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Exploration and Practice of Classification Talent Training Model in Local Agricultural Institutes

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Abstract: ***With the rapid development of modern society, the demand for professional talents in the veterinary industry is increasing and showing a trend of diversification. In order to better adapt to this change and meet the industry's demand for high-quality and versatile veterinary talents, the reform of traditional veterinary professional education is particularly urgent. Taking Shanxi Agricultural University as an example, the veterinary specialty of a local agricultural university actively explored and implemented the "2-2-4" classified talent training model of "three stages, three modules and seven links". This innovative model divides veterinary education into three learning stages, each with targeted teaching modules, and ensures the systematic transmission of knowledge and comprehensive cultivation of skills through seven specific teaching links. In this way, the model effectively solves many problems in traditional teaching, such as weak professional awareness among students, insufficient teacher-student interaction, single ability cultivation among students, and disconnection between teaching and research. It emphasizes the close integration of theory and practice, emphasizes students' active participation and innovation ability cultivation, thereby significantly improving the quality of talent cultivation. In addition, this reform practice of Shanxi Agricultural University not only provides a broader development space and employment opportunities for veterinary students in our university, but also provides useful reference and inspiration for the educational reform of veterinary majors in peer universities. Its successful implementation proves that emphasizing innovative teaching models and diversified talent cultivation in veterinary education is an important way to improve education quality and meet social needs. Therefore, this model has important promotion value and is expected to cultivate more high-quality talents with innovative spirit and practical ability for the veterinary industry.***

Keywords: Local Agricultural Universities; Veterinary Medicine; Classified Talent Training; Exploration; Practice.

1. INTRODUCTION

Veterinary medicine is not only a component of modern life science but an important part of agricultural science in China. Its fundamental mission and objective are to guarantee the sustainable development of the animal husbandry industry, promote the health and wellbeing of animals, improve the quality of animal derived food, maintain public health and environmental safety, and protect human health. [1] Currently, great changes have taken place to the public's demand for talents of the Veterinary Medicine Major with the continuous increase in the types and scale of raised animals, increasingly complex incidence and prevalence of animal diseases, the increasingly serious impact of zoonotic diseases on the society, the frequent occurrence of animal derived food safety accidents, the sharp increase in the number of pets in cities, and the delay in pet veterinary services, etc. And higher requirements have been proposed for the talent training of the Veterinary Medicine Major in terms of thinking, abilities, organizational management, communication means, professional ethics, humanistic quality, basic veterinary knowledge, clinical skills, and so on. Local agricultural universities shoulder the mission of developing high-quality agricultural science and technology talents for the local and even the whole country and play an important role in serving local social and economic development. When training talents, local agricultural universities should fully meet the needs for talents and diversified talent development in local social and economic development and formulate classified talent training models that meet diversified talent development needs in combination with their school-running orientation and disciplinary advantages. [2]

Shanxi Agricultural University is a famous agricultural institution of higher learning in China. It was one of the 99 key universities in the country in the initial stage of China's reform and opening-up. In more than 100 years of development, this university has made important contributions to the social and economic development of the local and even the whole country. It is a highly representative and typical local agricultural university. The Veterinary Medicine Major is one of the traditional competitive majors of the university and also one of the first national first-class undergraduate majors, national characteristic majors, provincial brand majors, and provincial competitive majors. In recent years, Shanxi Agricultural University has actively explored the classified talent

training model in the Veterinary Medicine Major by fully following the law of higher education and the law of talent growth and meeting the public needs for talents and diversified talent development, receiving a good result.

As a leading player in the field of veterinary education in China, Shanxi Agricultural University's veterinary education has demonstrated a profound foundation and outstanding achievements in its development history, teaching characteristics, scientific research achievements, and social contributions. Since its establishment in 1922, this major has carried the important mission of cultivating high-quality veterinary talents and promoting the progress of veterinary technology. After nearly a century of trials and tribulations, it has developed into a comprehensive discipline system integrating teaching, scientific research, and social services. The history of the veterinary program at Shanxi Agricultural University can be traced back to the early 1920s, and it is one of the earliest higher education institutions in China to establish a veterinary program. Over the past century, this major has continuously accumulated a profound academic foundation and rich teaching experience. At present, the profession has a teacher team led by national and provincial teaching masters, with a reasonable structure and excellent quality. They not only have profound knowledge in theoretical teaching, but also have rich experience and significant achievements in clinical practice and scientific research. Several teachers have edited or participated in the compilation of national unified textbooks for higher agricultural colleges and several influential monographs on anatomy, pathology, etc., contributing significant efforts to the development of veterinary education. Shanxi Agricultural University's veterinary major relies on the advantages of the school's first-class disciplines and characteristic majors, and has built a complete curriculum system and experimental teaching system. The major has multiple research directions covering basic veterinary medicine, preventive veterinary medicine, clinical veterinary medicine, and other fields. It has master's and doctoral degree authorization points, providing students with broad learning and development opportunities. In addition, the major also has high-level scientific research and teaching platforms such as provincial key laboratories and experimental teaching demonstration centers, providing students with good experimental conditions and practical opportunities.

In terms of professional characteristics, the veterinary major at Shanxi Agricultural University emphasizes the combination of theory and practice, emphasizing the cultivation of students' practical and innovative abilities. The major offers a variety of experimental courses, including animal anatomy, animal physiology, animal pathology, veterinary microbiology, etc. Through experimental operations, case analysis, and other methods, students' hands-on and problem-solving abilities are improved. At the same time, the major actively collaborates with enterprises, breeding farms, and other organizations to establish off campus internship bases, providing students with more practical opportunities and employment channels.

2. INTRODUCTION TO THE CLASSIFIED TALENT TRAINING MODEL OF VETERINARY MEDICINE MAJOR IN SHANXI AGRICULTURAL UNIVERSITY

On the basis of the original basic medicine, preventive medicine, and clinical medicine, veterinary medicine has formed animal pharmacy, animal pharmaceutical engineering, animal quarantine and inspection, small animal medicine, environmental and veterinary sciences, and other emerging disciplines. Additionally, amid the constantly changing demands of the modern society for veterinary medicine professionals and the gradually expanding employment direction of such professionals, it is urgent to carry out profound reform on the talent training model of the Veterinary Medicine Major at agricultural universities. Under the support of the Project of Reform and Practice of Veterinary Medicine Experimental Teaching and Practical Teaching under the 21st Century Higher Agriculture and Forestry Teaching and Education Reform Program launched by the Ministry of Education in 2000, the Veterinary Medicine Major of Shanxi Agricultural University has identified its “5-1-1-1” staged talent training model for the Veterinary Medicine Major. Specifically, “5” refers to students’ theoretical learning in the 1st to 5th semesters; the first “1” refers to the comprehensive teaching practice of students in the 6th semester; the second “1” refers to the second theoretical learning of students in the 7th semester and the last “1” refers to students’ production internship in the 8th semester.

Originally, the "5-1-1-1" staged talent training model was piloted in the Veterinary Medicine Major of Shanxi Agricultural University. Later, in order to better meet the public’s demand for veterinary medicine professionals and needs for diversified talent development, this university discussed the training model of veterinary medicine professionals in 2010 based on the revised talent training program in 2004 to intensify the effort of talent training program reform. A consensus was formed on the implementation of the classified talent training model. In 2013, it was required by the Ministry of Education, the Ministry of Agriculture, and the State Forestry Administration that

“it is necessary to "vigorously promote comprehensive reforms to form a multi-tiered, multi-type and diversified senior talent training system for agricultural and forestry education with Chinese characteristics”. Shanxi Agricultural University follows the laws of higher education and talent growth and conforms to the needs for the national veterinary system reform and social and economic development. It has established and implemented a training model system for veterinary medicine professionals with multiple links closely interrelated and multiple directions coordinated based on students' individuality, ability, interest and social needs for veterinary medicine talents at different levels. Finally, the three-stage, three-module, and seven-link "2-2-4" talent training model has been established.

In the three-stage, three-module, and seven-link "2-2-4" classified talent training model, “three- stage” means three stages of training students must go through, namely general education, basic education, and professional education; “three-module” means the skills-oriented talent training module, the research-oriented talent training module, and the management-oriented talent training module, among which students should select one for learning when they undergo the professional education stage; “seven-link” means clinical skills training and clinical thinking training for skills-oriented students (two links), basic research training and independent innovative experiments for research-oriented students (two links), and veterinary management knowledge training, preliminary training on the official veterinary system, and preliminary training on the enterprise management system for management-oriented students (three links) upon students’ selection of the three modules. For “2-2-4”, the first “2” refers to general knowledge education for students in the first to second semesters; the second “2” refers to basic knowledge education for students in the third to fourth semesters; and the last “4” refers to professional knowledge teaching and diverted learning according to different training objectives in the fifth to eighth semesters: undergraduates who select the skills-oriented training are expected to develop into clinical application skills-oriented talents with the qualification of practicing veterinary medicine; those who select the research-oriented training are expected to develop into research-oriented talents with the potential to engage in scientific research; and those who select the management-oriented training are expected to develop into management talents with innovative thinking who meet the needs of China’s official veterinary system reform, modern enterprise organization and management, animal production, new countryside construction, etc.

3. TEACHING PROBLEMS SOLVED BY THE CLASSIFIED TALENT TRAINING MODEL OF THE VETERINARY MEDICINE MAJOR OF SHANXI AGRICULTURAL UNIVERSITY

In order to meet the demand for veterinary professionals in modern society, Shanxi Agricultural University's veterinary program continues to explore and innovate teaching models, and has established a "5-1-1-1" animal medicine talent training model, which is a five-year undergraduate education. The first four years are theoretical learning and experimental teaching, and the last year is internship and graduation project. This model aims to cultivate students' professional quality and practical ability through systematic theoretical learning and practical exercise.

In professional teaching, the veterinary major at Shanxi Agricultural University emphasizes teacher-student interaction and collaborative learning, advocating the experimental teaching mode of "interactive collaboration". Teachers guide students to actively participate in experimental design, data analysis, and result discussion, stimulating their interest and initiative in learning. At the same time, the major also encourages students to participate in scientific research projects and academic activities, cultivating their research literacy and innovation ability.

3.1 Students’ awareness of the major

Compared with the students of other agronomy majors in Shanxi Agricultural University, the Veterinary Medicine Major enjoys a higher first-choice application rate. Students are aware of this major, which is not enough, though. In the three-stage, three-module, and seven-link "2-2- 4" classified talent training model, general education is offered to students in the first and second semesters to improve their cognitive ability, humanistic quality, as well as moral and ideological level; and basic education is offered to students in the third to fourth semesters to develop their basic science knowledge related to the development of veterinary medicine and the basic theoretical knowledge of veterinary science. The general education in the two semesters of the freshman year and the basic education in the two semesters of the sophomore year can effectively solve the problem regarding students' basic awareness of the Veterinary Medicine Major. In the first semester of the junior year, students can be divided into

different types of learning according to different training objectives and based on students' personalities, interests, abilities, and self-development needs. The three types of students, namely skills- oriented, research-oriented, and management-oriented types, rely on different carriers of implementation and offer practice feedbacks, which can effectively solve the problem of students' insufficient awareness of the major.

3.2 Teacher-student interactions

As its long-lasting problems, the education of the Veterinary Medicine Major pays more attention to knowledge than ability, to theory than practice, to academic performance than quality. Teachers mainly impart knowledge in teaching and have difficulty in understanding the educational needs of students with different goals. In this case, an awkward situation occurs: Teachers blindly give lectures and students passively listen in the classroom. The three-stage, three-module, and seven-link "2-2-4" classified talent training model can give full play to the leading role of teachers in teaching and the role of students as participants in learning. In this way, teachers can understand the key points and focus of teaching and students can get the key points and focus of learning. This can effectively solve the problems of activeness and passiveness of teachers and students during the entire teaching process, thus enabling more effective teacher-student interactions.

3.3 Development of students' abilities

In the traditional talent training model, the practice of formulating unified training goals and programs and implementing unified teaching standards in each major ignores the individual differences among students, making it difficult to meet the diversified requirements of the society and the industry for graduates. [3] The three-stage, three-module, and seven-link "2-2- 4" classified talent training model adopted for the Veterinary Medicine Major of Shanxi Agricultural University can improve the core competitiveness of students in a targeted way based on the ability requirements for different students. For the training of skills-oriented talents, activities such as university-enterprise joint contribution, entrepreneurs giving lectures, participation in the prevention and control of animal epidemics in Shanxi Province, special skills training and competitions can be organized to develop the skills and thinking of undergraduates. For the training of research-oriented talents, based on the disciplinary advantages of the school and the broad stage of the National Veterinary Medicine Experimental Teaching Demonstration Center, a tutorial system is adopted for some students of the Veterinary Medicine Major. Students participate in research projects throughout the process and apply for and complete independent innovative experiments to consolidate theoretical foundations, refine scientific thinking, and improve research skills. For the training of management-oriented talents, specialized training for undergraduates can be organized at the level of veterinary management science. Students are required to have sufficient ideological reserves in terms of management methods, system building, system operation, and system implementation from the perspective of innovation to develop into veterinary management talents.

3.4 Teaching-research integration

Teaching and research are inseparable and merge with each other. Teaching-research integration has become a consensus in the academic community. [4] In the three-stage, three- module, and seven-link "2-2-4" classified talent training model, for research-oriented talent training, teachers can offer feedback to teaching through research and integrate the latest research results and academic frontiers to teaching to broaden students' academic horizons. It can be said that teachers' research involves teaching. For skills and management-oriented talent training, teachers can promote research through teaching. They can impart knowledge in teaching on the one hand and promptly discover and solve problems during the teaching process on the other hand. So, it can be said that teachers' teaching involves research. Thus, in this talent training model, the merging of teaching and research can effectively solve the problem of the separation between teaching and research and further promote the mutual integration of the two.

4. INNOVATIONS OF THE CLASSIFIED TALENT TRAINING MODEL OF THE VETERINARY MEDICINE MAJOR AT SHANXI AGRICULTURAL UNIVERSITY

4.1 Highlighting individuality, teaching students in accordance with their aptitude, and training talents through classification

The three-stage, three-module, and seven-link "2-2-4" classified talent training model can give full play to the leading role of teachers in teaching and the role of students as participants in learning, which can effectively solve the common and individual problems met in education. In the talent training model reform, students can have their common problems solved by receiving general education and basic education, thus obtaining basic knowledge reserves. During the stage of diverted learning, students are divided into three modules, namely skills, research, and management, for classified training according to talent training goals and the different demands of students. And different carriers of implementation are adopted to improve the core competence of different types of students. The skills-oriented undergraduate training model mainly trains clinical application skills-oriented talents with veterinary practice qualifications. By receiving systematic clinical skills and thinking training, students can better master traditional veterinary skills and new technologies in the field of modern veterinary medicine. The research-oriented undergraduate training model is mainly designed to train research talents with the potential to engage in research. Through tutor guidance and systematic training, this model aims to help students lay theoretical foundations, refine scientific thinking, and improve research skills, thereby developing and reserving talents for veterinary medicine research. The management-oriented undergraduate training model mainly aims at training management talents with innovative thinking who are required in China's official veterinary system reform, modern enterprise organization and operation, animal production, new countryside construction, etc.

4.2 Closed-loop design, dynamic adjustment, model application

The three-stage, three-module, and seven-link “2-2-4” classified talent training model is a systematic project with distinct characteristics on the whole. The three stages of general education, basic education and professional education (diverted learning) are an organic unit with a shared goal of enhancing the core competitiveness of students and improving the quality of talent training. Based on the closed-loop design of the talent training model, keeping pace with the times is another feature of this model. It is necessary to make timely adjustments to the talent training model according to changes in the public’s needs for graduates majoring in veterinary medicine, changes in the employment direction, problems with veterinary medicine education, and the requirements for abilities of veterinary medicine professionals so as to adapt to various changes and needs. Through gradual exploration and practice, this model can gradually improve the quality of talent training and meet the diversified demands of the society for veterinary medicine professionals and students’ demands for diversified development, which can be modeled from, replicated and promoted.

5. APPLICATION EFFECT OF THE CLASSIFIED TALENT TRAINING MODEL IN THE VETERINARY MEDICINE MAJOR OF SHANXI AGRICULTURAL UNIVERSITY

5.1 Application effect of the classified talent training model of the Veterinary Medicine Major Remarkable achievements have been made in the long-term application practice of the classified talent training model. Students have performed well at school and developed better upon graduation.

Academic performance of different types of students when they are at school is described as follows. A total of 379 skills-oriented students have engaged in internships and practice on the production lines of animal husbandry and veterinary enterprises. The in-depth university- enterprise cooperation has entered a substantive stage, with a total of 83 students having participated in the university-enterprise cooperation projects. A total of 46 students have won the special prize, first prize, and second prize of national professional skills competitions. A total of 21 research-oriented students have been approved for national, provincial and university-level innovation and entrepreneurship training programs for college students, with 27 academic papers published in total. A total of 13 students have won first and second prizes in provincial innovation competitions. The admission rate of the research-oriented students participating in the postgraduate entrance examination has been on the rise year after year. In 2021, this figure (only for fresh graduates) exceeded 60%. Among the admitted students, over 30% entered China Agricultural University, Northwest Agriculture and Forestry University, Nanjing Agricultural University, Huazhong Agricultural University, and other "double first-class universities". Among management-oriented students, 216 students have participated in the training of management-oriented courses, 31 worked as interns at government agencies such as local animal husbandry and veterinary bureaus, animal husbandry and veterinary service centers, and veterinary health supervision departments, and 107 as interns in industrial enterprises.

Development status of different types of students upon graduation: A total of 314 skills- oriented graduates serve industry-related enterprises, of which 192 have developed into the technical backbone of these enterprises. The

institutions where research-oriented graduates are admitted to master's degree majors are highly satisfied with these students, who complete basic research ability training within a short period of time and master the basic methods and operations for research, with a great potential for research. Many management-oriented graduates work in government agencies such as local customs, provincial entry-exit inspection and quarantine bureaus, and local animal husbandry and veterinary bureaus. Among them, 36 students are responsible for the management and training of employees for their enterprises and 79 serve as intermediate-level managers in industrial enterprises.

5.2 The promotion effect of the classified talent training model for the Veterinary Medicine Major

Through long-term exploration and practice, the classified talent training model can be modeled from, replicated and promoted.

Attention from the university on the classified talent training model: The three-stage, three- module, and seven-link “2-2-4” talent training model has received extensive attention from leaders and teachers of other teaching units of Shanxi Agricultural University in charge of teaching work. Leaders in charge of teaching, the dean of academic affairs, and other vice deans in charge of the teaching of this university have paid attention to this model and rated it high several times. Greatly inspired by the classified talent training model, some teachers have applied this model to teaching, actively applied for related projects, and successfully gained project establishment support at different levels.

Attention from outside the university on the classified talent training model: The classified talent training model is designed in response to the existing problems in veterinary education and the requirements for abilities of veterinary talents. Shanxi Agricultural University has taken the lead in introducing the three-stage, three-module, and seven-link "2-2-4" module among peer universities, receiving extensive attention and recognition from Chinese experts and professors. This model has been modeled from in the training of veterinary medicine professionals at other agricultural universities and gained good results.

6. CONCLUSION

The three-stage, three-module, and seven-link “2-2-4” classified talent training model of the Veterinary Medicine Major at Shanxi Agricultural University fully meets the talent needs and needs for diversified talent development of society. The classified training of skills, research and management-oriented students has significantly improved the talent training quality and received good teaching results. It can be modeled from, replicated, and promoted by veterinary medicine education at peer universities.

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