

# Research on ideological and political application of medical imaging technology comprehensive practical training course

*Xiaocui Shen*

Jiangsu Vocational College of Medicine, Yancheng 224005, China

**Abstract:** Medical imaging plays a huge role in the process of health service engineering, in the whole life cycle of the human body, human health screening is inseparable from medical imaging, medical imaging technology comprehensive training is the core professional skills, in response to the national policy, adhere to moral cultivation, combined with Jiangsu Medical Vocational College of medical imaging school medical school collaborative education policy, Running through the main line of “healthy China, doctors take responsibility”, it constructs the ideological and political system of professional core courses from the four aspects of “Chinese spirit, professional ethics, ideals and beliefs, and professional quality”, innovates the teaching mode of “medical school integration, virtual -- simulation -- real machine three-step training”, and realizes the organic unity of ideological and political education and knowledge system education. To train students into noble medical ethics, exquisite medical skills, high-quality technical and technical talents.

**Key words:** Curriculum thinking and politics; Medical imaging; Comprehensive practical training

In December 2016, at the National Conference on Ideological and Political Work in Colleges and Universities, it was proposed to give full play to the main channel of classroom teaching, so that all kinds of courses and ideological and political theory courses can work in the same direction and form a synergistic effect. In August 2019, the General Office of the Central Committee issued several Opinions on Deepening the Reform and Innovation of Ideological and Political Theory Courses in Schools in the New Era, emphasizing the overall promotion of ideological and political courses in colleges and universities, digging deep into the ideological and political elements of professional courses, focusing on solving the problem of cooperation between ideological and political courses and giving full play to the educational functions of all courses. In September 2020, the Action Plan for Improving the Quality of Vocational Education (2020-2023) jointly issued by the Ministry of Education and nine other departments put forward important discussions on vocational education to equip the mind, and integrate the education of Party history, New China history, reform and opening up history, and the development history of socialism into the curriculum ideological and political thinking. In response to national policies, higher vocational education should speed up the improvement of the personnel training system, adhere to the combination of German and technical training, education and training, and integrate moral education into classroom teaching, skill training, practice and other links to guide students to develop in an all-round way.

## I. Condense the teaching objectives

This course uses a variety of medical imaging equipment, such as DR Machine, CT machine, MRI machine, etc., to carry out imaging examination of various parts of the human body, including image examination methods, precautions, body position design, image standard image recognition, image preliminary diagnosis, etc. While cultivating students to master the basic professional knowledge, relevant professional knowledge and practical skills involved in this course, the students will be trained to become high-quality technical talents with noble medical ethics and exquisite medical skills.

### 1. Knowledge objectives

Be familiar with the basic concepts and principles of various medical imaging techniques; Master the contraindications, indications and precautions for clinical application of various imaging techniques; Skilled and standardized operation of various imaging examination methods, condensed the precautions of various medical imaging examination techniques; Familiar with the standard image display and quality control of various medical imaging examination methods.

### 2. Competency objectives

Have the ability of independent learning, inquiry learning and lifelong learning; Have standard, skilled operation of various medical imaging equipment ability. Have the ability to understand the requirements of the application form and select the appropriate imaging methods; The ability to acquire, process, store, print and transmit images from medical imaging equipment; Ability to analyze and evaluate image quality; Have the ability of initial diagnosis image; Have the ability to deal with the emergency situation of X-ray inspection work.

### 3. Quality objectives

Train students to fear life, respect science and carry forward the Chinese spirit; Healthy China, radiation safety, cultivate professional ethics; Intelligent image, digital empowerment, strengthen ideals and beliefs; Doctors take on responsibility, keep improving, and cultivate professional quality.

## II. Improve the teaching design

This course includes 22 hours of scene simulation practice, 2 hours of theory, 4 hours of discussion, a total of 28 hours. According to moral education goals, clinical radiographers' post needs and students' actual learning situation, the teaching content of the course is sorted out. In the content design and planning of all levels, the main line of “healthy China and doctors' responsibility” is always run through, a new teaching syllabus is formed from the four aspects of “Chinese spirit, professional ethics, ideals and beliefs, and professional quality”, and the construction of the curriculum system is improved. Innovate the teaching mode of “medical school integration, virtual -- simulation -- real machine three-step training”

to realize the organic unity of ideological and political education and knowledge system education.

1. Reverence for life, respect for science, and promote the Chinese spirit

Based on emergency patients, strengthen students' understanding of the reverence for life, establish the value of life first, cultivate life consciousness, and let everyone live in the life consciousness of gratitude; Take the rise of domestic imaging equipment as an opportunity to cultivate students' respect for science, advocate the social atmosphere of innovation, put science popularization in the same important position as scientific and technological innovation, improve students' scientific quality in the teaching process, integrate "made in China" and other elements. For example: in the teaching process, watch the making process of sectional anatomy specimens to deepen the reverence and respect for life of medical students.

2. Healthy China, radiation safety, cultivate professional ethics

With "Healthy China 2030" as the action guide, stimulate students' self-radiation protection awareness and the ability to optimize radiation safety handling for patients, train students to establish a correct radiation protection safety concept, and explore health elements. For example, through the debate competition of typical cases of radiation protection, we can understand the significance and ethical issues of radiation safety.

3. Intelligent image and digital empowerment to strengthen ideals and beliefs

Enabling digital image and intelligent image technology can help the strategy of "Healthy China" and stimulate the sense of professional identity. Digital transformation of education is the current direction of education, improve students' digital literacy, cultivate digital talents, and strengthen the ideals and beliefs of lifelong learning through digital acquisition, production, evaluation and interaction. For example, the application of artificial intelligence screening technology for lung nodules image has improved the detection rate and accuracy rate of malignant lesions.

4. Doctors take responsibility, keep improving, and cultivate professional quality

Medical students should be rigorous, pragmatic and strive for excellence in the medical career, pay attention to the accumulation of typical cases, solid basic skills, and actively seek the best photography plan for special emergency patients. Strengthen academic exchanges and cooperation, and constantly explore new medical imaging technologies, new drugs and new methods. Through the "three checks and seven pairs" in the operation of medical imaging technology, students can feel the responsibility of doctors and the spirit of artisans. For example: after class by participating in community volunteer service activities, to carry out labor education.

### III. Detailed teaching implementation

Taking the general X-ray examination technology of radius and ulna in comprehensive medical imaging training as an example, electronic resources are pushed before class, and students complete the learning and practice of pre-class resources to guide the preview. In class, typical job tasks are taken as the main line, and the national digital medical imaging center is used as the carrier to carry out real machine practice operations on simulators. The case introduction teaching of "case introduction, case analysis, virtual simulation, simulation practice, real machine operation, quality evaluation, after-class expansion" is implemented to improve students' autonomous learning ability and post transfer ability.

1. Knowledge testing: pre-class task guidance, release of learning tasks, students use their spare time before class to watch the anterior-lateral ulnar and radius micro-lesson video, complete the cloud class pre-class test, cultivate students' good habit of independent inquiry and learning, and gradually develop the ability to find, analyze and solve problems. According to the cloud class pre-class test, the teacher fine-tuned the teaching content, analyzed the students' learning situation and divided them into groups according to the principle of inter-group homogeneity and intra-group heterogeneity.

2. Case introduction: The students were guided to think about the responsibilities of radiographers in imaging department in medical disputes based on the case, which inspired their thinking, stimulated their learning interest and enhanced their professional confidence. If it is the technician on duty who designs the implementation points of image examination under the case situation, select the best group to show the operation points. Through the professional position of image technician, we can think about the operation process, analyze the operation points, master the theoretical knowledge of X-ray photography, and lay a solid foundation for the subsequent practical training operation.

3. Analysis of cases: According to the display results, other students and teachers supplemented and improved the examination steps and examination indications; Improve students' language expression ability and logical thinking ability through group presentation.

4. Virtual simulation: students log in the virtual simulation system, from machine startup, to patient appointment triage, to body position placement, exposure and photography to understand the overall process of the anterior-lateral photography examination of the radius and radius, and complete the questions set in advance by the teacher during the operation of the virtual simulation system to remind and emphasize the key links in the inspection process.

5. Simulation exercise: According to the shooting plan, the members of the group are divided into different roles to simulate the image examination in medical dispute cases, and the teacher gives evaluation and guidance in the process of simulation operation. On the basis of the virtual operation, the practical operation level was further strengthened to further strengthen the professional skills foundation for the next part of the real operation practice.

6. Real machine operation: According to the students' mastery of the previous situation, the real clinical cases of different difficulties were respectively given situational drills, the whole operation process was standardized, and the generated images were post-processed after the exposure of the simulated people. Construct a professional job scene, and let students consolidate the operation skills of image examination technology through real clinical work tasks; The exposure part was replaced with a simulated person to avoid radiation damage to the students playing the role

of patients. Think about the application of intelligent images in radiation protection during practical operation.

7. Quality evaluation: Evaluate the quality of the images that have been generated, reflect on the setting and operation process of photographic parameters, and cultivate an attitude of excellence.

8. After-school development: Each group went to the affiliated hospital to collect 2 cases of patients with ulnar and radius trauma in their spare time, designed the DR Operation plan for emergency ulnar and radius trauma, and completed the simulation shooting video in the medical imaging training base.

#### IV. Diversified teaching evaluation

The multi-subject evaluation method of students, teachers and industry teachers is adopted. In addition to the traditional teacher evaluation, the evaluation form includes group mutual evaluation, individual self-evaluation and industry expert evaluation. The assessment types (FIG. 1) are divided into process assessment (platform data, virtual operation, simulation operation, stage test, etc.), final assessment (theoretical assessment + practical assessment), value-added assessment (radiation protection awareness, learning attitude, communication and expression, team cooperation, etc.). Students' understanding and application of technology were evaluated from the aspects of knowledge mastery, practical skill operation, emotional attitude and values. After class, teachers and clinical experts will evaluate students' skills, optimize teaching strategies according to the feedback, and further improve the teaching design. In the process of teaching evaluation, the behavioral data of students in the learning process is collected and analyzed with the help of vocational education cloud background data and tests to explore value-added evaluation. Based on online platform evaluation and offline interactive evaluation, the process evaluation of students before class, during class and after class is improved, and a multiple evaluation system can be recorded, analyzed and feedback-able is formed. According to the feedback, teachers adjust the teaching objectives and optimize the teaching strategies; Students actively reflect on themselves, strengthen teamwork and improve learning methods.

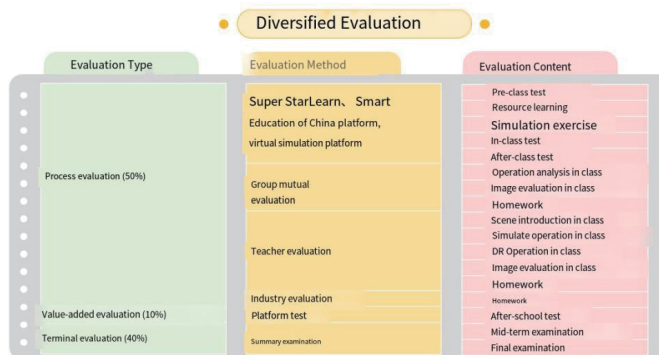


Figure 1 Teaching evaluation

Conclusion: Medical imaging plays a huge role in the process of health service engineering. In the whole life cycle of human body, human health screening cannot be done without medical imaging. Adhering to the main line of “healthy China, doctors take responsibility”, the comprehensive medical imaging training course continuously improves the education and teaching methods from the four aspects of “Chinese spirit, professional ethics, ideals and beliefs, professional quality”, carries out teaching reform through a variety of teaching means, gives play to students' subjective initiative, and carries out inquiry-based learning. To enable students to actively participate in all aspects of teaching. The course focuses on the typical tasks of medical imaging examination technology, integrates into the requirements of the national imaging Technology Skills competition, strengthens the cultivation of professional quality and value formation, improves the application of teaching effect and students' innovation ability, and achieves the goal of cultivating high quality technical and technical talents with noble medical ethics and exquisite medical skills.

#### Reference literature:

- [1] Yan Wang,Chao Wu,Jingguang Yi. Ideological and political Exploration of “Automatic Instrument” Course under the Training Goal of Applied Talents [J]. Heilongjiang Education (Higher Education Research and Evaluation),2023(05):79-81.
- [2] Cuidi Zhang,Jianping Lu,Huijun Sun,etal. Application research of “Curriculum Ideological and political” teaching Model in Nursing comprehensive skills training course [J]. Shanghai Nursing,2023,23(03):61-64.
- [3] Nanyang Zhang,Yuan Hou. Design and Production of NC Programming Course Micro-Course Integrating Ideological and Political Elements [J]. Modern Agricultural Machinery,2023(02):108-111.
- [4] Lin Zhao,Jin Zhang. On the important role of “Three full Education” in Strengthening and improving ideological and political education in colleges and universities [J]. The han teachers college journal, 2021, 9 (01) : 135-139. The DOI: 10.19575 / j.carol carroll nki/g4.2021.01.024 cn42-1892.
- [5] Langqiong Tang. Research on the evaluation index system of Professional Curriculum Integration into Curriculum Ideology and Politics in Higher Vocational Colleges [J]. Forest Teaching,2023(03):52-55.

**Fund:** Jiangsu University Philosophy and Social Science Research Project “Research on Ideological and Political Practice of Core Courses in Medical Higher Vocational Colleges under the Background of Medical Education Collaboration”, Project number: 2022SJYB2080.