

Integrating the Teaching Reform of Mass Entrepreneurship and Innovation Education into Medical Imaging

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Abstract:

By analyzing the current status of innovative education in medical colleges and medical imaging courses, this study expounds the necessity of integrating innovative education with professional curriculum education, and takes medical imaging courses as an example to explore the teaching reform path of integration and innovation, respectively, to identify the meeting point of innovative education and professional knowledge, integrate and optimize teaching content, and build a case database of imaging diseases. Enrich teaching resources; explore the practical training of PACS system to improve students' teamwork; carry out early clinical activities in advance to improve innovation literacy; and strengthen the training of innovative education teachers to enhance the ability of teachers to guide innovative education. At the same time, the paper also formulates the effect evaluation index, in order to provide reference for the integration of innovative education and professional education in medical colleges.

Keywords:

Innovative Education, Professional Education, Medical Imaging, Teaching Reform

1. Introduction

At present, domestic medical colleges and universities continue to strengthen innovation education, but also set up relevant innovation courses, a variety of innovative projects have also been supported, and achieved positive results. However, there are still some problems with the current situation of innovative education. For example, the integration system of innovative education and professional education is immature, the transformation of innovative education concepts is not in place, the contents and methods of carrying out innovative education are not perfect, the teaching staff of innovative education is not sufficient, and the practice platform for implementing innovative education is weak. Due to the strong professionalism of medical colleges, most medical colleges lack of understanding of the integration of innovative education and medical professional education, and have not formed a

curriculum system for cultivating innovative ability [1]. The current teaching of medical imaging courses lacks the systematic thinking and practical ability of innovative education, and the innovative elements of teaching content are insufficient, which restricts the initiative and enthusiasm of integrating innovative elements into professional teaching to a certain extent, resulting in a low degree of organic integration of medical imaging courses and innovative education. It fails to effectively cultivate students' innovative spirit, innovative thinking and innovative practical ability in professional teaching [2]. Therefore, integrating innovative education into medical imaging teaching is an important part of medical education reform in the new era, and it is also the key to the effect.

2. The Necessity of Integrating Innovative Education in Medical Colleges with the Teaching of The Professional Course “Medical Imaging”

2.1. The integration of innovative education and professional education in medical colleges is an important teaching reform measure

Our country is in a critical period of building an innovation-driven country and implementing innovation-driven development strategy. Deepening innovative education reform in colleges and universities and promoting the effective cohesion with professional education are the necessary requirements for carrying out national strategic deployment. It is also an important way to improve the quality of personnel training and realize the intension development of higher education. As a strategic science and technology field supported by the state, medical colleges need to strengthen innovative education in the professional teaching process, cultivate students' innovative spirit and practical ability, promote reform through innovation, promote development through reform, and train more high-level compound medical talents [3].

2.2. Carrying out innovative education based on the characteristics of medical professional course "Medical Imaging" is of great significance to the training of higher medical talents

Medical Imaging is a professional basic course integrating practicality, professionalism, application and experience. Based on imaging anatomy, it uses various medical imaging techniques to show the internal tissues, organs and structures of the human body, so that clinicians can judge the diseases of patients. It is an important carrier and opportunity to improve medical students' clinical diagnosis and treatment ability and critical thinking ability, and also an effective way to train students' innovative spirit, innovative thinking and innovative practice ability. Therefore, it is particularly important to cultivate innovative medical and health talents by fully reflecting and implementing innovative education concepts and integrating corresponding teaching contents and activities in the teaching of specialized courses, so that students can be influenced by new thinking and driven by new requirements while learning professional knowledge and skills [4].

3. Teaching Reform Path Integrating Medical Imaging Courses with Innovative Education

3.1. Identify the convergence of innovative education and professional knowledge

3.1.1. Integrate and optimize the teaching content, and fully tap the cross-knowledge points of disciplines

In the teaching of medical imaging course, firstly, the knowledge framework of the course is sorted out from the whole, and the structure is optimized to make it more systematic and rational. On this basis, the interdisciplinary knowledge points should be further explored, the contact points between medical imaging and computer technology, artificial intelligence, virtual simulation, 3D printing and other frontier cross-cutting fields should be expanded, the thematic teaching should be added, the horizons of students should be broadened, the understanding of the development direction and application prospect of medical imaging should be deepened, and the cognition and application ability of cross-innovative thinking should be cultivated.

3.1.2. Collect relevant materials and edit teaching notes

According to the adjusted and optimized teaching content and framework requirements, in-depth collection of cutting-edge theoretical and technical data of medical imaging, successful application cases, etc., editing a series of special teaching handouts. Among them, in view of the application of artificial intelligence in medical image-assisted diagnosis and other aspects, a series of contemporary and forward-looking cases are sorted out to share the practical experience of cross-innovation between medical imaging and high-tech, so as to stimulate students' innovative interest and thinking, and inspire them to actively think about how to use new ideas and new technologies to solve practical problems in professional learning.

3.1.3. Carry out special teaching for hot and difficult issues

On the basis of the regular theoretical course teaching, a series of special learning activities are set up aiming at the hot and difficult problems in the study of medical imaging major and the cross-application fields with other disciplines. These topics are aimed at hot topics such as AI-assisted medical image recognition, innovative application of 3D printing technology in customized image diagnosis and treatment, and interpretation of emerging image technology progress. The purpose is to broaden students' professional vision, inspire them to learn and think about professional problems in multi-dimensional ways, and cultivate innovative thinking models.

3.2. Construct course case database and enrich teaching resources

3.2.1. Construct innovative teaching medical imaging case database to carry out characteristic teaching

According to the characteristics of different diseases, different disease image case databases are established, such as integrating clinical thinking and politics case database into curriculum thinking and politics, enhancing curriculum challenge degree with the same shadow and different diseases case database, etc., to guide students to explore knowledge independently. In the teaching process, guided by clinical practical

problems, students are constantly guided to make independent logical analysis and independent exploration, and solve problems independently with the knowledge they have learned. Through group discussion of clinical cases, students can improve their ability to solve problems and combine theory with practice.

3.2.2. Using Chinese university MOOC, learning Pass, etc. to carry out online teaching

Through the MOOC platform of China University and the “Learning Link” network teaching service system of the school, the teaching process is arranged in real time, the learning materials are released, and the teaching activities such as online Q&A and online test are conducted and the learning situation is analyzed. The online teaching mode of “MOOCs + Learning knowledge” realizes the extension and expansion of classroom teaching, effectively improves the flexibility and initiative of learning, and creates a good condition for introducing teaching content such as project research and skill training into the network environment [5].

3.2.3. Diversified teaching methods to meet students' learning needs

In teaching, students are encouraged to participate in “Internet +” innovation and entrepreneurship activities to promote learning to foster students' divergent thinking and innovative spirit, and guide students to participate in teachers' scientific research and innovation practice, and from the scientific research and social service projects undertaken by the teaching team members, a series of research-based teaching content is derived, so as to form a good interaction between teaching and competition and scientific research.

3.3. Explore the practical training teaching of PACS system

3.3.1. Adopting the problem-oriented, case-first heuristic teaching model

On the basis of traditional imaging diagnostics practical training programs, the teaching mode of “problem-guided and case-first” is adopted in view of students' weak ability to analyze and solve practical clinical problems [6]. That is, before the practical training, provide typical case data, organize students to discuss the etiology and formulate examination plan; In the practical training, the teacher leads the students to enter the corresponding system, operate the equipment to complete various checks, organize the discussion of the image performance, judge the condition, and formulate the diagnosis and treatment plan; After practical training, summarize the situation of ability training and guide students to reflect on the place to be improved.

3.3.2. Simulate multidisciplinary diagnosis and treatment collaboration to cultivate clinical thinking

In medical imaging training, multidisciplinary team cooperation simulation training project was set up. Students were divided into medical, surgical, imaging and other groups. According to the provided cases, under the guidance of the teacher, they completed the whole process of medical history inquiry, symptom and sign collection, examination plan determination, and treatment plan formulation, and finally, appropriate mutual evaluation and communication among the groups.

3.3.3. Improve students' ability of teamwork and scientific research innovation

The introduction of multi-disciplinary team cooperation elements and the use of situational simulation teaching mode in the practical training not only strengthen the training of clinical thinking and communication expression of students, but also exercise the ability of teamwork, which reduces the psychological pressure between each other and makes it easier to give play to imagination and creativity. In addition, the medical imaging system platform has been used to set up some innovative application design projects, such as the use of VR virtual simulation technology to simulate the image operation process in a specific environment, so as to cultivate students' innovative thinking and improve their innovation ability.

3.4. Carry out early clinical activities in advance

3.4.1. The concept of “early clinical treatment” is added to the theoretical course

In the teaching of medical imaging theory course, in addition to imparting professional knowledge, attention is also paid to the cultivation of clinical medical literacy and thinking, adding some “early clinical” content. For example, when teaching the anatomical structure of each system, the actual case image is displayed and analyzed; When teaching imaging manifestations, emphasis is placed on the connection with clinical symptoms and signs, as well as the consideration of the next diagnosis and treatment.

3.4.2. Internship in hospital to stimulate learning motivation

Before the start of the course, clinical medicine students go to various departments of the hospital to practice, focusing on the application of medical imaging system. During the internship, students follow doctors to make ward rounds, observe consultations, participate in imaging diagnosis, and learn to operate imaging equipment appropriately. This early exposure to clinical practice stimulates students' intrinsic motivation to continue learning professional knowledge and deepens their thinking on their own professional development direction [7].

3.4.3. Deepen medical professional understanding and improve innovation literacy

Through early exposure to clinical medical practice activities, students in different departments can have a direct perceptual understanding of different system diseases, understand the internal logic of professional knowledge, and clear future career positioning, which is also a favorable opportunity to cultivate entrepreneurial consciousness and innovative thinking.

3.5. Strengthen innovative education and training

3.5.1. Ask experts to provide training guidance to the teacher team

In order to further improve the innovative education concept and ability of medical imaging professional teachers, the school invited entrepreneurship education experts to systematically understand the connotation and method system of innovative education through a series of training, including the creation of innovative atmosphere, curriculum content adjustment, innovative ability training, teaching mode reform and other specific implementation points.

3.5.2. Encourage teachers to participate in innovative educational exchanges and academic conferences

Through the evaluation of awards and other ways, we actively support front-line teachers including medical imaging majors to participate in innovative education teaching seminars, discipline competitions, teaching results display and other activities.

3.5.3. Improve teachers' ability to guide innovative education

Through expert training and academic exchanges, innovative education concepts and practices are actively and consciously integrated into the professional teaching design and organization process, and heuristic teaching methods are used in professional teaching to better "dissolve" innovative elements in the professional teaching content and form a team of high-quality professional teachers with strong innovative education guidance ability.

4. Evaluation of the Effect of the Integration of Medical Imaging Courses and Innovative Education

4.1. Degree of combination of theoretical knowledge and innovative thinking

Set open-ended and applied analysis questions to evaluate students' ability to use professional knowledge and innovative thinking. In the examination of medical imaging courses, open discussion questions and comprehensive analysis questions were added for different categories of students to test the organic integration effect of professional teaching content and innovative elements. That is, on the basis of describing the actual clinical situation, it puts forward the needs of imaging technology application or new technology research and development, requires students to use their professional knowledge to design solutions or predict new technologies, tests students' mastery of imaging professional knowledge, and observes the play of innovative thinking and application ability.

4.2. Degree of improvement of practical ability and entrepreneurial literacy

The improvement of students' innovative literacy was assessed through practical training performance scoring and hospital internship evaluation. In the practical training of medical imaging, teachers conduct practical training evaluation from the perspective of problem solving, and test the effect of students' application of knowledge to analyze images and judge diseases. In addition, the students also did internship in different departments of the hospital in batches, and the teachers from the departments assessed and evaluated the dimensions of students' innovative literacy such as active learning, hands-on operation and teamwork, forming direct feedback on the improvement of innovative education ability.

5. Conclusions

Based on the realistic needs of the reform and development of contemporary medical education, this study takes the course of medical imaging as an example to actively explore the teaching reform and practice based on the integration of innovative education and professional education. The main contents include: the problems existing in current medical education and the necessity of reform are expounded, and the position of professional curriculum is proposed. The innovative educational ideas and elements are integrated into the professional teaching path, and

the concrete implementation of the medical imaging course is given, and the effect evaluation framework is also constructed.

Conflicts of Interest

The authors declare that there is no conflict of interest regarding the publication of this article.

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