

Some Thoughts on the Current Teaching Reform of Biochemistry

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Abstract: The teaching reform of biochemistry is one of the most important topics in biochemistry research and education. With the development of bioengineering and molecular diagnosis technology, a biochemistry curriculum that can reflect and meet the needs of the 21st century is needed. This course should cover all relevant disciplines, from molecular biology to cell biology, genetic engineering and metabolic engineering. These disciplines all have their own core issues, but they need a cross integration of courses that can reflect the needs of the current era, but also have appeal and adaptability. Based on the author's years of biology teaching practice, this paper analyzes the main problems in biochemistry teaching and put forward the countermeasures.

Keywords: University; Biochemistry; Teaching research methods

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Introduction

Biology teaching is an important way to impart biological science and technology knowledge to students, and also an important way to train students' scientific thinking. When teaching basic biological knowledge, biology curriculum should focus on cultivating students' ability to solve practical problems by using biochemical theories and methods. The improvement of this abilities will help improve students' scientific thinking and scientific research and technology development level. However, under the traditional teaching mode, the training of students' practical ability and innovation spirit is often ignored. Although students can master certain biological knowledge through classroom learning, problems such as the disconnection between biological theoretical knowledge and practice, and poor application effect often occur in practical application. Therefore, combining the theory of biochemistry with the application of technology can not only meet the current needs of training biology talents, but also stimulate students' interest in the research and learning of biological science and technology practice.

1. The Current Situation of Biochemistry Curriculum and Teaching in China

Biochemistry is a subject with strong theory and practice, and its teaching needs the combination of theory and practice. At the same time, biochemistry intersects with other disciplines, involving gene engineering, metabolic engineering, gene silencing and many other aspects, and plays an important role in modern life science research, having a vital impact on the improvement of students' scientific quality^[1]. However, the existing teaching contents of biochemistry pay too much attention to the theoretical basis, but pay less attention to the practical application. The current curriculum does not well reflect the equal emphasis on the theory and application of biochemistry, resulting in the lack of enthusiasm and initiative of students^[2].

2. Reform measures of biochemistry teaching

Biochemistry is a subject with strong theory and practice, and its teaching needs the combination of theory and practice^[3]. At the same time, biochemistry intersects with other disciplines, involving gene engineering, metabolic engineering, gene silencing and many other aspects, and plays an important role in modern life science research, having a vital impact on the improvement of students'

scientific quality. However, the existing teaching contents of biochemistry pay too much attention to the theoretical basis, but pay less attention to the practical application^[4]. The current curriculum does not well reflect the equal emphasis on the theory and application of biochemistry, resulting in the lack of enthusiasm and initiative of students.

2.1 Focus on inspiring thinking

The teaching concept guides the teaching activities. Therefore, teachers should pay attention to the constant updating of the teaching concept. The traditional teaching concept is difficult to adapt to today's quality education. It is necessary to avoid serious disconnection between educational thinking and innovative practice through the deep integration of ideas and practice^[5]. It is necessary to eliminate the rough and extract the essence, eliminate the false and retain the true, enhance students' interest in learning and stimulate students' enthusiasm^[6]. Because many contents in the teaching process of "biochemistry" are too abstract for students to understand, which has caused great obstacles to teaching work. In the future, we should fundamentally change the educational concept. Teachers can integrate various flexible teaching forms into the classroom through inspiring thinking training in the teaching process, making the teaching content more intuitive and vivid, driving the classroom atmosphere and facilitating students' understanding. It can not only broaden knowledge, but also improve students' thinking ability and enthusiasm for classroom participation.

2.2 Enrich teaching forms

At present, the contradiction between the rapid development of science and technology, increasingly rich professional knowledge and traditional teaching methods has become increasingly prominent. Students should not only understand but also remember the knowledge points in the "biochemistry" course. In the teaching process of "biochemistry", students often feel that knowledge points are cumbersome. Therefore, how to enrich teaching forms and simplify the huge knowledge system has become the primary task of teachers. At present, the main teaching methods include Internet teaching and experimental teaching. Among them, multimedia teaching is the main method to realize network teaching. Through the vivid expression of images and videos, it emphasizes the key points and difficulties, stimulates students' enthusiasm for learning, and improves students' classroom concentration. Teachers can use multimedia to assist teaching^[7]. By making simple, beautiful and flexible multimedia courseware, they can transform words into vivid pictures with real three-dimensional animation effects, so that abstract knowledge can "move" and improve the vividness of the classroom.

2.3 Update experiment contents and expand experiment types

In order to solve the problem of outdated and stereotyped content in the traditional "biochemistry" experimental teaching process, teachers should pay attention to the news related to life science in TV, journals, the Internet and other platforms, understand the latest research progress in the field of "biochemistry", such as genome sequencing of a species, the pathogenesis of a newly discovered virus, the transmembrane mechanism of a newly synthesized protein, etc., reorganize the experimental teaching content, and build a professional An experimental teaching system that can exercise students' basic experimental skills and innovative thinking, and enrich the types of experiments^[8].

2.4 Establish interdisciplinary knowledge system

At present, many universities have combined biochemistry and biology. This combination of courses reflects the current trend of discipline development^[6]. However, interdisciplinary knowledge system is not a single form that can be simply applied to other disciplines^[6]. It must be well integrated into the current disciplines, so that new knowledge and research directions can be well developed. The new biochemistry curriculum must include biology, chemistry, engineering and computer science^[3]. Only in this way can students continue to work in this field in the 21st century and make important progress in the near future.

2.5 Improve teaching quality and teaching effect

Biochemistry is an applied discipline. In many universities, we may introduce many relevant knowledge and methods into the curriculum, and these knowledge and methods are very important. Biochemistry teachers should constantly improve their professional skills, make themselves capable of dealing with different types of courses and master the necessary analytical methods, and at the same time, they must understand the trend of the development of biology.

Teachers should learn the latest information about the development of biotechnology, including the latest progress in the fields of genetic engineering, molecular biology and cell biology^[9]. Teachers must have a good research background and the ability to extensively dabble in other disciplines and apply these knowledge to biochemistry teaching. Teachers must also be able to collect and transmit a large amount of data and information through effective ways. In order to enable students to learn the relevant knowledge of the curriculum and master the necessary experimental skills in the classroom, it is necessary to design the curriculum content well

and carry out teaching reform.

2.6 Improve teaching quality and teaching effect

The new curriculum standard should include all the courses, not only those involved in life science, but also the disciplines related to bioengineering^[2]. The new curriculum standards should include: (1) techniques and methods in biological research; (2) the importance of biology in modern life and society; (3) basic structure of biological system; (4) functional regulation process, regulation process in biological system and its influence on intracellular metabolic reaction and results; (5) genetic information and its application, and the application of genetic engineering technology in cell biology, molecular biology, etc^[4].

Summary

Under the background of cultivating application-oriented talents, the course of “biochemistry” needs to change the teaching concept, flexibly apply a variety of teaching methods, adjust the experimental teaching content, and optimize the assessment system to improve the students’ ability to integrate theory with practice. Only teachers with high quality and strict requirements can cultivate comprehensive talents. Therefore, teachers should constantly update their own teaching “database”, constantly explore teaching methods that can be widely accepted by students, and constantly improve their comprehensive ability to achieve the goal of high-quality teaching. Through teaching reform, students’ enthusiasm for independent learning can be improved, the limitations of traditional teaching mode can be overcome, and the teaching effect can be improved.

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