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EXPLORATION OF INNOVATION AND PRACTICE OF SHORT VIDEO TEACHING IN ANIMAL IMMUNOLOGY COURSE

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Abstract: With the advancement of educational informatization, educational modernization has become an inherent requirement for building an educational power. This paper aims to explore the innovative practice of short video teaching in animal immunology courses and analyze its effects in improving teaching quality, stimulating students' learning interest, and cultivating core literacy. By concretizing abstract knowledge points, short video teaching not only makes complex animal immunology knowledge easier to understand, but also improves teaching effectiveness through online teaching resources.
Keywords: Information-based education; Animal immunology; Short video teaching; Innovative practice; Online teaching

1 INTRODUCTION

In the context of educational informatization, traditional teaching models face many challenges. Taking animal immunology courses as an example, this paper explores the innovative practice of short video teaching in improving teaching effectiveness, stimulating students' learning interest, and cultivating core literacy. By concretizing complex theoretical knowledge through animations and videos, short video teaching not only changes students' learning habits of passively accepting knowledge, but also optimizes teaching content through instant feedback [1].

2 PAIN POINTS OF TRADITIONAL TEACHING

2.1 Single Teaching Method Leads to Loss of Students' Interest in Learning

The traditional teaching model is teacher-centered, the classroom design is rigid, and students passively accept knowledge for a long time, which easily leads to loss of learning interest and lack of problem-solving ability. For complex and abstract courses such as animal immunology, traditional face-to-face teaching is difficult to stimulate students' interest in learning and curiosity.

2.2 Teaching Model is Limited by Time and Space

Take Northeast Agricultural University as an example. The animal immunology course has only 32 hours. Teachers can only explain the theoretical knowledge in the textbooks within a limited time, which makes it difficult to guide students to expand their knowledge and diverge their thinking, affecting the cultivation of students' thinking ability and exploration spirit.

2.3 Teaching Resources cannot be Repeated and Stored

For courses such as animal immunology that are abstract, complex in theory, numerous in concepts, and rapidly advancing in the frontier, it is difficult for students to firmly grasp the knowledge points and have a deep understanding within the limited offline classroom time. Students can only rely on courseware and notes after class. Lack of teacher guidance and explanation, the cold two-dimensional picture content will test students' understanding and learning ability more, and easily cause the break of knowledge connection [2].

3 ADVANTAGES OF SHORT VIDEO TEACHING INNOVATION

3.1 Short Video Teaching Stimulates Students' Interest in Learning

Surveys show that more than 90% of college students have the habit of watching short videos, nearly 70% of users have used it for more than one year, and more than 2/3 of users have important behavioral characteristics such as daily login. Short video teaching has obvious entertainment value. It quickly introduces knowledge points to students through short videos, supplemented by voice explanations and music, so that students can feel an immersive experience, which is easier to stimulate students' curiosity and interest in learning, and deepen their understanding and memory [3].

3.2 Solve the Problem of Time and Space Limitations in Traditional Classrooms

Traditional classrooms are greatly restricted by time and space, while short video teaching can complement each other

through the organic combination of online and offline. Students can start the learning mode through their mobile phones, which not only allows students to make full use of fragmented time, but also greatly improves their enthusiasm for learning. In addition, the short video teaching method improves the repeatability of knowledge points. Videos can be watched repeatedly, and the impression is deepened through continuous learning. The comment area also provides all students with the opportunity to ask questions, which is open and long-term effective, reducing the difficulty of students' learning and cultivating students' active learning ability [4].

3.3 Strengthen Teacher-Student Interaction and Improve Teaching Quality

Good teacher-student interaction helps improve teaching quality. The traditional classroom teaching model is a one-to-many one-way teaching model. Due to teaching time constraints, teacher-student interaction can only be individual questions and answers, and teachers cannot take care of all students. Insufficient communication between teachers and students will also limit the degree of students' knowledge mastery. One of the most notable features of short videos is strong interactivity. Through teacher-student interaction, students can understand and improve their grades, thereby improving their learning ability. Most importantly, the information left by learners in the comment area can be seen by teachers at the first time, and teachers can answer questions at the first time. If students still don't understand something, they can continue to ask questions, and teachers can also answer again in a short time. Such teacher-student interaction is two-way, greatly improving feedback efficiency and saving a lot of time for teachers and students [5].

3.4 Concretize Abstract Content to Help Students Understand Difficulties

The biggest teaching bottleneck of animal immunology is that the content is abstract and difficult to understand, and students are prone to lose interest and initiative in learning. The intervention of short videos, in the form of short stories, relevant movie clips explanations or animated demonstrations, decomposes complex content, concretizes abstract knowledge, makes boring concepts interesting, and diversifies single texts. Through the organic combination of pictures, text, sound and images, students' interest in learning is enhanced, the difficulty of teaching content is reduced, and students' understanding and memory are deepened. Short videos show the most essential and effective part of knowledge in just a few minutes, which is easier to understand than mixed and redundant knowledge systems. In addition, short videos solve the shortcomings of traditional classroom knowledge that cannot be stored and repeated. Students can watch key and difficult knowledge repeatedly, thereby improving the quality and effectiveness of teaching.

3.5 Online "Cloud Ideological and Political Education" Makes Up for the Shortcomings of Offline Ideological and Political Education

Course ideological and political education aims to integrate university ideological and political education into all aspects of course teaching, and realize moral education and subtle nourishment. Animal immunology teaching short videos can make up for the shortcomings of classroom ideological and political education and guide students to establish a correct world outlook, outlook on life and values. By combining current events related to immunology with patriotism, telling inspiring stories of scientists, introducing the latest discoveries and technologies at the forefront of science, guiding students to think deeply, resonate with ideas, improve students' curiosity, learn the rigor of scientists in exploring the essence of life, and let students learn to be strong and optimistic in a subtle way, and cultivate high-quality talents with patriotism, dedication, integrity, friendliness and responsibility [6].

3.6 Short Video Teaching Improves the Speed and Breadth of Knowledge Dissemination

Due to its short and fast characteristics, short videos usually do not have too much prelude and preparation. They directly show the most useful parts in a limited time, thus shortening the time to master knowledge. At the same time, knowledge dissemination in the form of short videos uses social networks as a bridge and spreads rapidly in a fragmented dissemination environment. For previous teaching methods, it is relatively difficult for non-school personnel to understand the high-quality courses of colleges and universities. Short videos have the characteristics of a wide audience area. Non-school personnel can obtain relevant information and knowledge by simply tapping the screen, realizing the high popularization of university knowledge. In addition, due to the low threshold for short video production, everyone has the opportunity to become a "missionary". Students can also record their daily life, interesting experiences, etc. through short videos, and teachers can also assign homework in the form of short videos [7].

4 INNOVATIVE TEACHING PRACTICE OF SHORT VIDEOS IN ANIMAL IMMUNOLOGY

4.1 Teaching Content is Easy to Understand

The teaching team breaks down the content of animal immunology chapters into several knowledge points, produces short videos of different knowledge points, and sets topics according to the content. For example, in the immune cell theme, different immune cells are given specific roles, such as missile engineer lymphocyte B cells, senior intelligence officer dendritic cells, thousand-faced warrior monocytes, big eater neutrophils, etc. Through exquisite and vivid

animations and humorous and easy-to-understand explanations, the knowledge points become easy to understand, which is more conducive to students' understanding and memory. The role of complement is a complex and abstract process, and students lack association and in-depth understanding in classroom teaching. In the nonspecific immunity theme, complement and antigens are designed as animated cartoon characters with different label characteristics, vividly showing the complex process of complement clearing antigens, and abstract immune molecules are designed as specific cartoon characters, which is convenient for students to understand and deepen their memory. In order to make up for the limited classroom time and the lack of ideological and political education, the teaching research team incorporates ideological and political elements into each short video [8]. For example, in the vaccine theme, focus on the hot issues of vaccine safety that the public is concerned about. By introducing the different types and advantages and disadvantages of severe pneumonia vaccines around the world, the safety and reliability of vaccines are scientifically explained, and everyone is encouraged to actively get vaccinated and contribute their own "help" to society. The short video also lists the experience of Academician Zhong Nanshan and Academician Li Lanjuan in fighting severe pneumonia, which subtly enhances students' patriotism and national pride.

4.2 Innovative Teaching Methods

4.2.1 Short videos throughout the teaching process

Short videos are used as an important teaching tool before, during and after class. Taking the course "The Past and Present of Vaccines" as an example, before class, we use the online cloud teaching platform to publish learning tasks, let students watch short videos, understand the history, concepts and types of vaccine research, stimulate students' learning interest, familiarize themselves with knowledge points, and let students draw mind maps based on the self-study content of short videos to summarize vaccine types and their application scope. Through students' answers, we can understand whether they have achieved low-level teaching goals. In class, we introduce current hot topics, movie plots or historical events in short videos to trigger in-depth thinking, and initiate group discussions or debates on the principles of use and advantages and disadvantages of different types of vaccines to cultivate students' thinking, innovation and teamwork ability. After showing the students' achievements, teachers will comment and improve, inject immune awareness of green and healthy breeding, and achieve high-level teaching goals through student-teacher evaluation. After class, students actively feedback their thoughts and feelings in the short video comment area and redraw mind maps. Teachers will review and summarize teaching based on feedback content, and continuously optimize and improve teaching content and teaching design.

4.2.2 Students make short videos to achieve the goal of ability training

In order to evaluate students' learning effects and cultivate students' independent research and teamwork abilities, students select knowledge points of animal immunology in groups and shoot short videos. By consulting literature, designing scripts and obtaining materials, students design popular science short videos of immunology with their own characteristics, which fully demonstrate the innovation ability of contemporary college students and the absorption effect of animal immunology knowledge points [9]. Teachers and students anonymously score the quality and popularity of each group's short videos and include them in the regular grades. Every semester, students' short video works will be displayed on the short video account, enriching the teaching content and stimulating students' enterprising spirit and curiosity.

4.3 Diversification of Teaching Evaluation

Traditional teaching evaluation is mainly based on the final evaluation, and often "determines life by the test paper". This teaching team focuses on process evaluation and evaluates students' learning effects in a diversified and multi-dimensional way, so as to have a high degree of insight into the quality of course teaching. The evaluation content includes not only the evaluation of the mastery of basic theoretical knowledge, but also a comprehensive evaluation of learning attitude and knowledge application ability. In terms of learning ability, students' enthusiasm and initiative in daily classes are mainly evaluated. The score is based on the number and duration of short videos watched by students in the background, the number of comments, the number of questions answered in class, the degree of cooperation with teachers, attendance and sign-in, etc. This part accounts for 10% of the total score; in terms of basic theoretical knowledge, a final closed-book exam is used for scoring. Questions that simply tested knowledge points in the past have been changed to analytical questions combining current events and cases, or thinking and extension questions that use the knowledge learned to solve existing problems. This part accounts for 50% of the total score; in terms of knowledge application ability, the main evaluation includes the quality of short videos produced by flipped classroom groups, the explanation of demonstration links, and evaluation based on group participation and contribution. This part accounts for 40% of the total score [10].

4.4 Short Video Platform Big Data Feedback to Optimize Teaching Content in Real Time

Teaching feedback is the teacher's response to students' learning needs based on the satisfaction of students' curiosity in classroom teaching. Especially in the current "student-centered" learning concept and learning environment, teaching feedback has become a key link in improving the quality of teaching in colleges and universities. After the introduction of short videos, students' learning status and learning effects are mainly understood through the comment area and big data feedback results in order to adjust teaching content and teaching methods. Due to the openness of short videos,

students can leave their feelings and concerns about immunology knowledge in the comment area at any time. Teachers analyze students' interest and attention to immunology knowledge based on data such as comment content, video views, likes and collections, and make real-time optimization and adjustments in the production and classroom explanation of subsequent short videos. Record videos with many views, high likes and excellent viewing time. These video contents need to be explained in class and expand relevant knowledge. The style of these videos is usually the most acceptable and watchable to students, and can be used more in subsequent videos. Information technology has a natural advantage in information feedback. With the help of "Internet technology", it can obtain more extensive information at "any time, any place, anyone"; with the help of "computer technology", it can provide "real-time, accurate, objective and diverse" teaching status feedback; at the same time, information technology can shorten the information feedback time, allowing teachers and students to control the teaching process in time, adjust teaching strategies, and ultimately play a very important role in achieving teaching goals. Making full use of information technology for teaching feedback is an indispensable and important link in the process of teaching reform and innovation.

5 EFFECTS AND RESULTS OF INNOVATIVE PRACTICE

5.1 Promotion and Promotion of Short Video Accounts

This teaching team has established the first immunology popular science video account on the "Douyin" platform. At present, the number of fans has exceeded 10,000, the number of likes has exceeded 50,000, the number of views of each video has exceeded 10,000, and the highest number of views of a single video has exceeded 40,000. In addition, this teaching video account has been recognized by the official platform of "Douyin" and has been invited to participate in the Gaozhi Sharing Program to help promote and popularize science video accounts. Short video teaching practice is not only popular among students of this major, but also has received attention and love from fans ranging from elementary school students to those in their fifties and sixties. Some fans left messages saying that after watching our teaching short videos, they developed a strong interest in immunology, which accelerated the dissemination of immunology knowledge and deepened the public's love for immunology knowledge.

5.2 Feedback on Student Learning Effects

After a semester of study, students have a systematic grasp of immunology knowledge, and have also cultivated students' patriotism, dedication, and good qualities of distinguishing right from wrong. Through the innovative teaching method of short videos, students have mastered different learning habits. They can open their mobile phones to learn new knowledge; ask questions, interact and help each other; forward videos and share learning resources. Each short video incorporates ideological and political elements, which increases students' awe of heroes, confidence in the country and love for the motherland.

6 CONCLUSION

In short, this teaching team follows the requirements of today's information-based education and normalized management, and introduces short videos into the animal immunology course for innovative teaching practice. Although short video teaching increases the difficulty of teachers' work and poses great challenges to teachers' personal abilities, the editing ability of the teaching team, teaching resources and students' consciousness, it can effectively make up for the shortcomings of traditional teaching, improve the teaching quality of animal immunology, improve teachers' teaching skills, and improve the breadth and speed of knowledge dissemination. The short video teaching method can be extended to other related courses, thereby improving the teaching quality of higher education, promoting the modernization of education, and effectively cultivating new-era talents with lofty ambitions, noble character, outstanding talents and great responsibilities.

7 RESEARCH DIFFICULTIES

There are two difficulties in this study. The first difficulty is about the problem-oriented hierarchical breakthrough teaching method. How to combine the requirements of ability training and the cognitive laws of students, scientifically design levels of different difficulty and complexity, and meet the requirements of the "two sexes once" golden course. Since the knowledge, ability and literacy of students in each class will show dynamic changes, by designing levels of different difficulty and complexity, the impact of such dynamic changes on teaching can be weakened or eliminated. However, to achieve the talent training positioning of vocational undergraduates, the design of level issues and the joint participation of industry personnel are necessary. The second difficulty is to refine typical work tasks and professional abilities, and accurately locate knowledge, ability and literacy. Since knowledge, ability and literacy will also show dynamic changes with the development of industries and industries, teachers need to update the knowledge, ability and literacy goals of the course according to the changes, and the corresponding teaching content, teaching resources, teaching methods, teaching design and teaching evaluation must also change accordingly. In order to achieve this, teachers should keep up with the dynamic changes of new industry norms, new products, new technologies, new processes and new methods. In addition to online resource channels, teachers should also actively participate in various trainings of regulatory authorities and industry organizations, and strengthen communication and exchanges with

enterprises through school-enterprise cooperation and other means. The author believes that these two difficulties are the key to the successful construction of the "Golden Course" of Immunology for vocational undergraduates, and are also the parts that need to be continuously studied and improved in subsequent course teaching.

Teaching methods such as teaching content based on industry and positions, BOPPPS teaching model based on OBE concept, problem-oriented breakthrough method, and course ideological and political education to promote teaching and reasonable evaluation methods have stimulated students' learning interest, enhanced their learning motivation, improved their thinking and problem-solving ability, cultivated innovative thinking, and realized professional teaching at the undergraduate level. In general, the exploration and research on the construction of the "Golden Course" of Immunology for vocational undergraduates has achieved the expected results and has good feasibility. The research results can be used as an effective way to build the "Golden Course" for vocational undergraduates.

COMPETING INTERESTS

The authors have no relevant financial or non-financial interests to disclose.

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