

The Enlightenment of Steam Education Mode to the Culture Course of Secondary Vocational Education

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Abstract

The STEAM education model is a comprehensive education that trains students based on project-based learning and interdisciplinary integration. This paper analyzes the characteristics of STEAM education model, and analyzes the problems existing in the teaching of Chinese vocational culture at the present stage, and seeks breakthroughs from the STEAM education model, from the perspectives of progression and employment, project-based learning, inter-disciplinary integration and developmental assessment. Explore the teaching of secondary vocational culture.

Keywords

STEAM education model; culture class; project-based learning; interdisciplinary integration.

1. Introduction

With the gradual warming up of “education for education” and “education for sustainable development”, schools at all levels recognize that there are some drawbacks in the teaching of sub-disciplines in traditional education, and hope that from “test-oriented education” and “quality education” Seeking new breakthroughs in the barriers. The rise of STEAM teaching and the rapid acceptance of China's entry into China are not unexpected. This is a milestone in breaking through the teaching of divisions to the integration of teaching across disciplines.

In 2014, the "Decision of the State Council on Accelerating the Development of Modern Vocational Education" clearly stated that "based on ensuring the quality of students' technical skills training, strengthening cultural basic education and realizing the ability to obtain employment and have a foundation for further studies [1]. Strengthening Cultural Basic Education It is necessary to strengthen the understanding of the status quo of cultural basic education, clarify the problems existing in it, and propose measures to strengthen. The basic culture course of secondary vocational colleges is an indispensable part of the curriculum system. However, for a long time, there are many problems in the teaching of basic culture courses, such as unreasonable curriculum, lack of flexibility in teaching methods, and failure of effective cultural and professional courses. Cohesion, etc., coupled with the fact that the actual education level of the secondary vocational freshmen is relatively low and the degree of dispersion is large, makes the teaching results of the secondary vocational culture class unsatisfactory.

This paper analyzes the characteristics of STEAM education mode and the problems of the secondary vocational education culture class, and explores the cultural courses of secondary vocational colleges from the aspects of progression and employment, project-based learning, integration of cultural and professional courses, and developmental evaluation. Teaching mode, and said that strengthening the training of teachers is an important guarantee to realize the introduction of STEAM education mode in the vocational education class. It is to provide

enlightenment for improving the quality of running schools and improving students' comprehensive quality.

2. The "STEAM" Education Model Features

"STEAM Education" refers to the fusion of science, technology, engineering, arts, and mathematics. It comes from the new concept of American comprehensive education, that is, to cultivate Comprehensive talents, comprehensive education in science, technology, engineering and mathematics regardless of subject. In other words, STEAM is an interdisciplinary education. The interdisciplinary purpose is mainly to achieve integrated research on problems by transcending the previous research methods. The STEAM education model advocates "moving the brain" and "doing high school", emphasizing the importance of both knowledge and ability, emphasizing the cultivation of creativity and innovative thinking, and aiming at cultivating people with all-round development through interdisciplinary integration of teaching.

2.1. Emphasis on the Integration of Disciplines

Throughout the history of Chinese education and even the history of education in the world, it has been controversial about whether to use sub-disciplinary teaching or integrated teaching in teaching. The STEAM teaching mentioned in this article is the representative of the integrated curriculum and integrated teaching. STEAM emphasizes the integration of knowledge and skills. It has two meanings. One is original and special multidisciplinary knowledge and skills, and the other is interdisciplinary knowledge and skills. Specific multidisciplinary and interdisciplinary integrations are differentiated and can be distinguished by using Salad and Smoothie. Salad's approach is to dice the fruit into platters without destroying the characteristics of each fruit. This is similar to the specific multidisciplinary model. Multidisciplinary is to achieve specific goals. Each subject retains various subjects in the curriculum design and teaching. The characteristics and main content of the study, select the appropriate teaching content to carry out teaching activities. In the production of Smoothie, it is necessary to break all the ingredients into a glass of juice, and the interdisciplinary integration in the course organization and practical teaching is to integrate the knowledge of each subject and work together for the teaching goal. Interdisciplinary integration emphasizes the intersection, convergence and integration of disciplines, which is more challenging for educators.

2.2. Emphasis on the Cultivation of Comprehensive Ability

The STEAM teaching philosophy is closely related to the quality education advocated in China at present. Quality education emphasizes the cultivation of creativity, critical thinking and self-learning ability, and cultivates people who are fully developed in all aspects. This coincides with the "21st Century Skills" proposed by the United States, the essence of the "21st Century Skills" advocate is learning and creativity, see the picture below. These abilities or skills cannot be learned in a single way and must be cultivated through interdisciplinary, multi-channel, and cross-platform teaching methods.

STEAM conducts teaching based on project-based learning. Project-based learning aims at one or more thematic areas, introducing real-life scenarios and techniques into the curriculum. When designing the curriculum, it starts with questions, current situation surveys, existing experiences, final goals, and teaching results. . In this complete process, educated people can get a comprehensive and comprehensive education.

3. The Problems in the Secondary Vocational Culture Class

3.1. Unreasonable Curriculum

The 21st century is a century of rapid technological development. The knowledge and skills required by society are rapidly being updated. The ability to create creativity and critical

thinking is becoming more and more important. In this era, the purpose of cultivating talents in secondary vocational schools should not be limited to acquiring skills, but should focus on the cultivation of students' comprehensive abilities. At present, there are many problems in the curriculum of cultural courses in China's secondary vocational colleges. Taking a secondary vocational e-commerce major in Tianjin as an example, the first semester of the first-grade cultural course (language, number, foreign, computer) accounted for 70% of the total curriculum, and the proportion of the first-grade semester cultural lesson was reduced to less than 30%. It is unreasonable to make the arrangement of the lectures. In the specific content of the lecture, the cultural course of the major has not moved closer to the e-commerce profession. The teaching method is also a traditional teaching mode, which does not reflect the characteristics of the secondary vocational school. After graduating from secondary vocational students, some of the students were directly employed, and they were not able to contact employment in the curriculum.

Vygotsky's "recent development zone" theory emphasizes that education should go ahead of development, and the difficulty of teaching materials directly affects the quality of education. In the survey, it was found that the textbooks of the basic culture courses of the secondary vocational schools were mostly inherited from the old high school textbooks. Among them, a certain vocational English in Tianjin adopted the "PETS-1" textbook, and the new words were mostly the four-level difficulty vocabulary of the college English. The difficulty was relative to the secondary vocational students. It is said that it is difficult, and there is a gap with the existing knowledge and experience. Students can't get satisfaction in the study of culture class, and can't arouse the interest of students. It will lead to a decrease in self-efficacy, affect the quality of teaching in culture classes, and even the whole. The study at the secondary level has a negative impact.

3.2. Teaching Method Is Not Flexible

The biggest difference between the secondary vocational school and the ordinary high school is that the secondary vocational students have their own majors as soon as they enter the school. The same school has e-commerce majors, and also has the design and installation of organic electricity. The professional classification of the same school is very high. The focus of the lesson will vary. However, the specific teaching of the cultural courses of secondary vocational colleges is not closely related to the students' professional, and the teaching methods are also taught according to the unified teaching materials, which cannot be handled flexibly according to the professionalism of the students. The survey found that the school has no distinction between the e-commerce major and the electromechanical design, installation and maintenance majors in the teaching objectives of the three major courses of language, mathematics and English. Taking the mechanical and electrical design according to the installation and maintenance profession as an example, the profession is a very practical profession, and at the same time has higher requirements for students' mathematical ability. The secondary vocational school has no difficulty in distinguishing the professional setting from other professions. Math class and comprehensive math class related to his major. Because the secondary vocational students have a low degree of education before entering the school and have a large degree of dispersion, they are taught according to the uniform teaching progress. It is prone to fail to keep up with the backward students or the students' low interest and affect the teaching quality.

3.3. Cultural and Professional Courses Are Not Effectively Connected

Through the investigation of many secondary positions in Tianjin, the textbooks used in the culture class are the national education new textbooks for the reform of the secondary vocational education curriculum of the PEP or the Jiangsu education edition. The series of textbooks were found to be studied. The content of the textbooks is mostly ordinary high school. The follow-up of the old textbooks has made some adjustments in the teaching progress and

teaching difficulty. There is no distinction between the teaching content and the student's profession. The professional course is that each school chooses its own teaching content according to its own profession. In the investigation of a secondary vocational school in Tianjin, the school department was divided into the higher vocational department, the basic department, and the sports department. Among them, the basic department is responsible for the teaching and research of language, mathematics, English, music and other disciplines. The higher vocational department has opened 8 majors such as accounting, marketing, logistics management, heating ventilation and air-conditioning technology, computer network technology, etc. There is little intersection in the work, and teaching and research and preparation are also carried out independently. This leads to the failure of the school to develop a talent training program. The cultural and professional courses are not effectively connected. The content of the culture course lacks practicality and does not help students to learn professional courses. And career development.

4. Based on the STEAM Education Model, the Reform of the Secondary Vocational Culture Curriculum

Since the introduction of China into the STEAM education model, it has developed rapidly in K12 education and played an active role in improving students' creativity and creativity. The successful development of STEAM in basic education provides reference for the reform and innovation of vocational education. Since the publication of Howard Gardner's theory of multiple intelligences in 1983, the most important point affecting the education industry is that it is not in a single way, but the ability of students. The theory of multiple intelligences allows educators to understand and seek professionalism. If the educational content is too singular, it will not be conducive to stimulating students' potential. Therefore, promoting the integration of disciplines and creating opportunities for the integration of various subjects has become an active goal of the STEAM education model.

4.1. Cultural Lessons in Real Situations - Taking Care of the Students and Employment

In addition to improving the cultural quality of workers, secondary vocational education also undertakes the function of transporting qualified intermediate-level skilled workers and laborers for the labor market, providing lifelong services for further further development and career development of technical and technical personnel. In order to achieve this goal, in the teaching, we must implement the policy of "employment has the ability to go to school and have a foundation". In the actual teaching, teachers of basic culture should address the teaching requirements and teaching methods for the dual requirements of "employment" and "advancement". Adjustment. How to balance "employment" and "advancement" in the cultural class, the traditional sub-curricular courses cannot be satisfied, and the STEAM education model with comprehensive curriculum and integrated teaching can combine the dual goals of progression and employment.

STEAM Education is committed to building a diverse and open learning environment for students, attaching importance to the relationship between students and the real world, and paying attention to the experience of students in the learning process. Under this educational model, the secondary vocational culture class adopts this real situation. Inquiring education can stimulate students' learning motivation and let students understand industry information as soon as possible. The former can improve the teaching effect, while the latter prepares for employment and achieves both preparation for further studies and employment.

4.2. Conduct Project-Based Learning – Achieving Effective Interdisciplinary Integration

Improving the effectiveness of the teaching of secondary vocational culture is a long-term concern for frontline teachers and educational researchers. In order to achieve teaching results, we must first have a well-defined goal and a meaningful and meaningful teaching process, and implement a “learner-centered” educational philosophy. In actual teaching, we can flexibly change the teaching method according to individual differences of students. In order to help students acquire knowledge and form a benign learning experience.

STEAM Education uses specific projects or issues as the center of teaching, and sets teaching objectives around specific teaching tasks, and based on this, achieves effective interdisciplinary integration. For example, in the language class of the e-commerce class, the teaching activities of “how to write attractive copywriting” are carried out to write “attractive copywriting” as the teaching goal, and the marketing activities of the shopping website are used as carriers, guided by teachers, and students are independent. Created an event and ended up with a creative copy. The whole teaching activity combines the Chinese composition class with the students' actual professional skills, allowing students to design their own marketing activities, which can mobilize the students' enthusiasm, give full play to the students' subjective initiative and improve the teaching effectiveness. It should be noted that the integration curriculum should focus on the diversity of the classroom, introduce the theme in many aspects, and use different teaching activities to enhance the students' understanding; the integrated curriculum should be hierarchical in the teaching strategy, and the difficulty should be from shallow to deep, step by step; integration In the course of teaching design, we should pay attention to the logic between professional courses and cultural courses, choose appropriate connection points, and interlock with each other to teach.

4.3. Clear Direction, Seek Truth From Facts - Strengthen the Integration of Cultural and Professional Courses

Compared with ordinary high schools, secondary vocational schools can be said to be directed training. Teaching focuses on cultivating students' corresponding professional abilities. It also depends on the mastery of professional skills, the practicality of the knowledge learned in future work, and the counterparts facing students who want to go to school. It is not difficult to take the individual subjects for individual entrance examinations or adult college entrance examinations. The competition for such examinations is not intense. This requires cultural teachers to adhere to the professional courses in the middle school. The classroom orientation is to clear the direction and seek truth from facts. Tilt to the professional class. Change the situation of the teachers of the culture class and the teachers of the professional skills class. The teachers of the culture class integrate the culture class and the professional course in the course design, and establish a course with the knowledge of the culture class and the professional skills as the supplement, and strengthen the process of knowledge acquisition. The commonality, in turn, gradually penetrates the knowledge required by the students' majors in the teaching of cultural classes, helping students to construct a comprehensive view of knowledge. The professional teachers should also attach great importance to the promotion of the teaching of professional courses in the teaching of professional courses, and actively cooperate with the teachers of cultural courses to help the teachers of cultural courses to determine the teaching content, teaching objectives and teaching plans around the requirements of “improving humanities and professional teaching” [2].

4.4. Emphasis on Developmental Assessment - Stimulating Students' Enthusiasm for Learning

In general, students' learning evaluation can be divided into formal assessment and summative assessment [3]. The application of developmental assessment is gradually accepted in the

evaluation of education. Teachers should carefully observe the changes of students at each stage, convert static evaluation into dynamic evaluation, and abandon the evaluation method that only pays attention to results and only pays attention to results. Another advantage of developmental assessment is that it breaks through a single assessment to determine student learning outcomes and is being accepted in STEAM education.

Emphasis on the acceptance of the content of the lectures by the students. The knowledge base of the cultural courses before the entry of the secondary vocational students is limited. It is difficult to control the connection between the cultural courses and the professional courses. If the classroom acceptance is not monitored in real time, it is easy to cause classroom failure. The so-called "qualitative feedback" is to understand how much the students have absorbed the knowledge of the professor, whether they can be internalized into their own existing experience, and whether they can use the learned knowledge for practical application. Teachers should focus on understanding the students' demands and individual differences, adjust the classroom difficulty and teaching progress in a timely manner, and ensure the acceptance of each class.

For the teaching evaluation of secondary vocational students, it is not necessary to perform after the end of the course. Teachers can regard the teaching evaluation as a normal inspection to observe the learning process of each student and the changes in emotions and values. Students realize that they are cared for and valued. Because the secondary vocational students are about to enter the special orientation of the society, teachers should evaluate the learning process, and comprehensively evaluate their teamwork ability and manual brain ability. According to the individual differences of each classmate, different evaluation criteria are adopted. Give students appropriate evaluations, so that every student can get a realistic evaluation, and then stimulate students' enthusiasm and creativity in learning, improve classroom quality and promote students to grow better.

5. Summary

At present, the interdisciplinary research in China is not reduced, and the STEAM education model is also in full swing in K12 education. However, the STEAM education model is "imported goods" after all. In order to smoothly promote its development in vocational education, researchers need to face China. The predicament of the current vocational education and the clarification of the connotation of the STEAM education model, the intersection of the STEAM education model and vocational education, must not be painted on the cat, only to do the surface. The fundamental guarantee for the quality of the secondary vocational culture under the STEAM education model is to strengthen the training of teachers. One of the characteristics of the STEAM education model is the emphasis on the integration of disciplines, which requires teachers to be involved in multidisciplinary knowledge when teaching. In traditional teacher training, the division of disciplines is too specific. In the few years of studying for a degree, teachers only systematically and comprehensively study the majors they have studied, but little is known about other professions. There is very little intersection between mathematics teachers and undergraduate education of physics and chemistry teachers, not to mention exchanges in the fields of machinery manufacturing, financial commerce, medical and health care. Therefore, teacher training is the top priority of STEAM teaching mode.

On May 8th, 2018, the STEM Education Research Center of the China Academy of Science and Education released the "STEM Teacher Competency Rating Standard (Trial)". The secondary school can refer to this "Standard" to train cultural teachers, from the perspective of educational value understanding, disciplines Comprehensive, systematic training of teachers at the level of integration, teaching ability and professional development. The school can organize cultural class teachers and skills, professional class teachers to participate in teaching and research, using the form of "from simple to complex" to let teachers understand the knowledge

of other professions. Due to the large span of various professions, such as business management and mechanical and electrical design installation and maintenance, it is unrealistic for cultural teachers to understand all the professional courses. A professional-led teaching and research team can be formed within the school. Professional teachers and cultural teachers form a related group. The content and method of teaching the curriculum for the related majors.

Only student-oriented and practical, can effectively promote the integration of STEAM education model and vocational education, and promote the vigorous development of vocational education.

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