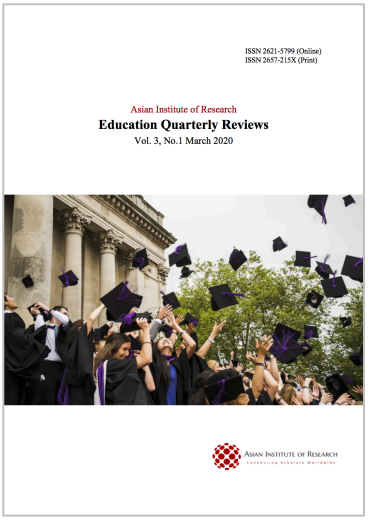

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Research on the Training Mode of Biology Talents Under the Background of Characteristic Subject Construction - Take Xinyang Normal University as an Example

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Abstract
The 21st century is the century of life science. With the rapid development of life science and technology, the social needs of biological professionals are changing dramatically, and the requirements for their theoretical quality and practical ability are becoming higher and higher. The construction of characteristic disciplines in Henan Province is advancing steadily, which is having a far-reaching impact on the talent cultivation of colleges and universities in the province, and the talent training mode of colleges and universities has also changed greatly. With the continuous expansion of the national undergraduate enrollment scale, it is of great theoretical and practical significance for local normal universities to cultivate biological professionals to adapt to the development of life science and social needs, and to explore a new model for the cultivation of biological professionals. Xinyang Normal University, based on the experience of biological talents training in the past 45 years, especially in the past five years around the construction of Henan Province's characteristic disciplines, focuses on the construction of "teaching staff, teaching team and practice team", focusing on improving the theoretical quality and practical ability of students majoring in biology, that is, a new training model of "one center, two improvements" for biological professionals. The new model has important theoretical significance and potential application value for the continuous improvement of teaching quality of biology education.

Keywords: Biology, Personnel Training, New Model, Characteristic Discipline

1. Construction of characteristic disciplines to promote the improvement of education level

In order to improve the comprehensive strength and international competitiveness of China's higher education, the Party Central Committee and the State Council made major strategic decisions to build a world-class university and a first-class discipline (referred to as "double first-class"), and in August 2015, they reviewed and approved the overall plan for promoting the construction of world-class universities and first-class disciplines as a whole, which was then printed and issued by the State Council, which decided to promote the construction of world one as a whole Second tier universities and first-class disciplines. In September 2017, the Ministry of education, the Ministry of Finance and the national development and Reform Commission jointly issued the notice on the announcement of the list of world-class universities and first-class discipline construction universities and disciplines, officially confirming the announcement of the first batch of "double first-class" construction universities totaling 140, 98 world-class discipline construction universities, and 465 "double first-class" construction disciplines. As a long-term development strategy of China's higher education reform, the "double first-class" construction plan encourages the differentiated development of disciplines, introduces dynamic competition mechanism, builds a new platform for the development of local colleges and universities, and provides new opportunities for development (Huang et al., 2019). In 2019, the Ministry of Education announced the list of national colleges and universities, 116 subordinate colleges and universities, 2798 local colleges and universities, that is, local colleges and universities accounted for 96.0% of the total number of national colleges and universities. Among the "double first-class" construction universities, there are 43 local universities, accounting for 33.6% of the total number of "double first-class" universities (Lin, 2019). Therefore, local colleges and universities play an indispensable role in the construction of "double first-class".

Henan province takes the initiative to connect with the national plan, seize the major opportunity of the national "double first-class" construction strategic deployment, create first-class disciplines, train first-class talents, and strive to achieve local high-end breakthroughs in higher education. Among them, Zhengzhou University and Henan University, as two first-class construction universities and two first-class construction discipline universities, were selected as "two first-class" in China. In 2015, the Department of Education and the Department of finance of Henan Province jointly issued the project implementation plan for the construction of advantageous and characteristic disciplines in Henan Province. From 2015 to 2024, 3.1 billion yuan is planned to be allocated to strengthen the construction of advantageous and characteristic disciplines in Henan Province. By 2024, about 5 disciplines will enter the ranks of "double first-class" in China, and about 10 disciplines will enter the forefront in China. The discipline level of colleges and universities in Henan Province will be significant He was promoted (Jia et al., 2016). The first phase of the construction project of advantageous and characteristic disciplines in Henan Province is from 2015 to 2019. There are 10 advantageous disciplines and 25 characteristic disciplines in the project, among which the Dabie mountain agricultural biological resources protection and utilization discipline group of Xinyang Normal University is selected as the construction list of characteristic disciplines in Henan Province (Table 1). From 2015 to 2017, Henan Provincial Department of Finance allocated a total of 1 billion yuan. From 2018 to 2024, it is planned to allocate 300 million yuan annually for the construction of advantageous and characteristic disciplines, which will inject strong impetus for the improvement of the overall level of higher education in Henan Province.

Table 1 The first phase of the construction project of advantageous and characteristic discipline in Henan Province (characteristic discipline)

Serial number	Name of school	Name of discipline (Group)
1	Zhengzhou University	Discipline group of "Central Plains history and culture"
2	Henan University of Technology	Discipline group of "food post-production safety and processing"
3	Zhengzhou University	"Cancer prevention and treatment" discipline group

Serial number	Name of school	Name of discipline (Group)
4	Henan University	Education
5	Zhengzhou University	Discipline group of "resource processing and efficient utilization"
6	Henan University	Discipline group of "Yellow River civilization"
7	Zhengzhou University	Discipline group of "engineering safety and disaster prevention"
8	Henan Normal University	Discipline group of "frontier physics and clean energy materials"
9	Henan University of Science and Technology	mechanical engineering
10	Henan College of Traditional Chinese Medicine	Traditional Chinese Medicine
11	Henan Agricultural University	agricultural engineering
12	Zhongyuan University Of Technology	Discipline group of "new textile and clothing materials and high-end equipment"
13	Henan University	"Nanomaterials and devices" subject group
14	Henan University of Science and Technology	Crop Science
15	Xinxiang Medical College	Discipline group of "psychoneuromedicine"
16	Luoyang Normal University	tourism management
17	Henan Polytechnic University	Surveying and Mapping
18	North China University of Water Resources and Electric Power	water conservancy project
19	Henan University of Economics and Law	Discipline group of "economic management and modern service industry"
20	Henan Agricultural University	Forestry
21	Zhengzhou University of Light Industry	Discipline group of "food science and Engineering"
22	Zhengzhou University of Aeronautics	Subject group of "aviation technology and economy"
23	Zhengzhou University	Discipline group of "consciousness morphology and social governance"
24	Henan University	Applied Economics
25	Xinyang Normal University	Subject group of "protection and utilization of agricultural biological resources in Dabie Mountain"

2. Local Normal Colleges and universities play an important role in the cultivation of biological talents

The 20th century is an era of rapid development of life science. Since the 1970s, the development of life science has been extremely rapid and has become one of the four pillars of science and technology that affect the future world (Chen et al., 2018). Especially in the last 20 years of the 20th century, the rapid development of life science and its related technologies is remarkable (Von et al., 2018; Ran et al., 2018). The 21st century is the century of life science, which will become the leading discipline of Natural Science (Itziar et al., 2019; Tian et al., 2019; Zhang, 2018). With the rapid development of life science and its related technologies, the demand for biological professionals is also constantly changing, and the scale of cultivation of biological professionals in China is also increasing (Fan et al., 2019; Wang et al., 2019). In May 2018, general secretary Xi Jinping delivered a speech at the forum of teachers and students in Peking University, pointing out: "at present, the scale and number of graduates of higher education in China have ranked first in the world. However, the expansion of scale does not mean the growth of quality and efficiency, and the path of connotative development is the only way for the development of higher education in China".

Since the expansion of enrollment scale in China's colleges and universities in 1999, the enrollment scale of undergraduate students has gradually expanded, and the number of students admitted by various colleges and universities has also increased year by year. However, the quality of student education has not been improved with the increase of enrollment, but has a downward trend (Wang et al., 2016; Zhou et al., 2010). In the 21st century, the most important thing is the competition of talents. Talents are the first resource. Whoever has high-quality, high-quality and innovative talents can lead the future (Yu et al., 2013). According to the data released by the Ministry of education, as of June 15, 2019, there are 2956 institutions of higher learning in China, including 2688 ordinary institutions of higher learning (including 257 independent colleges) and 268 adult institutions of higher learning. Among ordinary colleges and universities, the total number of engineering colleges, comprehensive colleges and financial colleges are ranked in the top three respectively, and the total number of normal colleges and universities is ranked in the fourth (Fig. 1). Among the nearly 200 normal universities in China, except for the six normal universities directly under the Ministry of education, the vast majority of the rest are local normal universities (Zhang et al., 2017), and most of the local normal universities are recruiting students majoring in biology. Therefore, these large numbers of local normal universities play a very important role in the cultivation of biological professionals in China.

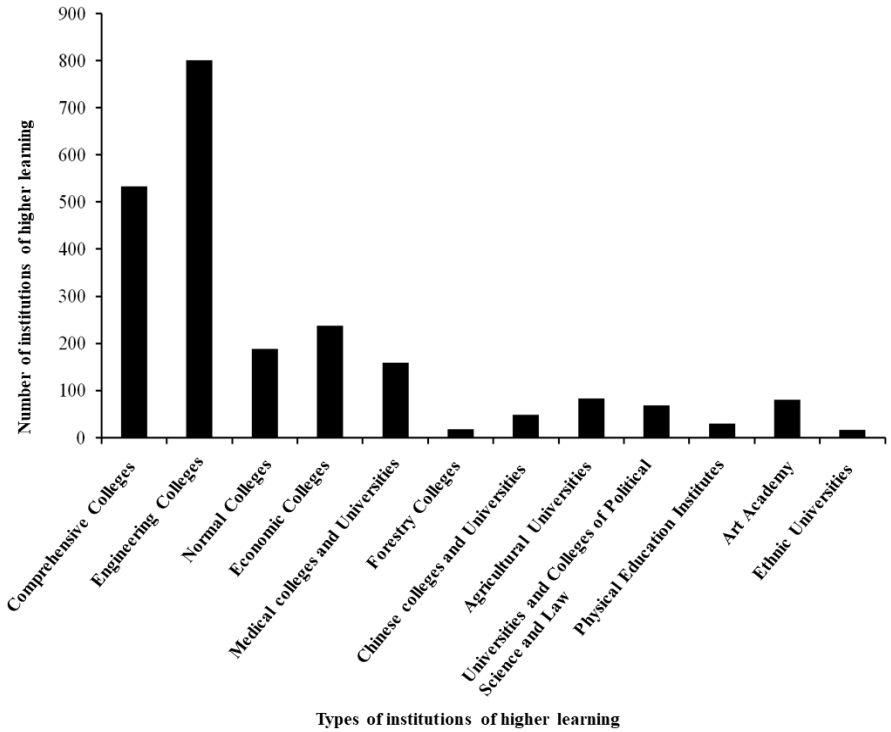

Fig.1 Number of different types of institutions of higher learning in China

3. The training mode of biology talents needs to be reformed urgently

In recent years, with the annual expansion of the enrollment scale of Local Normal Colleges and universities, it is urgent to improve the quality of students' training, adapt to the diversification of the demand for talent team of social development, and avoid the tendency of homogenization of students' training in similar normal colleges and universities (Gao et al, 2019; Zhang et al, 2017; Yang et al, 2015). At the same time, it is necessary to encourage local normal colleges and universities to explore and reasonably build a characteristic undergraduate talent training model, actively cultivate talents and their teams needed by the society (Xu et al, 2018), and strive to achieve the use of the best teachers to cultivate better undergraduates. Therefore, it is one of the main objectives of the current undergraduate training and education in local normal universities to build a new undergraduate training model and cultivate a talent team with strong innovation ability, solid theoretical foundation, outstanding practical ability and the ability to adapt to the requirements of today's economic and social development. Therefore, how to cultivate high-quality biological professionals to adapt to the development of life science and social needs in Henan Local Normal Colleges and Universities under the background of characteristic discipline construction has become an important issue to be solved by the majority of higher education managers and researchers (Chen et al, 2018; Guo, 2016). However, life science is a relatively practical discipline. The diversity of social needs and the characteristics of the development of biology specialty determine the importance and urgency of the cultivation mode and education reform of biology talents. According to the spirit of the 2018 National Education Conference and the 2019 national education working conference, this paper reexamines the cultivation of undergraduate talents, and finds that the main problems existing in the cultivation and education of biological talents in local normal universities are as follows:

(1) Unclear orientation and training objectives of biology major

At present, there are three main types of talent training objectives in China's Higher Education: ① scientific and technological innovation-oriented talents (key institutions); ② application-oriented talents (local undergraduate institutions) mainly based on scientific and technological development; ③ practical talents mainly based on skills training (Higher Vocational Colleges). In the stage of popularization of higher education in China, there are obvious differences in the requirements of the above three types of talents in terms of theoretical knowledge, practical ability and comprehensive quality (Xie, 2019; Chen, 2017). According to different professional fields, the specialty orientation and personnel training objectives of biology specialty are different. For example, according to the document requirements of the Ministry of education, the training goal of biotechnology professionals is to cultivate application-oriented talents. Therefore, the orientation, personnel training program, curriculum system and personnel training mode of biotechnology specialty should closely focus on the application-oriented personnel training. However, after expanding the enrollment scale in 1999, many local undergraduate colleges and universities began to enroll students of biology specialty without fully understanding the characteristics of biology specialty, and continued to expand the enrollment scale (Wang et al, 2019; Wu et al, 2019). As a result, the orientation of biology specialty is vague, the mode of talent cultivation is relatively single, the goal of talent cultivation is not clear enough, the orientation of disciplinary characteristics and application-oriented biotechnology specialty is ignored (Chen, et al, 2017), and the training of talents tends to focus on the cultivation of scientific and technological innovation talents in key universities, which leads to the fact that the training of talents can not meet the needs of social development for biology professionals.

(2) The cultivation of biological talents does not match the market demand

At present, more than half of the world's biological enterprises are concentrated in North American countries (such as the United States and Canada), and one third are located in Europe and Japan. The total scale of China's biological industry is less than 1% of that of the world. However, the number of graduates of biological specialty is up to tens of thousands every year. The enrollment scale of undergraduates exceeds the current demand of biological enterprises for biological talents, resulting in a great pressure on graduates of biological specialty to obtain employment (Jiang, 2019). However, under the condition of limited educational resources, its enrollment scale is too large, which will inevitably lead to the low quality of talent training and cannot meet the needs of the biological professional talent market (Chen et al., 2018). Biological enterprises need not only advanced R & D personnel, but also technical personnel with certain professional knowledge and skills. However, the

traditional biological professional education is characterized by discipline and research, which strengthens the theoretical level of students and ignores the cultivation and improvement of practical ability.

(3) Imperfect curriculum system planning

At present, most of the undergraduate education of biology major in local normal universities still stays in the traditional talent cultivation stage, and the cultivation mode is deeply influenced by the examination-oriented education, which leads to the fact that the graduates of biology major tend to attach importance to knowledge, knowledge, technology, ability, imitation and innovation (Lin et al., 2019; Zhang et al., 2019). In particular, the ability to find and solve problems by using biological professional knowledge is relatively lacking, the awareness and ability of innovation are lacking, and there is still a gap with the requirements of biological related enterprises for high-quality innovative professionals. At present, the curriculum of biology major in local normal universities is obviously imperfect, and there is a serious phenomenon that theory is more important than practice (Song et al., 2019; Gao et al., 2019; Ma et al., 2012). As a result, biology graduates can only "talk on paper" and have poor practical ability. Their understanding of knowledge floats on the surface and their practical ability is not strong. They can not combine theory and practice closely, especially the application of the knowledge they have learned in practice.

(4) Lack of linkage mechanism among institutions of higher learning, government and enterprises

Colleges and universities, governments and enterprises lack of communication and linkage mechanisms in talent training and demand. Although the number of jobs related to biological specialty provided by society is increasing every year, the number of graduates of biological specialty is far more than that provided by society (Xiang, 2019; Yang, et al., 2019); modern biological enterprises are not only in short supply of high-end biotechnology talents but also there is a gap between the knowledge mastered by graduates of biological specialty and the needs of enterprises, even if they are recruited Graduates of biology major still need to invest a lot of costs and long time to train them (Lang, 2019; Shi, 2019). Therefore, the employment of biology graduates is difficult at present. On the one hand, the increase of jobs provided by the society is limited. On the other hand, there is a lack of linkage mechanism between the government's enrollment policy for the college entrance examination, the talent training mode of colleges and universities and the market, and the training is out of line with the demand.

4. The new mode of biological talents training in Xinyang Normal University

Combined with the 45 years' work of the school of life sciences of Xinyang Normal University on the cultivation and education management of biological professionals, especially under the background of the construction of characteristic disciplines in Henan Province in the past five years, a new talent cultivation mode - "one center, two improvements" has been gradually constructed (Fig. 2). To explore the construction of the "faculty teaching team practice team" as the center, focusing on improving the theoretical quality and practical ability of biology students. The biggest characteristic of the new mode of biological talents training is that it can organically combine the talents training with the construction of teaching staff, teaching team and practice team, so that the construction effect of teaching staff and teaching and practice can be transformed into the valuable resources of biological talents training in time, effectively promote the improvement of students' theoretical quality and practical ability, and then comprehensively To improve the quality of biological talents training.

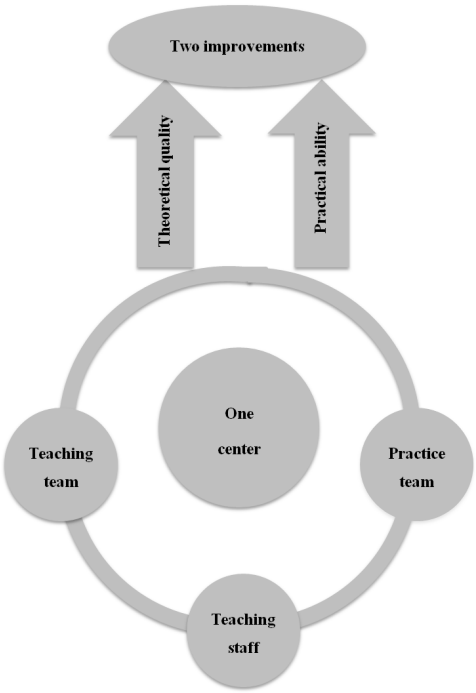

Fig. 2 New training mode "one center, two improvements" of biological professionals

Focusing on the improvement of the cultivation quality of biological professionals, we should continue to strengthen the construction of biological professional teachers, adhere to the combination of introduction and cultivation, improve the management mechanism of teachers, promote teachers to update their educational concepts, improve teaching methods, reasonably build a knowledge structure system, and strengthen the construction of theoretical teaching teams. At the same time, we should innovate the cooperative education mechanism, improve the selection and employment of undergraduate tutors outside the University, constantly strengthen the construction of practical teaching base and education practice base, and strengthen the cultivation of practical ability of biology students. At the same time, strengthen the construction of teaching team and practice team, so as to effectively improve the quality of personnel training and promote the high-quality cultivation of biological professionals. Innovation of the current training mode of biological talents can continuously improve the theoretical quality and practical ability of biological students.

The quality of personnel training is the lifeline of undergraduate education, and the level of teachers, teaching and practice team construction is the key to determine the quality of biological talent training. The core task of undergraduate education is to cultivate innovative talents with high quality. However, the lack of innovation ability of biology graduates is a common problem in the cultivation of biology talents. Therefore, the scientific and reasonable construction of "one center, two improvements" cultivation mode of biology professional talents, that is to say, it is the foundation of improving the theoretical quality and practical ability of biology professional students to focus on the construction of "teaching staff teaching team practice team" closely, take the construction of teaching staff as the center, take the construction of teaching staff as the leader, and pay attention to the introduction, cultivation, education, and training of excellent talents; strengthen the teaching The construction of team and practice team, the renewal of education idea, the improvement of teaching method, the construction of reasonable knowledge structure system, the continuous strengthening of the construction of practice teaching base and teaching practice base, the strict selection and employment of off-campus guidance teachers, the promotion of mutual communication, the construction of communication platform, and the continuous improvement of theoretical quality and practical ability of biology students through the cooperation and collaborative innovation of school and College The effective way of force. Therefore, it is of great theoretical and practical significance to scientifically and rationally build a new model of "one center, two improvements" for the cultivation of biological professionals.

Therefore, the "one center, two improvements" new mode of biological professional talents training constructed by the school of life sciences of Xinyang Normal University can make full use of the advantages of excellent teachers' resources inside and outside the school, as well as the advantages of teaching team and practice team guidance, and can promote the cultivation of biological professional talents with characteristics, representativeness, and promotion and application value.

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