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Research on the application of STEM education concept in college education

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Abstract: In the current trend of education reform, STEM education, as a comprehensive educational concept, is gradually receiving the attention and practice of the global education community. Taking STEM as the guiding concept is the general trend of the current education development and reform. Higher education occupies an important position in the education system of our country, which is the important driving force of our modernization construction and the steady development of society. Introducing STEM concepts into university teaching not only helps to promote teaching reform, but also promotes the all-round development of students, improves their comprehensive ability, and provides talent support for the country. Nowadays, the world has gradually entered the high-speed information age, and countries are speeding up the training of high-end talents to improve their comprehensive strength and international competitiveness. Colleges and universities are also gradually exploring new teaching models in order to take the road of high-quality teaching. In view of this, based on the concept of STEM education, this paper briefly outlines the necessity of integrating STEM education into college teaching, and further puts forward specific teaching strategies on this basis to explore how to realize the reform and innovation of college education under the guidance of STEM education concept, hoping that this research can provide useful reference for relevant workers.

Key words: STEM education concept; efficient teaching; strategies

1 Introduction

Colleges and universities are important positions to train talents with high accomplishment and high quality, and classroom teaching is a necessary way to train talents. Under the new educational environment, college teachers need to innovate their teaching ideas in time and shoulder the important mission of cultivating comprehensive talents for the country. The teaching of college teachers based on the concept of STEM education is a breakthrough in the traditional teaching mode, which is conducive to enriching students' experience, deepening students' understanding of subject knowledge. At present, STEM education in the field of higher education in China is at the stage of exploration and experiment. This article has conducted research on this topic, which will contribute to the development and application of STEM education in higher education in China.

2 The importance of STEM education in college education

2.1 Cultivating advanced talents with comprehensive ability

At this stage, China has entered a new stage of development, and the country's economic development level is steadily improving, entering a new normal. At present, the industrial structure of our country needs to make further adjustment. From the talent level, the society needs more compound talents with practical ability and scientific literacy. Overall, the market demand for talents has shifted from labor-intensive talents to knowledge-intensive talents. In this context, teachers carry out education and teaching work under the concept of STEM education, which is conducive to grasping the new opportunities of the new industrial revolution and seizing the development opportunities in the field of education under the rapidly changing world situation [1].

Promoting STEM education in colleges and universities can cultivate compound talents with professional skills, scientific literacy, innovation awareness and ability, and thus enhance the international competitiveness of the country. For example, some colleges and universities are offering new disciplines such as artificial intelligence, whose purpose is to keep up with the development of the times, seize new development opportunities, change the traditional learning model, take the market as the guide, build a new talent training model, cultivate comprehensive talents that adapt to the development of society and industry, and provide high-end talent resources for the society [2].

2.2 Promoting multidisciplinary exchanges and cooperation

The core purpose of education is not only to improve the performance of students, but also to improve the overall quality of students, especially in the stage of higher education. With the deepening of education reform in our country, college education can not be confined to the single subject knowledge teaching to students. At this stage, some universities have first tried to create new media laboratories by integrating arts, sciences, media and other comprehensive disciplines, so as to ensure that students can have access to a more comprehensive knowledge system and produce emerging scientific research results. The STEM education concept is gradually guided into higher education, which provides a channel for integration and communication between various disciplines.

3 Teaching strategy for the application of STEM education concepts in college education

3.1 Adjusting teaching steps and improving teaching quality

In the traditional teaching mode, there has always been a fixed process, that is, the classroom first reviews the knowledge learned in the previous lesson, the teacher introduces the content of the lesson, teaches new knowledge, and students carry out consolidation exercises, completing homework. In the whole teaching framework, the main line of task is the teacher's teaching, not the student's learning [3]. Teachers occupy the dominant position, and students assume the role of passive input of knowledge. STEM education concept is exactly the opposite of the traditional education concept, which transforms the main task of knowledge imparting and learning into the main task of solving problems. In STEM teaching, students can present research results. According to students' academic performance, teachers can make teaching adjustments so that students can further internalize and absorb what they have learned. Classroom teaching innovation guided by STEM education concepts can more prominently highlight the subject status of students.

Under the concept of STEM teaching, the classroom teaching of college teachers needs to break through the shackles of traditional teaching mode and create new teaching design. Specifically, teachers can organize students to explore and solve problems by means of group cooperation and project teaching, so as to promote communication and cooperation among students. The above teaching approaches can not only promote the innovation of teachers' teaching mode, but also encourage students to have more innovative awareness and ability under the influence of STEM education concepts [4].

3.2 Implementing interdisciplinary project-based learning to enhance students' comprehensive ability

The core of STEM education philosophy lies in project-based learning for students. Therefore, in college education and teaching practice, teachers should pay attention to organizing diversified project learning methods, guide students to

carry out STEM exploration activities, encourage students to solve some conceptual and strategic problems in a single discipline in the project exploration, and promote the development of students' potential skills. Taking the teaching of mechanical drawing in mechanical engineering as an example, teachers can design the drawing project of "gear reducer drawing" and guide students to complete the task in the way of group cooperation. By drawing the gear reducer diagram, students can not only realize the flexible use of theoretical knowledge and conceptual knowledge, but also reflect their own project creativity with a variety of modern technical means.

3.3 Achieving the localization of STEM education with teaching speciality

The integration of STEM education concepts into university teaching should adhere to the principle of down-to-earth and gradual progress, rather than blindly pursuing speed. On the one hand, the application of STEM education concepts should not emphasize the boundaries too much. At present, the popular comprehensive talent training concepts, such as project-based learning, comprehensive practice courses, thematic courses, STEM education, etc., are closely related. In the process of teaching, teachers should blur the boundaries between different educational concepts to avoid the pressure of new educational concepts. On the other hand, science and technology is one of the elements of STEM education concept, but in the process of applying the education concept, science and technology should not be overly emphasized, while its comprehensiveness should also be focused. For college students, although most of them have been exposed to relevant scientific knowledge in the basic education stage, the specific learning style may be different. Therefore, to integrate STEM education concepts into college teaching, teachers need to give full play to their subjectivity, guide students from the subject itself, and actively explore how to integrate other knowledge and skills into teaching, so as to help students understand subject knowledge more comprehensively and deeply, and realize the malleability of subject knowledge. In addition, in the process of applying the concept of STEM education, multi-disciplines should not be overemphasized.

3.4 Building special teaching model based on the characteristics of STEM education

In order to better train comprehensive and complex talents, the application of STEM in Chinese higher education must emphasize its practicality and regression. On the one hand, the practicality of STEM education concept requires colleges and universities to pay attention to the development of students' innovative ability and problem-solving ability in the process of talent training, the core of which is to enable students to obtain rich practical activity experience based on curriculum activities. Therefore, in the course of subject teaching, teachers can design relevant curriculum activities around subject contents with the help of various teaching hardware. On this basis, teachers can also design practical curriculum activities to improve the interaction of curriculum teaching, and encourage students to broaden their horizons, acquire knowledge and inspire in the exchange. On the other hand, the regression of STEM education concept emphasizes the importance of learning interest in STEM learning.

4 Conclusion

All in all, STEM education concept is a teaching concept that emphasizes the organic integration of disciplines and attaches importance to cultivating students' innovative consciousness and practical ability, and its advanced nature is in line with the development needs of the times. College education should keep pace with the times and conform to the trend. It should adopt measures from multiple aspects, such as adjusting classroom structure, carrying out interdisciplinary project learning, promoting localization of STEM education, and creating characteristic teaching models based on the characteristics of STEM education, so as to innovate the teaching concepts and models of colleges and universities and improve the quality of education.

Conflicts of interest

The author declares no conflicts of interest regarding the publication of this paper.

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