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Research on the Reform of Biological Experiment Teaching in Colleges and Universities

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ABSTRACT. *As a course content based on experiments, the biological experiment course of colleges and universities should focus on the students' innovative thinking and practice level. For the current development of biological experiment courses in colleges and universities, there are still many problems such as imperfect evaluation system, unreasonable curriculum setting and unregulated laboratory management. This paper will point out the existing problems in the teaching of biological experiments in colleges and universities, and propose countermeasures for targeted reforms.*

KEYWORDS: *Colleges and universities; Biological experiments; Teaching reform*

1. Existing problems in biological experiment teaching in colleges and universities

1.1 The teaching concept lags behind the experimental teaching

At present, in many areas of China, many educators are obsolete, backward, and light in theory. The experimental courses of many courses are basically attached to the corresponding theoretical courses. The dominant idea of this model is to carry out experimental teaching for the verification, consolidation and deepening of theoretical knowledge, as well as biological experiment teaching. The school only grasps the rate of the experimental class, does not ask the quality, the experimental teaching is subordinate to the theoretical teaching position, a few teachers do not have the proficiency of experimental skills, the status of the laboratory staff is low, the work is not at ease, in the management of experimental teaching, experimental staff There is no effective management system for team building.

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1.2 Guiding ideology is not suitable for training objectives

Influenced by the concept of experimental teaching attached to theoretical teaching, biological experimental teaching has long lacked an independent complete syllabus and teaching plan, without a clear teaching position and purpose; no complete experimental teaching system objectives; lack of experimental teachers Basic tasks and quality requirements; no measures for the main role and ability of students. The purpose of the student's experiment is not clear enough. There is a phenomenon that is only satisfied with the completion of the experimental content, rushing to do the experiment, and only pursuing the experimental speed and not seeking the experimental effect. Therefore, in the experimental ability and method, there is no systematic training and training, and at the same time it will be misleading, which will make students have a wrong understanding of experimental teaching and seriously affect the development of students.

1.3 The experimental content is not rational enough.

At present, in the teaching reform, often only pay attention to the reform of the curriculum system of the theoretical course, and the experimental teaching reform is relatively lagging behind. In the field of biology, there are two problems: First, the existing experimental teaching content, experimental projects are outdated, demonstrative and confirmatory experimental projects are too many, comprehensive and design experiments are few, and the content and purpose of experimental teaching Today's high-tech technologies are far apart, causing the disconnection between experimental teaching and social services, scientific research, and production. Second, in the experimental courses of different courses, there are some basic experiments repeated in multiple experimental courses, leading to students. Repeated, mechanical repetitive operations, such experiments do not make any sense to students.

1.4 teaching methods are old and boring

In terms of teaching methods, many teachers have adopted the practice of explaining experimental items, detailed experimental principles, instrument materials lists, experimental procedures, data recording forms, and even precautions to students in the course of experimental teaching. This is actually telling the students through the whole process of the experiment. Students can complete the experimental tasks as long as they “take the medicine”, but they do not need to check the information, think and innovate[1]. This kind of teaching mode is difficult to give play to students' subjective initiative. It is difficult to cultivate students' ability to discover problems, analyze problems and solve problems, and to innovate. It obviously does not meet the requirements of knowledge economy for the knowledge, ability and quality of qualified talents.

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1.5 Laboratory management is not standardized

In recent years, although colleges and universities have done a lot of work in laboratory safety management, they still have frequent safety accidents. The reason is that there are loopholes in the safety management system. The system has not been implemented, and the responsibility is not specific to people. Relevant security measures have not been kept up in time, and biological experiments in universities involve a large number of biochemical reagents. A considerable part of them are dangerous chemicals. There are many potential safety hazards in terms of purchase, storage and use. In addition, although many colleges and universities have increased their investment in laboratory construction at this stage, both instrumental facilities and scientific research projects have been greatly improved, but the infrastructure of safety facilities has not been followed up, and the research platform has been tilted seriously. The room, equipment and capital investment in the room are obviously insufficient.

2. College biology experiment teaching reform countermeasures

2.1 Change the concept of teaching and establish an independent experimental teaching system

To meet the needs of innovation education in the 21st century, we must re-understand the status and role of university laboratories. In fact, university laboratories are an important base for personnel training and teaching and research[2]. They are a symbol reflecting the level of teachers, scientific research and management in colleges and universities; they are the cradle of the birth of new knowledge, new technologies, new methods and new achievements. More importantly, it is a classroom that fosters students' diligent and realistic scientific attitudes, stimulates students' desire to explore innovation, and enhances their ability to comprehensively innovate. It is not difficult to understand that the laboratory for talent training is an important place for innovative education. In view of its status and role, it is necessary to increase the management and structural adjustment of university laboratories, change its long-term subordinate status, and establish a relatively independent experimental teaching new system, so that the development of laboratories can adapt to the needs of innovative education.

2.2 Play a unique course with unique experimental teaching functions

For biology teaching, experimental teaching has its unique role, because biological science is an experimental-oriented discipline, biological experiment teaching has its own scientific, systematic and cohesive, so biological experiment teaching is necessary to be independent. Set up classes. Independent experiment setting can improve the status of experimental teaching, and get rid of the situation that experimental teaching is subordinate to theoretical teaching. Experiments are set up independently, which is convenient for scientific management of experimental

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teaching, which is conducive to the laboratory open to students; experimental teaching independently sets classes. A separate examination must be conducted, which can arouse students' attention to the experiment, thus changing the students' theory of theory and practice. The experiment can set up the course independently[3], and it can also guarantee the experimental time, prevent the phenomenon of theoretical teaching run-time experiment teaching, and ensure the biological experiment teaching. Systematic, cultivates students' ability to observe problems, analyze problems and solve problems, and innovate spirit, thus improving the quality of experimental teaching

2.3 Adjusting experimental teaching content combined with practical application

On the one hand, experimental teaching is an important part of cultivating applied talents. The experimental content should be combined with practical applications, combined with current new technologies, closely following the latest developments in scientific research, and introducing advanced production techniques and scientific research results into experiments as much as possible. In the teaching, the experimental teaching is advanced, representative and directional, in order to avoid the phenomenon of "educational lag, students are late"; on the other hand, according to the requirements of the training objectives, the experimental content is integrated, some duplication and verification are deleted. Sexual experiments, increase comprehensive, design, research experiments, give full play to students' subjective initiative, and guide students to carry out experimental design and complete the experiment according to certain experimental goals.

2.4 Reforming Teaching Methods and Cultivating Students' Independent Innovation Spirit

Establish a student-centered experimental teaching model and give students more freedom in experimental teaching. For example, the laboratory implements semi-open management or open-ended teaching, allowing students to enter the laboratory at any time during the open hours of the laboratory without affecting others' experiments[4], to prepare reagents, prepare experimental instruments and redo or Make up an experiment or conduct an innovative experiment. This open teaching form can meet the requirements of students' design experiments with innovative thinking and greatly motivate students' learning autonomy.

2.5 Strengthen the management of biological experiment teaching laboratory

Develop a laboratory management system and a clear and complete responsibility system aiming at the safe and efficient operation of laboratories. Improve the operation specifications of teaching laboratory instruments and equipment, realize standardized operation, strengthen the safety management of procurement, storage and use of pharmaceutical reagents, and implement classified management double poisoning for toxic, flammable and explosive drugs, and all

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drugs should be recorded and used. To achieve standardized management of biological laboratory systems.

3. Conclusion

In short, in the face of the new situation of higher education in the new century, we must quickly change our mindset, truly attach importance to biological experiment teaching from the ideological point of view, and reform and innovate in experimental teaching systems, experimental content, and experimental teaching methods.

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