THE CONSTRUCTION OF A COMPETENCE-ORIENTED DIGITAL TEACHING MODEL IN ANESTHESIOLOGY

Bijun Zou[1], Na Guo[2], Wan Huang[2]*

1. Department of Scientific Research and Education, Sun Yat-sen University Cancer Center, State Key Laboratory of Oncology in South China, Collaborative Innovation Center for Cancer Medicine
2. Department of Anesthesiology, Sun Yat-sen University Cancer Center, State Key Laboratory of Oncology in South China, Collaborative Innovation Center for Cancer Medicine
Address: 651 Dongfengdong Road, Guangzhou, 510060, China
*Corresponding author: Wan Huang, E-mail: huangwan@sysucc.org.cn

Abstract:

Competency-oriented clinical training model is an important direction and goal in medical education reform. Anesthesiology is a secondary discipline of clinical medicine, and it is of great significance to develop the digital teaching model of anesthesiology in order to construct a competence-oriented teaching system. The present study summarizes "the evaluation index system" in the knowledge and skill training; "the whole-course tutor" and "lead tutor" in the cultivation of scientific research innovation ability; the ability training based on clinical skills competition and crisis scenario challenge; "the competence-oriented" medical student training model by means of peer education and volunteer service in a single teaching hospital.

Key words: competency; teaching reform; Anesthesiology; digital education and teaching

Anesthesiology is an important comprehensive discipline in clinical medicine, which contains clinical anesthesia, vital function monitoring, critical monitoring and treatment, and pain diagnosis and treatment. It not only involves basic theoretical knowledge of physiology, pharmacology, pathology, internal and external gynecology and children, but also involves technical operations, such as endotracheal intubation, intraspinal puncture, arteriovenous catheterization and cardiopulmonary resuscitation. Clinical anesthesia training plays an important role in improving the quality of medical students. With the in-depth reform of global medical education, requires anesthesia doctor should not only have solid theoretical knowledge and skilled hands-on ability, but also have the doctor-patient communication skills and team cooperation ability, scientific development ability and high professional quality, so the post competence oriented teaching reform is imperative.

With the development of information science and technology, it is an inevitable trend to introduce digital technologies in medical education, such as cloud computing and big data while conducting research, practice and education. The application of "digitalization" in medical teaching refers to the combination of network technical resources with the medical and health industry and communities. Internet plus education has become an important starting point for the national education cause. Based on digital resources, a digital teaching environment combining on-campus and off-campus is provided for anesthesiology students to share digital advantages. The scale of China's Internet plus medical market has risen to more than 3 billion yuan, and in the next 10 years, there will be explosive development. As a teacher in a medical college, we should use the advanced technology for our own use and for our profession, and improve the teaching quality of clinical anesthesiology through the digital platform, so as to make the best use of everything.

The teaching of anesthesia training should emphasize the coordination of medicine and education, and take the training of medical talents as an important mission. Active research and practice in exploring the training mode of anesthesiology talents has been made to meet the needs of society and constructing the course system of anesthesiology specialty oriented by competency, which mainly includes the following aspects: firstly, establish "evaluation index system" to cultivate knowledge and skills; secondly, the cultivation of scientific research innovation ability led by "whole-course tutor" and "lead tutor"; thirdly, ability training based on the clinical skills competition and crisis scenario challenge competition; lastly, humanistic and professional cultivation by means of peer education and volunteer service. The core purpose of establishing the training system is to cultivate outstanding medical professionals who meet the needs of society, master the necessary knowledge of humanities and natural sciences, have basic theories and solid skills of basic and clinical medicine, and are able to engage in medical services, scientific research innovation and medical teaching.

1. THE CONNOTATION OF COMPETENCY

Competency refers to deep personal characteristics that distinguish high achievers from the average person in a particular job which was firstly described by Harvard professor David McClelland in 1973. It can be motivation, traits, self-image, attitudes or values, domain knowledge, cognitive or behavioral skills, any individual characteristic that can be reliably measured or counted and that significantly distinguishes excellent from average performance. The competency of doctors refers to "the skilled and accurate use of communication skills, academic knowledge, technical means and clinical thinking in daily medical services, so as to benefit the individuals and groups served". As a qualified medical

students, the elements of competency should include several aspects, such as clinical skills and health services, disease prevention and health promotion ability, information and management ability, medical knowledge and lifelong learning ability, interpersonal skills and team cooperation ability, scientific research ability, core values and the doctors professional quality and so on. Competency-based learning requires identifying the health problems to be addressed, identifying the competencies that medical graduates should possess, adjusting the curriculum to enable these competencies, and finally assessing the successes and failures. Therefore, to realize the optimization of the curriculum system of anesthesiology specialty based on post competency will play a positive role in promoting the training of anesthesiology professionals.

2. CURRENT SITUATION OF ANESTHESIOLOGY TEACHING UNDER DIGITALIZATION

(1) The construction of digital infrastructure is generally started but not perfect

As the forefront of digital teaching, medical education has begun to integrate information technology with medical education. Most medical schools have realized the arrival of the digital era and started to build information technology teaching facilities, and have a certain sense of digital education and teaching. However, due to the comprehensive influence of regional and school factors, the level of construction is not balanced.

The construction of digital teaching resources is related to the level of regional economic development, the financial situation of the school and the concept of educational development. In addition to basic digital teaching equipment, some schools also have digital teaching resources such as electronic reading room, network resource library, wechat platform and tutor studio for students' extended learning, which shows a trend of teamwork. Some colleges and universities carry out "teaching, study question bank, examination, marking, school-based curriculum resources" and other sectors of integration. Through precise personality data statistics, we can efficiently and pertinently grasp the blind areas and bottlenecks of students' learning, understand their academic dynamics more deeply and comprehensively, and give more effective and practical feedback. The information technology in only some areas is still in its initial stage, and the teaching facilities in

schools are relatively old, which reduces the utilization rate of teaching equipment by teachers and students. Colleges do not pay much attention to the construction of software such as teaching resources, and it is difficult to form a sustainable, systematic and efficient management mode. For the construction of digital teaching resources, teachers mostly stop at the basic level of making multimedia courseware or micro-lesson in lesson preparation and using multimedia assisted teaching in class. The accumulation of teaching resources is mostly fragmented, lacking the development and support of systematic platform and scientific selection and guidance, which makes it more difficult to form the construction plan of sustainable development.

(2) The popularity of digital education teaching research increases, but the theoretical learning is mostly superficial

An important field in the research of digital education and teaching is to discuss the effective integration of information technology and subject curriculum. Medical education for the study of the theory of digital education teaching for occasional contact to learn more, for how can the fusion of information technology and courses more to stay in the superficial understanding, and the way to learn is more dependent on the school organization on special topics training and network courses, a small group of teachers choose autonomous reading books or papers, and carry on relying on the education teaching practice question construction and active exploration. How to generate problems in theoretical learning and practice, and use diversified theoretical approaches to conduct in-depth research, and finally promote the relevant practice, improve the quality and efficiency of anesthesiology teaching, these issues deserve attention.

(3) Pay attention to the use of digital education and teaching resources in and out of class, but the effectiveness of the use is not enough

In the process of using digital equipment or platform to carry out interactive teaching, the recognition of teachers and students is generally high, which is not only reflected in the improvement of learning interest and the deepening of learning degree, but also improves the efficiency of classroom teaching. However, there are also some problems such as formalization and decentralization. In the integration of information technology and subject courses, the teachers' original cognitive structure and shallow theoretical reserve are mostly limited, and the digital teaching in most schools mainly stays at the application level of multimedia courseware. In terms of this aspect, there are also problems such as courseware making and teaching content is not appropriate enough, making and operating technology is not skilled, teachers sometimes just take multimedia courseware as the displacement of textbooks, the traditional teaching and so on completely abandoned, and there is no corresponding teaching method reform, it is difficult to really effective integration. Even though some schools are equipped with digital teaching equipment, some teachers with deep-rooted traditional ideas still reject this teaching method. Some schools rely

too much on digital teaching equipment, but ignore the depth of the subject content itself, which eventually leads to limited students' gain and teachers' struggle to cope.

After all, information technology is only an auxiliary means of teaching, and should not overshade the teaching content itself and the substantive thinking of the problem. On the basis of inheriting the essence of traditional teaching, teaching innovation in the digital environment always adheres to the content and problem as the basis. No matter in the traditional teaching, or VR assisted teaching and other forms of digital teaching environment, it should not be limited to the form. We should make proper use of it, give full play to its auxiliary teaching function, dig deeply from the essence of teaching content, and look for the most effective method to integrate them. We must not put the cart

before the horse. In a word, in the practice of digital education and teaching, there are still teachers and students' expectations and enthusiasm, but how to deeply integrate information technology and subject teaching is a problem that we need to focus on and promote the implementation.

3. CONSTRUCTION OF A "COMPETENCY-ORIENTED" DIGITAL TRAINING MODEL FOR MEDICAL STUDENTS

(1) Establishment of "evaluation index system" and training of knowledge and skills

The training of clinical professional knowledge and skills is the core and fundamental of medical education. The assessment and evaluation system that adapts to students' comprehensive and coordinated development and personalized learning needs includes: ① strengthening formative evaluation, strengthening learning process management, and constructing classroom learning and examination evaluation system including classroom discussion, classroom test, case analysis, mid-term examination and so on; ② to reform the final evaluation, the evaluation method combining the final theory examination and the basic skills operation examination can be adopted. Construct an assessment and evaluation system that adapts to the comprehensive and coordinated development of students' knowledge, ability, quality and individual learning needs, and give play to the educational, guiding and guiding roles of assessment in curriculum teaching and talent training; ③ to overcome the "three-step" traditional teaching mode of clinical teaching lag, clinical teaching, strengthening the hospital implementation based on a medical simulation platform independent "clinical skills operation" course, realize thoroughly clinical teaching, to enhance the clinical teaching of sequential, continuity and effectiveness, to make medical students clinical professional knowledge and skills more solid system. In addition, the students were actively organized to participate in the clinical skills competition and crisis scenario challenge, so as to improve the training of clinical thinking and operation ability.

Medical teaching digital platforms or apps are widely used, such as "Questionnaire Star" and other special teaching apps. The characteristic of this kind of

teaching platform is that its development concept is based on special teaching, so its teaching function is more perfect than wechat and other universal apps. Questionnaire Star, which is a free online platform integrating questionnaire, examination and voting. There is no limit to the number of questions or answers, and it supports categorical statistics and cross analysis, as well as online mobile filling. The teaching quality can be improved by practicing before class, highlighting the key points in class and strengthening memory after class. Some digital teaching platforms developed by medical colleges and universities have certain common characteristics. For example, the users of the system network mostly include the system administrators of schools, teachers of hospitals and students. Although the above digital platform is novel, it also has some limitations. The above studies are all aimed at clinicians' probation, which emphasizes the diagnosis and treatment of diseases and the writing of documents. If they are specific majors or other majors that emphasize operation, such as anesthesia, they cannot fully fit. As a new teaching concept, micro-class has gradually penetrated into the teaching of various disciplines and levels, and it will increasingly become a new method in the practice teaching of anesthesiology. Our practice found that through the information technology platform can be used for the teaching model around the case. A large number of low-level visits are converted into the communication between students and teachers, and the visits with questions and objectives not only improve the basic requirements of preoperative visits, but also enhance the communication confidence of students, and improve the quality of anesthesia preparation for the next day's surgery. The writing of anesthesia plans has been greatly improved. Sufficient patient information has been obtained through the information platform, and the outline of patient history can be understood before contact, and case-based learning can be carried out under the guidance of superior doctors and through the treatment of similar cases.

(2) Cultivation of scientific research innovation ability

Scientific research innovation ability is the driving force for the sustainable development of high-level medical talents. The digital teaching environment creates conditions for the traditional classroom to turn to a broader learning space, and also provides teachers and students with online hypertext, multimedia world and other exploration platforms in addition to classroom teaching, which is both an opportunity and full of challenges. All students should have access to vibrant, high-quality teaching and learning activities that are challenging in the digital age. Therefore, it is necessary to study the situation of middle school education and teaching and practice base management in the digital age. Therefore, as a clinical teaching base, the hospital has set up a series of platforms for the cultivation of medical students' scientific research ability: equipped with "whole-course tutor" and "lead tutor" for double tutor scientific research guidance; hold "science and technology festival" and other academic activities to

build a platform for students to join research teams, engage in early research training, and display research results; provide special scientific research lectures for students, such as clinical statistics, daily literature reading, etc., to improve their scientific research ability; select and recommend outstanding students to participate in project application, encourage students to participate in invention patent design. Students are encouraged to participate in various academic activities and continuing education training at all levels, so as to cultivate their awareness and ability of scientific research innovation and understanding of the latest developments in the discipline, and lay a solid foundation for their sustainable development after graduation.

(3) Cultivation of professional humanistic quality and team cooperation

Strengthening the quality education of students focuses on the cultivation of humanistic spirit, integrating humanistic quality education into the whole curriculum system of anesthesiology, and cultivating students' profound humanistic feelings. ① Hospitals pay attention to professional quality education and edification; Medical ethics, ideological and moral

4. THE PRACTICAL SIGNIFICANCE OF "COMPETENCE-ORIENTED" MEDICAL STUDENT TRAINING MODEL

With the transformation of modern medical model, the rapid development and update of medical technology and concept, as well as the complex medical environment and doctor-patient relationship, the comprehensive ability of practicing doctors is increasingly required. The Global minimum essential requirements in medical education and the standards for undergraduate medical education in China put forward the goal of the comprehensive quality of medical students: "Medical schools must cultivate students' competence in positions related to their subsequent training and future health professions". The whole process of clinical teaching, multi-level and multi-angle training of medical students' post competency is the core requirement of medical personnel training quality.

On this basis, the university revised the training program for anesthesiology professionals and redefined the training objectives of anesthesiology: students should have basic theories, basic knowledge and basic skills in basic medicine, clinical medicine and anesthesiology, complete basic training in anesthesiology and clinical medicine, and be able to work in the fields of anesthesiology, emergency department, emergency center, intensive care unit (ICU), drug dependence treatment and pain diagnosis and treatment in medical and health units. Medical graduates who are engaged in clinical anesthesia, emergency and resuscitation, critical care monitoring, physiological function regulation, medical research, etc., with innovative spirit, preliminary clinical ability, lifelong learning ability and good professional quality. The medical talent training goal is to develop a highly social sense of responsibility, good medical professionalism, generous nature, humanities and social science foundation, the solid medical basic theory

education should be carried through the process of classroom teaching, standardized training teaching and problem-based group discussion teaching (PBL). ② The teachers and students of anesthesiology should be initiated to develop hidden courses related to anesthesiology in their spare time, so as to cultivate the professional ethics and cultivation of anesthesiology students. ③ Through holding medicine, culture, art, history, such as seminar, organized a variety of campus cultural activities, such as high art into campus students edify sentiment, improve students' cultural quality, to encourage teachers and students to participate in academic activities at home and abroad, to broaden horizons, inspiration, rich academic and cultural life, make every student stay anesthesiology professional culture. ④ Through all kinds of class meetings, reading activities, hospital humanities lectures, professional quality education and the cultivation of team spirit. Through volunteer activities, volunteer activities, etc., to understand the responsibilities of doctors and patients' suffering; enhance the spirit of mutual help and teamwork through peer education.

knowledge and basic clinical skills, independent learning and lifelong learning ability, critical thinking and innovation ability, engaged in scientific research ability. Some of the medical talents who meet the needs of international medical services and scientific development will become high-level, internationalized top-notch innovative medical talents with the ability to solve difficult problems, lead the development of disciplines and have international competitiveness in the future.

In the digital learning practice base, appropriate classes and project groups are created, and the practice content is reasonably arranged according to the project group. The practice is changed from teaching to collaboration, and the classroom form is reconstructed. At the same time, using the Internet, big data and other information technology, the introduction of advanced intelligent algorithms, automatic record, feedback and visualization of students' learning and practice behavior data, simulation practice and full practice and other activities content and form, to realize the collaboration between students and enterprises learning, inquiry learning, interactive learning. Students gain educational growth through interaction and collaboration in the corporate internship environment.

The construction of digital learning practice base can accurately track students' learning practice and practice process. Introduce information technology to build intelligent and digital learning space, and form a new model of networked, intelligent, ubiquitous and personalized learning practice that organically combines online and offline. The learning data left by students in and out of school and practice. Based on big data analysis and mining technology, the three-way evaluation system of learning effect output evaluation, learning experience process evaluation and learning value-added development evaluation is used to conduct accurate portrait and objective evaluation of students, normalize data collection, and realize data and visualization of

talent training evaluation.

5. CONTINUE TO EXPLORE THE FURTHER REFORM OF ANESTHESIOLOGY CURRICULUM SYSTEM BASED ON COMPETENCY

The aim of this study is to make full use of advanced Internet technology and modern statistical analysis methods, and to form a positive and institutionalized anesthesiology teaching model based on a convenient and rapid network environment. With the help of advanced network technology and good educational information construction hardware background, at the same time only have advanced network technology is not enough, to establish a set of management system that really matches with the Internet technology is also indispensable. Medical education reform needs to continuously explore and practice of anesthesiology also should strengthen the teaching reform for psychiatry. Together, to build a medical talents of anesthesiology post competency force, must optimize the integration of the existing education teaching resources, adjust the course structure and teaching content, including case teaching, bilingual teaching, strengthen the quality education, further reform and improve the professional course system of anaesthesia. The construction of this system has two main characteristics: one is to establish the digital assessment management platform of anesthesia teaching by technical means; the other is to establish the corresponding supervision system and effectively implement it, so that the platform can really play its role in improving the quality of students' teaching. Of course, the digital construction of anesthesia teaching includes many aspects, and the points we put forward are only a small part of them. We will continue to build the digital practice base in the future, which will not only bring more independent space and practical training experience for students, but also bring more benefits to the base.

Above all, medical colleges should focus on the digital teaching mode construction of outstanding doctor training mode reform, so as to meet the social requirements of training the competence of medical talents.

DECLARATIONS

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