

Exploration of medical innovation and entrepreneurship education reform in the context of new medicine science

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Abstract: Currently there is little research on the innovation and entrepreneurship education reform in the context of new medical science, which makes it educationally significant to conduct relevant research. Through literature and policy analyses, this paper discussed the connotation of new medicine science and identified its new connotations, namely new concept, new structure, new model, new quality and new system. On this basis, this paper further analyzed the five new requirements of new medicine science for innovation and entrepreneurship education and then proposed the innovation and entrepreneurship education concept of "planning medical development with new ideas, adjusting teaching resources with new structure, strengthening medical student training with new model, promoting medical education development with new quality, leading medical education innovation with new system". In view of the five new requirements, this paper also put forward five educational and teaching reform strategies against medical innovation and entrepreneurship education in the context of new medicine science as establishing new ideas, adjusting educational structure, building a new model, promoting education quality and improving new education system. This paper enriches the research on the innovation and entrepreneurship education in the context of new medicine science.

Keywords: New medicine science; Medical college; Innovation and entrepreneurship education; Five new requirements; Teaching reform

1. Research Background

In order to meet the requirements of a new round of scientific and technological revolution and industrial change, a new education concept, namely life-health whole-cycle medicine science from treatment to prevention and from treatment to rehabilitation has been proposed in new medicine science [1]. Various medical colleges and universities have opened new specialties such as precision medicine, translational medicine and intelligent medicine [2] to meet the new requirements of medical education put forward in the new medicine science. However, the medical innovation and entrepreneurship education in the context of new medicine science is rarely studied. Under the background of new medicine science, medical innovation and entrepreneurship have become the new trend and demand of medical education reform. Medical education is expected to cultivate more medical talents with innovative and entrepreneurial spirit. Therefore, medical innovation and entrepreneurship education reform should not only focus on practice, science and rationality, but also provide practical opportunities and resource support for students. Therefore, it is necessary to explore innovation and entrepreneurship education in the context of new medicine science so as to effectively promote the reform and development of medical innovation and entrepreneurship education, cultivate more innovative and entrepreneurial medical talents, and make contributions to the development of new medicine science.

2. Research Questions

Since the emergence of the five new requirements for medicine science, existing medical innovation and entrepreneurship education can no longer meet the demand for high-quality personnel training in this field. First, new medicine science requires medical innovation and entrepreneurship education to establish the new concept of innovative, scientific and comprehensive medicines science education [3]. With the progress of science and technology and industrial changes, medical innovation and

entrepreneurship education reform needs to define new goals and establish new ideas based on the new strategy of healthy China, the new situation of international competition and the new requirements of moral education. The innovation and entrepreneurship education reform of new medicine science requires personnel training to meet the medical development needs in the new era, which, therefore, should not only upgrade the existing training system of clinical medicine and basic medicine, but also strengthen the construction of medical +X interdisciplinary disciplines, develop innovative, scientific and comprehensive medical innovation and entrepreneurship education, and cultivate outstanding scientific and technological doctors [4]. Second, a multidisciplinary innovation and entrepreneurship system of "new medical science" should be established, and a "new structure" of medical specialty should be constructed. With the continuous progress of medical technology and medical scientific research technology, new requirements are put forward for the knowledge structure of future doctors. It is necessary for medical colleges to explore new innovation and entrepreneurship education and try to carry out medical innovation and entrepreneurship education on the basis of learning science and engineering. Colleges and universities should also increase the proportion of mathematics, biology, and big data courses in basic medicine and biomedical education [5]. However, domestic medical schools do not offer interdisciplinary innovation and entrepreneurship courses. The construction of "new medicine science" requires the initiative to set up and develop emerging medical specialties, promote the reform and innovation of existing medical specialties, develop medical innovation and entrepreneurship education subjects organically combined with humanities, medical specialties, science and technology foundation, frontier science and cross-disciplinary courses, and construct the "new structure" of new medical specialties. Thirdly, it is of great importance to explore a "new mode" of talent training that adapts to the needs of the new era [6]. At present, college education and standardized training of clinicians are mainly adopted for training medical talents in China. In the construction of "new medicine science", it is also necessary to further improve multi-subject cooperative education mechanism. On the basis of "medical and educational cooperation", collaborative mechanism of "medicine, education, industry and research" has been introduced to establish multi-level and multi-field cooperative education of innovation and entrepreneurship, explore the training mode of multi-disciplinary integration of medical talents [7], establish an interdisciplinary talent training system and project platform [8], develop innovative clinical and medical scientific research practice bases, and cultivate outstanding medical talents who are proficient in medicine, knowledgeable in science and technology and able to lead the times. Fourth, internationally competitive education "new quality" is required [9]. In such context, Chinese medical education should aim to strengthen the construction of quality standard system of medical talent training, establish and perfect the medical education professional certification system with Chinese characteristics and international substantive equivalent, create "Chinese concept" and "Chinese standard", and constantly improve the quality of education training of innovation and entrepreneurship as well as enhance the international competitiveness of Chinese medical education by taking the construction of "new medical science" as an opportunity and basing on the reform and development frontier of international medical education. Fifth, new medicine science requires to establish a future-oriented "new system" of innovation and entrepreneurship education with Chinese characteristics. China is entering a great era of contributing China's wisdom and solutions to the problems of human development as it is becoming increasingly influential in the international community. China's medical education reform should also aim at leading the development of human civilization, and establish a "new system" of medical innovation and entrepreneurship education with Chinese characteristics, including optimizing training system, updating curriculum, changing teaching model, and focusing on practical education, so as to lead the reform of global medical innovation and entrepreneurship education. Therefore, exploring the five new requirements under the background of new medicine science has important guiding significance to medical innovation and entrepreneurship education.

3. Analysis

In general, new medicine science puts forward new requirements for medical innovation and entrepreneurship education from five perspectives, namely concept, structure, model, quality and system. In terms of new ideas, we should upgrade existing training system of clinical medicine and basic medicine, strengthen the construction of medical +x interdisciplinary disciplines, develop innovative, scientific and comprehensive medical education, and train outstanding scientific and technological doctors. New structure means that we need to take the initiative to set up and develop emerging medical specialties, promote the reform and innovation of existing medical specialties, and develop the "new structure" of medical specialties organically combined with humanities, medical specialties, science and engineering fundamentals, frontier science and technology, and interdisciplinary courses. New model means to improve the multi-subject collaborative education mechanism [7], establish multi-level and

multi-field cooperative education, explore the medical talent training mode of interdisciplinary integration, establish interdisciplinary talent training system and project platform [10], and develop innovative clinical and medical scientific research practice bases, as well as cultivate outstanding medical talents who have refined medicine, understand science and technology and lead the times. In terms of new quality, we are expected to strengthen the construction of the quality standard system for training medical talents based on the reform and development of international medical education, establish and improve medical education professional certification system with Chinese characteristics and international substantive equivalent, create "Chinese concept" and "Chinese standard", constantly improve the quality of professional personnel training, and enhance the international competitiveness of Chinese medical education [11]. New system means that we should establish a "new system" of medical education with Chinese characteristics with the goal of leading the development of human civilization, including optimizing training system, updating curriculum, changing teaching model and focusing on practical education, so as to lead the reform of global medical education. These five new requirements pose new challenges to the medical innovation and entrepreneurship education.

4. Countermeasure

Facing the new demands and challenges of new medicine science, medical colleges should re-examine existing medical education system and structure, make plannings on the medical innovation and entrepreneurship education model in the new era. They are hoped to "plan medical development with new ideas, adjust teaching resources with new structure, strengthen medical student training with new model, promote medical education development with new quality, and lead medical education innovation with new system", leading the reform and development of higher medical innovation and entrepreneurship education:

First, new ideas should be established for the medical innovation and entrepreneurship education. 1) Strengthen interdisciplinary integration: Medical innovation and entrepreneurship education needs to strengthen interdisciplinary integration, organically combine medicine with other disciplines, and promote cross-border cooperation in medical innovation and entrepreneurship; 2) Pay attention to social responsibility: Medical innovation and entrepreneurship education needs to attach great importance to social responsibility, establish the social significance of medical innovation and entrepreneurship, and cultivate the social responsibility of medical innovation and entrepreneurship talents; 3) Promote global vision: Medical innovation and entrepreneurship education needs to promote global vision, guide students to pay attention to international medical development trends, and cultivate medical innovation and entrepreneurship talents with international vision [11]; 4) Strengthen practical teaching: Medical innovation and entrepreneurship education needs to strengthen practical teaching, so that students can master the methods and skills of innovation and entrepreneurship in practice, and cultivate the practical ability of medical innovation and entrepreneurship talents. The concept of innovation and entrepreneurship education needs to be updated from the four perspectives.

Second, the educational structure of innovation and entrepreneurship should be adjusted. Medical innovation and entrepreneurship education needs to establish a new educational structure. 1) Course structure: It is necessary to establish a complete course structure for innovation and entrepreneurship education, including theoretical courses and practical links, so that students can systematically acquire innovation and entrepreneurship knowledge and skills; 2) Structure of practical teaching platform: An innovation and entrepreneurship practice base needs to be constructed so that students can master the methods and skills of innovation and entrepreneurship in practice. The practice base should be equipped with advanced experimental equipment and office equipment to meet the practical and learning needs of students; 3) Guidance and support structure: The practice base is equipped with professional tutors and counselors to provide guidance and support for students in innovation and entrepreneurship [8]. Tutors and counselors should have the professional knowledge of medical industry and the ability of innovation and entrepreneurship to help students better apply the theoretical knowledge of innovation and entrepreneurship to solve practical problems; 4) Cultural atmosphere structure of innovation and entrepreneurship: Publicity and promotion of innovation and entrepreneurship should be strengthened to enable students to better understand the importance and significance of innovation and entrepreneurship and stimulate their enthusiasm for innovation and entrepreneurship. The existing education structure of innovation and entrepreneurship needs to be optimized from the four perspectives.

Third, a new model of innovation and entrepreneurship education should be constructed. Innovation and entrepreneurship education should seek new teaching models and establish new models of innovation and entrepreneurship education according to the characteristics and trends of medical industry. 1)

Integrated course teaching mode: Innovation and entrepreneurship education for medical undergraduates needs to be combined with traditional medical courses to form an integrated course teaching mode. By organically combining medical courses and innovation and entrepreneurship courses, students can learn about the theory and practice of innovation and entrepreneurship while acquiring medical knowledge, and apply it to the medical industry; 2) Practice-oriented teaching mode: Innovation and entrepreneurship education for medical undergraduates needs to be practice-oriented, and practical teaching should be included in the core content of innovation and entrepreneurship education. Through practical teaching, students can master the methods and skills of innovation and entrepreneurship in practical operation, and improve their practical ability and innovation ability; 3) Project-driven teaching mode: Innovation and entrepreneurship education for medical undergraduates needs to be project-driven, and project teaching should be included in the core content of innovation and entrepreneurship education. Through project teaching, students can experience the process of innovation and entrepreneurship in practical operation, and cultivate their innovative thinking and teamwork ability. By means of innovating teaching mode, medical science is organically integrated with other disciplines, and cross-border cooperation of medical innovation and entrepreneurship is promoted to improve students' comprehensive quality and innovation ability.

Fourth, innovation and entrepreneurship education quality needs to be improved. The competitiveness of medical student talent training is an important index for medical colleges to evaluate and improve the quality of innovation and entrepreneurship education. With the continuous development and progress of the medical industry, it is of great significance to improve the quality of innovation and entrepreneurship education for medical students [12]. 1) Mastery of medical knowledge: Medical students need to master solid medical knowledge, including basic knowledge and practical knowledge so that they are more capable to respond to the challenges and opportunities of the medical industry; 2) Innovative ability: Medical students need to have innovative ability, including innovative thinking, teamwork ability, market analysis ability and risk management ability. Only with solid innovation and entrepreneurship can medical students stand out in the medical industry; 3) International vision: Medical students need to have an international vision and understand the development trends and cutting-edge technologies of the international medical industry. Only when medical students have an international perspective can they compete in the medical industry on a global scale; 4) Strong social responsibility: Medical students need to have a sense of social responsibility and establish the social significance of medical innovation and entrepreneurship to become the backbone of the medical industry. Only by improving training quality for medical students can they better meet the needs of the medical industry, so as to promote the development and progress of the medical industry.

Fifth, new innovation and entrepreneurship education system should be improved. Firstly, in the medical education system, the theoretical setting of innovation and entrepreneurship courses should be increased to provide students with necessary knowledge and skills of innovation and entrepreneurship. By taking these courses, students can understand the basic processes and methods of starting a business, and apply what they have learned in practice. At the same time, curriculum should be adjusted according to the needs of students at different stages. Secondly, more innovation and entrepreneurship practice courses ranging from medical innovation to entrepreneurship should be added to the medical education system. These courses are practical, allowing students to learn by doing and develop practical abilities and problem solving skills. These practices should include but not be limited to getting students involved in innovation and entrepreneurship competitions, practical projects or internships in related companies or laboratories and encouraging students to participate in innovation and entrepreneurship associations and actively participate in related activities to better exercise their ability. Thirdly, universities are expected to establish cooperative relations with enterprises and the industry to promote the combination of industry, university and research and the development of medical innovation and entrepreneurship. By participating in practical projects at the base, students can better understand the actual situation of medical innovation and entrepreneurship and master relevant skills and knowledge, so as to better cope with future challenges. In addition, universities are also advised to strengthen the construction of teaching staff and train more medical teachers with innovative spirit. These teachers should have the knowledge and experience of innovation and entrepreneurship and be able to provide better education and guidance for students. Finally, great importance should also be attached by universities to international education. For instance, they can strengthen cooperation and exchanges with foreign colleges and universities, and introduce foreign excellent educational resources to improve the level of medical education. By taking above measures, the reform of medical innovation and entrepreneurship education will be promoted to train more medical talents and make contributions to the development of new medical sciences.

5. Summary

Based on the analysis of five new connotations of new medicine science, this paper proposed the innovation and entrepreneurship education concept of "planning medical development with new ideas, adjusting teaching resources with new structure, strengthening medical student training with new model, promoting medical education development with new quality, and leading medical education innovation with new system". According to the five new requirements, five reform strategies of education and teaching in the context of new medicine science were also put forward. The five new connotations and requirements are integrated and intertwined with each other, and such integrated and interweaving mechanism still needs to be further explored and applied in practice.

Acknowledgements

This paper is for the undergraduate Teaching Reform Project of Guangxi Higher Education in 2021, "Exploration on Innovation and entrepreneurship integration teaching Reform in medical colleges under the context of new medicine" (project No. : 2021JGA282); Exploration and Practice of Talent Training Mode of Medical Education, Production and Research in Medical Colleges in Ethnic Minority Areas in the Context of New Medicine Science (Project No. : 2019JGZ138); In 2021, the second batch of industry-university collaborative education project "Youjiang Medical University for Nationalities: Construction of ASEAN Innovation and Entrepreneurship Center" of the Department of Higher Education of Ministry of Education (Project No. : 202102120021), which is one of the phased achievements.

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