

## Research on Teaching Reform and Innovation of Veterinary Clinical Diagnostics in Agricultural Universities

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**Keywords:** Veterinary clinical diagnostics, Teaching reform, Teaching innovation, Agricultural universities

**Abstract:** Veterinary clinical diagnostics is a required basic course for the major of animal medicine, providing basic theories, knowledge and skills for the diagnosis of diseases. This paper makes some advices on the course teaching from the aspects of course content system reform, teaching mode reform and teaching practice reform. The purpose is to improve the teaching effect of this course and provide reference for the cultivation of veterinary talents in agricultural colleges in China.

### 1. Reform of Course Content System

Veterinary clinical diagnosis is an important basic professional course. It is the introduction of clinical courses and the bridge of the transition from basic courses to professional courses. Through the study of this course, students should fully realize the importance of combining theory with practice, and gradually master the basic knowledge and skills of veterinary clinical diagnosis, so as to make a preliminary diagnosis of diseases. This course mainly describes the basic methods and sequence of clinical examination and the examination of animal hair skin and related tissues [1]. And the diagnosis of various systemic diseases, including lymphatic system examination, circulatory system examination, respiratory system examination, digestive system examination, urinary system examination, reproductive system examination, motor system examination, nervous system examination and sensory organ examination [2]. Traditional diagnostics of veterinary clinical teaching process, curriculum content part is 'teaching is given priority to, more still to check "syndrome, recognition, distinguishes between" theoretical explanation is given priority to, because of the veterinary clinical diagnosis of curriculum knowledge is various, the students are busy taking notes, class did not grasp the essence of diagnosis and clinical practical skills [3]. In course teaching, we changed the teaching method. In the classroom, we used multimedia to introduce the diagnosis process of specific cases diagnosed by veterinarians in the form of video, audio and animation. On the basis of multimedia teaching, we will list the knowledge points of each chapter on the blackboard, so as to sort out the general theory and the content of each part of the knowledge points. This improved method is more helpful for students to better grasp the course content and the specific application in the production process.

In the part of teaching the general theory and each theory of veterinary clinical diagnostics, we adjusted the teaching plan according to the actual needs of the society and the school in Beijing. For example, in the part of teaching skin and visible mucous membrane examination, we used to explain the color changes of mucous membrane and skin of important animals. Through the reform, we will show the collected clinical cases of dogs and cats to students in the form of video or pictures, so that students can discuss the key to diagnosis on their own. We found that through the multimedia presentation of specific cases and in combination with Beijing While discussing the typical cases in the regional pet hospital, on the one hand, it increased the students' enthusiasm for learning, on the other hand, the students had a good chance to exercise in the process of disease diagnosis of small animals. As the saying goes, "seeing is better than hearing". In the teaching process of veterinary clinical diagnosis, we combine the unique resources of Beijing area to teach clinical diagnosis of small animals. At the same time, we use the actual case pictures and videos to combine with classroom discussion. This teaching method is more intuitive and profound than the

direct oral teaching method. Students are easier to understand and remember. Teaching The effect is better than the traditional "full irrigation".

## **2. Reform of Teaching Mode**

### **2.1 Application of "Rain Classroom" in Teaching**

With the rapid development of information technology and the increasing intelligence of educational technology, "rain classroom" has been widely used in the teaching of various subjects. "Rain Classroom" is a smart teaching tool launched by Tsinghua University in 2016, whose functions are based on PPT and WeChat. The school of animal science and technology of Beijing agricultural university started to advocate the use of "Rain Classroom" by teachers of animal medicine major in the second half of 2017, and by the first half of 2019, more than 10 professional courses have been used. Application "Rain Classroom" teaching can send related courses to students prepare before the class content, such as teaching based on past experience, the cardiovascular system diagnosis is the students think learning difficult chapters, we will be in class for class and class of cardiovascular diagnosis related video sent by rain class for the students to preview before class. This method is better than the previous method through the network disk or sent to the class leader to grasp the students' pre-class preview completion and students can send the difficulties in the process of preview to the teacher. Before teaching, students can print out the courseware and relevant learning materials, and only need to make summary notes in class. This method improves the students' title rate and teachers' interaction to some extent. In addition, "rain classroom" can increase the interaction in classroom teaching, for example, students can interact with questions at any time, quickly calculate the selection ratio of answers, and conduct targeted analysis and explanation [4]. Students can express their views and questions at any time. Compared with the previous classes without interaction, students can better interact with teachers to learn the contents of each chapter of veterinary clinical diagnosis.

### **2.2 Introduction of PBL Teaching and Case Teaching Mode**

PBL (problem-based learning) teaching method is also known as the problem-based teaching method. This teaching method is mainly based on the problem, student-centered, and combined with specific cases to put forward the problem, establish the hypothesis, collect data, demonstrate the hypothesis and review the summary of five basic links [5]. PBL teaching has some applications in the teaching of veterinary clinical diagnosis [6]. For example, in the first section of the first chapter of the veterinary clinical diagnosis, the basic content of the clinical examination, the previous lectures followed the methods of inquiry, visual diagnosis, palpation, percussion, auscultation and olfactory diagnosis to carry out the teaching in a straightforward way, and the effect is often the lack of interest and motivation of students. In the reform, we list these six basic clinical examination methods in the form of key words and questions in blackboard writing, so that students can change their roles: playing the role of doctors and owners of sick animals, teaching PBL and cases through students' combination of specific cases and role exchange. In this process, the relevant contents are from dull concept to practical and specific The combination of cases has achieved the mastery and understanding of knowledge, made students' thinking in a positive and active state, and enhanced the cultivation of students' divergent ability and independent learning ability [7]. At the same time, in the process of PBL and case teaching, combined with "rain class" teaching, the initiative of the whole class was stimulated, and the logic of the students' clinical thinking was improved.

### **2.3 Invitation Pet Clinicians Into the Class**

With the growth of economy, clinical pet doctors can bring students more latest cases on the clinical front line, and have continuous diagnosis and treatment process, which can stimulate students' enthusiasm for learning veterinary clinical courses. Veterinary medicine; Clinical diagnosis of course invited clinical pet doctors to give the students of class lectures, can improve

the students interest in learning this course.

### **3. Teaching Practice Reform**

Veterinary clinical diagnostics is the link between clinical professional courses, is a practical course [2]. Based on the characteristics of modern agricultural and forestry higher education in Beijing agricultural university and the breeding mode in Beijing, it is far from enough to confine the practical course of veterinary clinical diagnosis to the model diagnosis of large animals. At the same time, we took our classmates to visit the referral center of pet hospital and the major animal hospitals in Beijing to learn the diagnosis and treatment methods of specific cases of small animals in practice. During the learning process, students came into contact with the instruments that could only be seen in textbooks. They learned the application of small animal nuclear magnetism and CT and other precision instruments in the diagnosis and treatment of related diseases and the interpretation of results. This combination gives students a more intuitive understanding of how veterinarians, especially pets, diagnose diseases.

### **4. Reform of the Examination of Veterinary Qualification**

Since 2010, the vocational veterinary qualification examination in China has been carried out nationwide [8], which is also an important process for China's veterinary system to be in line with international standards. According to statistics, there are about 299 knowledge points of veterinary clinical diagnostics required to be mastered in the outline from 2010 to 2017, and the comprehensive application of specific knowledge points in clinical diagnostics in clinical subjects accounts for about 20% [9]. In combination with "rain class", we input the relevant knowledge points and exercises of the vet examination into the PPT of each chapter. After class, we push them to the students in the form of questions and assignments, and sort out the knowledge points according to the common and difficult problems, so that the students can not only master the knowledge points, but also combine the relevant content of the vet qualification examination Learning. According to the syllabus of the National Veterinary qualification examination, combined with the geographical location and school running characteristics of Beijing Agricultural College, we revised the syllabus in time for the students majoring in animal medicine, updated the contents of the examination, increased the proportion of the examination for clinical case analysis and practice, and at the same time, we changed the final examination choice of veterinary clinical diagnosis into an objective single choice of one out of five, so that we can cultivate Of the students meet the requirements of urban agricultural development and practicing veterinarians.

### **5. Reform of Assessment Methods**

Curriculum assessment should be able to objectively evaluate students' learning effects and test teachers' teaching quality. The reform of veterinary clinical diagnostics including grades, test scores, experiment report, but not to evaluation of the whole process of students. The score of the theory course is not limited to the result of the final exam paper. After the reform, we adopted two methods: 1) Adding subjective questions to the exam paper, focusing on the combination of students' daily experimental operation and theory; 2) The performance of student group discussion was added to the theory course to stimulate students' discussion and the potential of diagnosis and analysis of specific cases. Through our reform, the assessment method of the diagnosis part is detailed as shown in Figure 1.

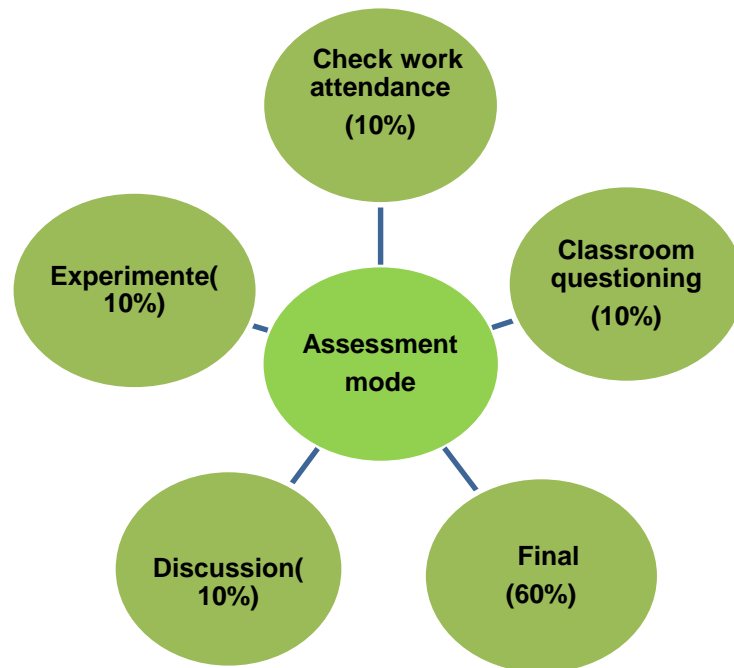


Figure 1 assessment method of veterinary clinical diagnostics

## 6. Conclusion

Above is what we do-- some teaching reform attempts in veterinary clinical diagnosis of course. We are in the process of the reform of the college and the strong support of the school, we also, summarizes the problems encountered when learning the course, collecting students' opinions, improve teaching methods. We hope to reform the teaching of veterinary clinical diagnostics, not only to make students learn the course well, but also to teach students the learning methods.

## Acknowledgments

This study was supported by youth science foundation of Beijing agricultural university [grant numbers SXQN201904], and the connotation development quota university student scientific research training project [kx2019008].

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