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THE EXPLORATION OF ANIMAL PHYSIOLOGY COURSE CONSTRUCTION

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Abstract:
In order to adapt to the modernization of education and the development of education in colleges and universities, it is necessary to reform and explore the course system, organization and clinical practice of animal physiology curriculum, and to strengthen the software and hardware construction of the course. Focusing on the student-centered principle, we plan to maximize the effective use of modern information technology and improve the outcome of teaching process. We aim to help students grasp the knowledge, at the same time, pay attention to the cultivation of students' comprehensive capabilities.

Keywords: animal physiology course; construction; education technology

1. Introduction

With the advent of the twenty-first century, the whole world is discussing and carrying out a new round of education and teaching reformation to cultivate knowledgeable, capable, and innovative talents to achieve the modernization of education. Looking forward to the modernization of education in the new century is assumed that the new education should have the following main features: it should be transformed from the traditional teacher-oriented education to student-centered education. While emphasizing on students "learning" knowledge, it emphasizes more on the cultivation

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of students' abilities (Barr & Tagg, 1995; Fry et al., 2008). In addition, it will make the full and effective use of modern information technology to carry out teaching activities. As a fundamental course of animal science and other related disciplines in animal agriculture, the construction of Animal Physiology course needs to meet the standards of education modernization and globalization. We have managed to implement course construction from three main aspects with some good experiences and achievements.

2. Animal Physiology Course Construction

2.1. Adjusting the content and organization of teaching based on the curriculum content structure, and strengthening the training of students' ability through the reform of practical teaching content

a. Course content and teaching system

Course content and teaching system are two key and difficult parts for teaching reform. Animal physiology is an important professional course of animal medicine and animal science. It is not only related to the direction of animal medicine and animal science development, but also to the quality of personnel training (Feder, 2005; Martinsen & Jukes 2005). In 2005 after acknowledging Animal physiology as the top course construction projects of the school, we first identified our central idea as quality improvement of teaching, and basic principles as cultivation of students' innovative consciousness, innovative thinking and innovation ability. At the same time, we paid attention to individual education and personality training, in order to adapt to the development of society on the needs of comprehensive talents, and to adapt to China's higher education reform and development.

Secondly, we focused on the integration, optimization and innovation of the logic, content and structure of the animal physiology curriculum and curriculum system, highlighting the cultivation of students' capabilities. And through the cross-fusion of animal physiology courses with anatomy, histology, pathophysiology, pharmacology and other pre-and post-courses, we improved the old single-course system in which the teaching content was too small, narrow and repetitive.

Thirdly, we correctly handled the relationship between improving students' professional knowledge, working ability and comprehensive capability, and paid extra attention to the cultivation of students' innovative consciousness and innovation ability. We managed to improve the students' basic experimental skills and practical experience according to the characteristics of different professionals. Based on this ideology, we improved the revision of the teaching plan, and completed the theoretical syllabus, experimental syllabus and experimental teaching guidance for the whole school.

b. The organization of teaching content

In terms of teaching content organization, we used a comprehensive principle. Animal physiology as a fundamental course of animal science, animal medicine and other professional courses, unlike the later parts of the professional curriculum which are constrained by the subject system, can be organized more innovatively and freely, so as to construct a more rigorous knowledge system with structural level and logical order. The whole framework of knowledge content can be constructed according to the logic of knowledge and student cognition.

Secondly, considering the order of learning process itself, the knowledge content in the front can set foundation for the later ones, we can scatter difficult points and form a reasonable knowledge span. Animal physiology knowledge is consisted by the introduction, blood physiology, circulation physiology, respiratory physiology and other twelve chapters. Each section of the knowledge has relatively deep and shallow parts. But generally, the morphological structure is an easy part to understand. Therefore, we can organize teaching content from shallow to deep, from simple to complex, from specific to abstract and from the macro to micro.

Thirdly, teaching can be done horizontally. The relationship between animal physiology and the knowledge of the pre - and later curriculum can be analyzed. We can put forward the overlapping parts of the relevant disciplines and the universally applicable concepts and laws to establish the structure of the knowledge network, and to form some internal links between the knowledge modules.

Fourthly, teaching can be done from the whole to the part, from the general concepts to individual points. The most general point will be first taught, and the ongoing differentiation will be based on specific contents. Students in a variety of learning environments will be provided fixed points of knowledge structure.

c. Reform of Teaching Content

The course group has been constantly reforming the practical teaching content, strengthening the cultivation of students' ability and establishing a scientific and rational teaching system with the objective of personnel training and fulfilling the needs of talents from social and economic development.

Four levels of experimental teaching content system are set up:

- Course and curriculum design: To let students master the basic experimental principles of animal physiology, basic experimental skills, the use of basic experimental equipment and become familiar with the basic approach of conducting comprehensive experiments.
- Combination of the professional clinical practice: To combine the teaching content with the production practice such as animal disease prevention and treatment.

- Establishment of "Undergraduate research and innovation fund": To recruit some capable students to start scientific researches under the guidance of teachers in order to train students' innovative capabilities.
- Extracurricular activities and social practice: To increase extracurricular activity parts including skill contests, competitions, social services and practice to expand the students' knowledge and improve the overall capabilities of students.

We aim to cultivate students' clinical capability and experimental ability, and constantly reform the practical teaching content system and strengthen the quality control of all aspects of practical teaching, so that students can gain the systematic experimental technology and operational skills to make good personal achievements.

2.2 Improve the teaching conditions and strengthen the curriculum construction

The teaching materials are gradually implemented. We are the editors of the educational material of National Agriculture and Forestry College, "Animal Physiology Network Course" (Higher Education Press, 2005).

After the construction of the course, in addition to the purchase of relevant teaching reference materials, teachers will list the reference books and require students to get from the library as the curriculum expansion and extension at the start of courses. Teachers in the course group often carry out research on teaching materials and discuss the organization of teaching contents, the selection of professional teaching materials and the designation of reference books. They combined the use of planning materials with self-compiled materials to improve teaching outcomes. We also established and improved teaching documents, and ensured the success of curriculum construction from the system and policy perspectives. We have made numerous efforts to strengthen the teachers' training, so as to promote successful development of the teaching and research.

2.3. Using modern education ideology and information technology to effectively carry out teaching methods and teaching media reform

a. The reform of teaching methods

In terms of the reform of teaching methods, in the past few years, we have changed the traditional teaching pattern which we purely instill knowledge in the classroom into the implementation of heuristic teaching and classroom discussion. The main purpose of teaching in the classroom is to clarify ideas, highlight the focus and guide the thinking process.

- Transformation from knowledge inculcation into inspiration

For chapters difficult to understand by students, we flexibly supplemented traditional teaching by heuristic teaching method, which is, leaving pre-class doubts, solving doubts during class and leaving questions after class.

- Case-based classroom discussion

In the animal physiology teaching, we appropriate introduced clinical cases, which is not only helpful for students for understanding and mastery of physiological knowledge, but also for them to apply their knowledge and figuring out the purposes of learning these materials (Hmelo-Silver, 2004; Newman, 2005).

- Cultivating students' self-learning ability

For some content that cannot be taught during limited classroom time but must be mastered by students, teachers will point out the self-learning focus and precautions, and students use own time to conduct self-study. After self-study, small practice or pop quiz will be given to students to evaluate the outcome of self-study, and to ensure the quality of teaching.

- Combination of the basic animal physiology theory and new scientific discovery

Teachers in the classroom will appropriately introduce some new knowledge and discovery of the study field to make up for the limitations of old textbooks and disadvantages of long cycle of textbook updates.

b. The reform of teaching media

Animal physiology is different from other disciplines because of its abstract and continuous, dynamic changes. We use multimedia technology, to express and conceptualize many abstract physiological theory and dynamic processes. We show image graphics, especially animations in front of students, so that the leaning points become more prominent, and complicated concepts become simplified. We produce a large number of two-dimensional animation and a small amount of virtual reality experimental content. In the production, we strictly follow the scientific principles, making the abstract physiological theory into visible and specific things, which is conducive for students to develop image thinking and deepen understanding. Based on this technology, we also developed network-based learning and self-evaluation tests.

In the course of teaching, we present the key learning points in the form of animation in the multimedia classroom. With multimedia network, students use the electronic reading room to carry out self-study, review and self-test as a means of interaction. Students can leave online messages and use other means of communication to interact or discuss class topics, which can effectively improve the initiative and enthusiasm of students to learn. Therefore, the outcome and quality of teaching are significantly improved, and this is widely welcomed and recognized by teachers and students.

3. The main features of animal physiology courses

Several years of curriculum construction and teaching reform has helped us form some of our own characteristics:

A. We use computer and network technology to assist teaching. Through a large number of self-produced animations, we expressed complex abstract theoretical content and experimental process in a vivid, simplified but professional way. Students can conduct self-test, self-evaluation or communication with teachers in a timely manner via the campus network. Over the past few years, we properly handled the relationship between modern educational technology and traditional teaching. We learned from both methods and adopted their respective advantages.

B. We advocate carrying out problem-based learning by combining teaching with clinical and production practice to develop students' independent learning ability, as well as group form of collective learning for team spirit training.

C. We focus on the reform of teaching and researching with outstanding achievements. We have hosted a number of provincial and school-level teaching reform topics.

4. Conclusion

Animal Physiology course is oriented towards the future, the world and the actual production process. It reasonably and effectively adopted the modern technology and significantly improved the teaching outcome. Teaching has gradually transformed from the traditional knowledge inculcation into the current student-centered, problem-centered teaching pattern, supplemented by classroom discussion, online or SMS Q & A. It strengthened the comprehensive capabilities of students, and significantly improved quality of teaching.

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