should encourage students to participate in scientific research projects and innovative activities, and cultivate their innovative consciousness and critical thinking through problem solving and teamwork, so as to lay a solid foundation for medical research and clinical practice.

4.2.3 Establish a long-term evaluation and feedback mechanism to support the continuous optimization of deep learning

Deep learning theory emphasizes the importance of continuous evaluation and feedback to learning outcomes. It is recommended to establish a long-term evaluation and feedback mechanism: Skill-ideological and political integration assessment: Set up an "anatomical application station" in the final platform assessment. For example, when assessing "nasogastric tube placement", not only the students' mastery of esophageal anatomy is assessed, but also the "ethical decision-making when encountering patients with esophageal varices" is required to achieve the practical test of "teaching with morality". Learning process tracking: Use platform big data to draw the "ideological and political growth curve" of students, such as analyzing the

ISSN: 3008-1629

quality of their speeches on the "vegetative nursing dilemma" in the "nervous system" chapter discussion area, and dynamically evaluate the internalization effect of "teaching with emotion". Clinical feedback connection: Cooperate with the internship hospital to develop the "Nursing Behavior Anatomy Traceability Evaluation Form", and the teaching teacher records the anatomical literacy and professional values embodied by students in real nursing scenarios, such as "whether they can accurately explain the anatomical basis of the chest pain location of myocardial infarction patients and give appropriate comfort" (emotional). Through regular questionnaire surveys, seminars, etc., we collect students' learning feedback and opinions to understand their satisfaction and needs for teaching content, methods, resources, etc. [10] . At the same time, we use big data and artificial intelligence technologies to conduct in-depth mining and analysis of learning data, identify problems and deficiencies in the learning process, and provide a scientific basis for teaching adjustments.

In summary, the "three meanings and three styles" reform of nursing anatomy is essentially to transform the structural cognition under the scalpel into the value navigation of nursing behavior. Through the intelligent platform, the penetration of "morality" is deepened, the expression of "emotion" is concretely expressed in nursing practice, and the guidance of "Tao" is strengthened in professional judgment, so as to cultivate new-era nursing talents who "know the truth and the reason", and make anatomy a real bridge connecting nursing technology and humanistic care.

Funded projects

2024 Shanghai Vocational and Technical College Course Ideological and Political Demonstration Course Teaching Master and Demonstration Course "Anatomy Histology" (kswh2024-xm09); 2024-2026 Planning Project of Shanghai Higher Education Society "Three Teachings" Reform Background of Nursing Anatomy Hybrid Teaching Design Innovation Research (1QYB24105); The Second Huang Yanpei Vocational Education Thought Research Project "Three Teachings" Reform Background of Nursing Anatomy Virtual Simulation Innovation Teaching Exploration (ZJS2024YB274)

References

[1] Gao Qinyan, Teng Yuemin. Telling the Chinese design story with "three metaphors and three styles": Exploring the path of ideological and political construction of visual communication design courses[J]. Journal of Beijing Institute of Graphic Communication, 2023, 31(04): 61-65. DOI: 10.19461/j.cnki.1004-8626.2023.04.004.

[2] Wang Zhen, Teng Yuemin. Course ideological and political teaching design based on the "three-inclusion and three-style" model: Taking "publication distribution practice" as an example [J]. Journal of Science and Education, 2021, (26): 101-103. DOI: 10.16400/j.cnki.kjdk.2021.26.034.

[3] Wang Hui, Ye Meng, Shen Xiaoping. Construction and exploration of anatomy, histoembryology courses for nursing majors under the background of digital transformation of vocational education [J]. Chinese Journal of Histochemistry and Cytochemistry. 2023, 32(04): 437-441.

[4] Li Lili. Application of multi-integrated teaching model based on "smart classroom" in diagnostic teaching[J]. Chinese Contemporary Medicine, 2022, 29(36): 173-176.

[5] Li Dongxiu, Hong Xia, Chen Tingyu, et al. Ideological and political teaching practice of "Infectious Disease Nursing" course based on deep learning theory[J]. Journal of Nursing, 2023, 30(14): 24-27.

[6] Zhao Qionglan, Li Hui, Wen Xiaohui, et al. Ideological and political teaching practice of "Obstetrics and Gynecology Nursing" from the perspective of " three main principles " [J]. Journal of Nursing, 2022, 29(16): 22-25.

[7] Chen Lan, Cui Ying. Observation on the effect of deep learning method in clinical internship teaching[J]. Chinese Health Industry, 2018, 15(15): 115-116.

ISSN: 3008-1629

[8] Guo Yan, Li Zhicheng. Exploration on the reform of teaching mode of human anatomy and physiology in higher vocational colleges under the background of digital education[J]. Modern Vocational Education, 2024, (10): 109-112.

[9] Zheng Yingying, Hu Qiannan, Lou Yangyun, et al . Application research of 3D digital cloud anatomy teaching platform based on physical specimens[J]. Health Vocational Education, 2022, 40(06): 64-65.

[10] Park Chunping. Exploration of smart teaching of internal medicine nursing based on deep learning[J]. Health Vocational Education, 2022, 40(23): 77-79.