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Teaching reform and development of mechanical major in secondary vocational schools based on "Internet +" and big data

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Abstract. In the rapid development of Internet technology, the development mode of "Internet + education" has gradually entered the field of vocational education, and new information education technologies continue to emerge. According to the practical investigation and research, while getting rid of the traditional teaching mode, the mechanical major teaching in secondary vocational schools has mastered more technical theories through various types of educational practice activities, and has now formed an education system with "Internet +" as the theme. In this paper, on the basis of understanding the current situation of education reform of mechanical major in secondary vocational schools in the new era, according to the development mode and main content of "Internet + education", in-depth discussion on teaching reform measures of mechanical major in secondary vocational schools based on "Internet +" and big data, in order to provide outstanding talents for economic construction and development in the new era.

Keywords: "Internet Plus"; Big data; Secondary vocational education; Mechanical; Professional teaching.

1. Introducion

Secondary vocational education is the basic component of modern education. The construction and promotion of diversified practical training courses can improve students' practical ability and professional quality. It is one of the core courses essential to modern vocational education and runs through the whole education process, and occupies an important proportion in the training plan of various disciplines. How to integrate the "Internet + education" mode into the practical training courses of secondary vocational education, and how to penetrate the new theory and new technology into the vocational education services, is the main topic of the reform of secondary vocational education in the new era. Taking mechanical Basic comprehensive practical training course as an example, this professional course is a compulsory practical training course for mechanical major teaching. Similar to other practical training courses, it is usually arranged centrally within one to three weeks. In the educational guidance, the completion of the design task is regarded as the main goal, and the overall process is designed according to the theoretical teaching and practical requirements. Ensure that students can integrate their knowledge and applied skills in their participation.[1-3]

Nowadays, most of the practical training courses of mechanical majors in secondary vocational schools continue the traditional teaching mode integrating "teaching and training". Although this mode achieves the goal of integrating science and practice, the overall teaching arrangement is very reasonable, but the time allocation of each stage is not scientific, among which the education link only occupies a small part, and more training is the normal practice teaching. From the perspective of knowledge and skill application, the theoretical knowledge and skill information transmitted during education are very crucial. The theoretical knowledge contained in the practical training is relatively concentrated, and some knowledge points are relatively comprehensive. However, at present, most students have imperfect theoretical knowledge and practical skills, weak self-learning awareness and innovation ability, and have not formed good learning habits. As a result, the teaching and learning links in practical teaching cannot reach the expected effect, and the final

training link cannot achieve the final goal. At the same time, in the process of practical operation, there are great differences in each student's understanding ability and practical ability, and the demonstration time of students is short. As a result, after the completion of the demonstration, some students who are slow in accepting and understanding ability do not fully grasp the operation points of this class, and finally cannot guarantee the teaching quality of practical training.[4-7]

In the process of social economy and technological innovation and development, facing the increasing requirements of talent training, the teaching of mechanical major in secondary vocational schools should deeply explore the effective measures of practical courses based on "Internet +" and big data on the basis of clarifying the advantages and disadvantages of traditional teaching and aiming at the goal of talent training in the new era. As the "Internet +" education theory provides new ideas and methods for the innovation of secondary vocational education in the new era, mobile Internet technology, online open course, online course, micro-course and other emerging in the market have changed the traditional education model and people's learning habits, so this paper on the basis of understanding the concept of "Internet +" and big data technology, According to the accumulated teaching experience of mechanical major in secondary vocational schools in the new era, the main characteristics of the current practical training courses of mechanical major are clarified, and then the in-depth discussion is made on how to fully penetrate the "Internet +" and big data related content in practical education, so as to lay the foundation for improving the teaching quality of secondary vocational education.

2. Method

2.1 Online teaching platform

This design is based on the concept of "Internet + education". Practical teaching activities of mechanical majors in secondary vocational schools will not be restricted, and all teaching resources can be directly uploaded to the Internet and presented to students in the classroom and within a fixed time. For the teaching work of mechanical majors in modern secondary vocational schools, the online teaching platform is representative. The specific structure is shown in Figure 1 below. The common types in the market at present can be divided into the following types:[8-11]

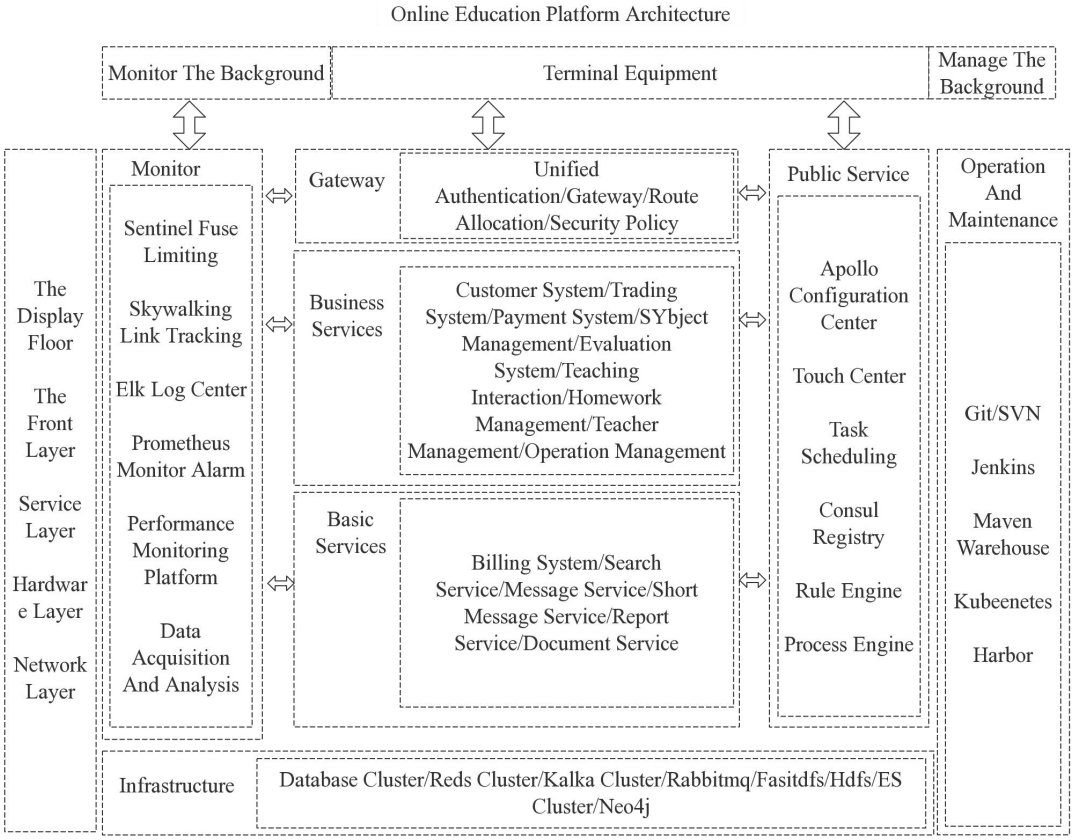

Figure 1. Structure diagram of online teaching platform

The overall platform architecture design includes the display layer, the front-end layer, the service layer, the hardware layer, the network end. The infrastructure includes the software technology of the overall system architecture, and all the collected data information will be stored in the database cluster. The monitoring area includes circuit breaker current limiting, link tracking, log center, monitoring alarm, performance monitoring platform, data acquisition and analysis; Public services include configuration center, touch center, task scheduling, registry, rule engine, traffic engine and so on.

Combined with the overall platform architecture design can be designed into three types: first, online course platform class. This platform is mainly responsible for the management of online education resources, classroom teaching content discussion, student homework submission, examination and testing and other functions; Second, live online education platforms and instant messaging platforms. This kind of platform has the function of live broadcast of online courses, which can facilitate real-time interaction between teachers and students, real-time explanation and effective demonstration in online courses, and has the basic function of teaching effect feedback. Finally, comprehensive platform. The design of this kind of platform mainly includes the basic functions of online courses and course live broadcasting. With the continuous improvement of technical functions, there is no unified standard for the selection of this kind of platform, but to meet the use habits of teachers and students.[12-15]

2.2 Online resource construction

In the innovation and development of "Internet + education", the construction of online resources is the core content. A high-quality online course cannot be separated from excellent and abundant online resources. Combined with the structure diagram of online resources shown in Figure 2 below, it can be seen that online education resources mainly utilize network technology and communication technology to optimize the communication mode between teachers and students. Compared with the traditional face-to-face education mode, online education resources are not

limited by time, region and other conditions, and can be flexibly used in classroom education and guidance.

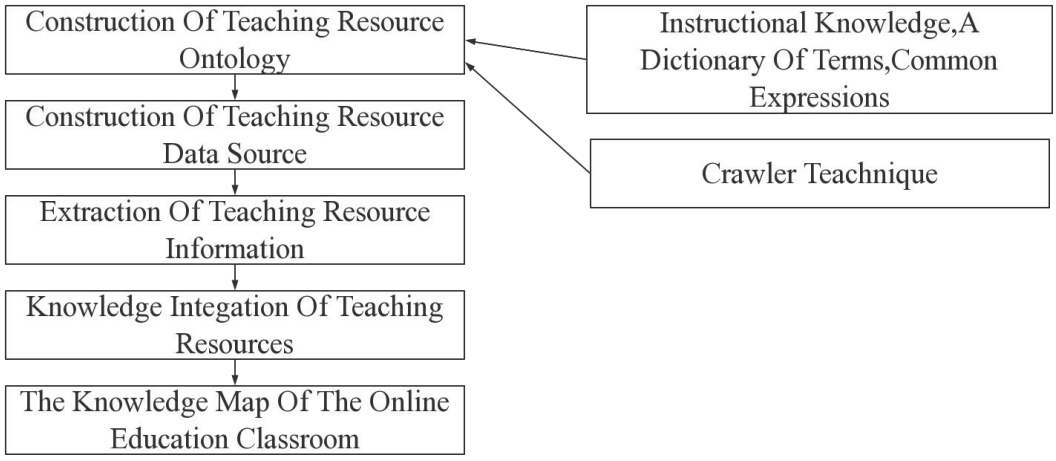

Figure 2. Online resource structure diagram

Before choosing online education methods, teachers should use science and technology to build knowledge graph, which belongs to different graphs showing the development process and structural relationship of knowledge, can show knowledge resources and application carriers according to visualization technology, and deeply dig and show the mutual relationship between knowledge. In this process, the knowledge graph will represent entities as nodes, and the attributes of entities and their relationships can form a network graph structure, as shown in Figure 3 below:

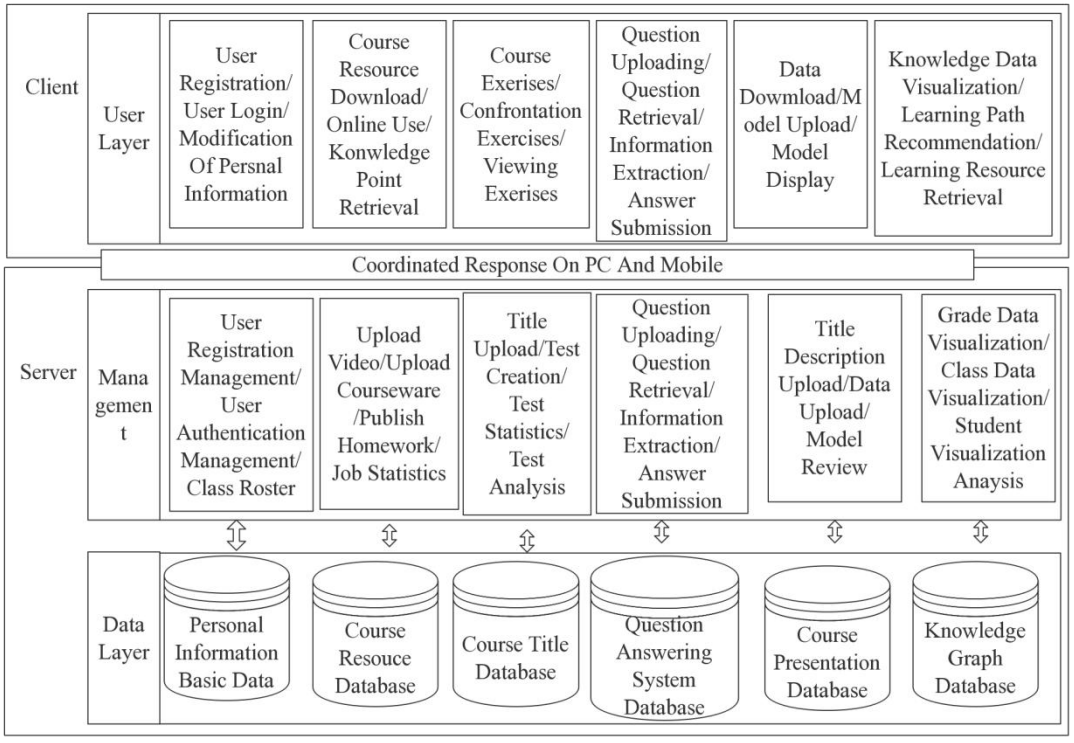

Figure 3. Structure diagram of education platform based on knowledge graph

Based on the above analysis, we can see that this structured form of knowledge graph is convenient for both human recognition and machine understanding. The construction of online resources includes course information, educational materials, teaching plans, practice exams and other contents. The overall platform is mainly divided into three parts: the first is the index data layer, which is mainly used to store users' personal basic information, the database of course resources, course questions, question and answer system, etc. The second is the server, mainly used

to manage the data layer provided by the database, such as user registration management, video upload and download, topic retrieval and information extraction; Finally, it refers to the user layer, which should be applied according to the provided database and management module, such as user login registration, course online use and knowledge retrieval, course practice, data download and model upload, knowledge data visualization processing, etc.

3. Result analysis

In the innovation and development of Internet + and big data technology, mechanical education in secondary vocational schools has put forward an education system that is completely opposite to the traditional teaching mode, making full use of advanced technologies with big data, artificial intelligence, cloud architecture and knowledge graph as the core, and dividing the online integrated practice teaching process into three stages:

First of all, students learn independently. Before the formal class, students should complete the teaching tasks of the course independently according to the structure shown in Figure 4. The pre-class knowledge acquisition stage directly affects the subsequent knowledge internalization stage and summary and deepening stage, so it is the focus of the development and design of the online education course, as well as the main issue of educational technology innovation in the new era. In the traditional teaching mode, students' interest in learning is not high, and they do not master self-learning methods. Therefore, in the new teaching mode, teachers will upload relevant teaching materials with the help of advanced technology platforms, and push students' self-learning tasks directly to the platform users, so that students can flexibly use the web page or mobile client of online teaching platform, while watching relevant teaching materials, Complete the clock record, submit the homework independently, and obtain the corresponding grades. Teachers can directly observe the learning status of students in the platform, and then timely adjust the important and difficult points of after-class teaching, and finally improve the efficiency of classroom teaching. In this process, students can obtain required services from data analysis, resource aggregation, management services, teaching support and other modules to complete the independent learning tasks set by teachers faster.

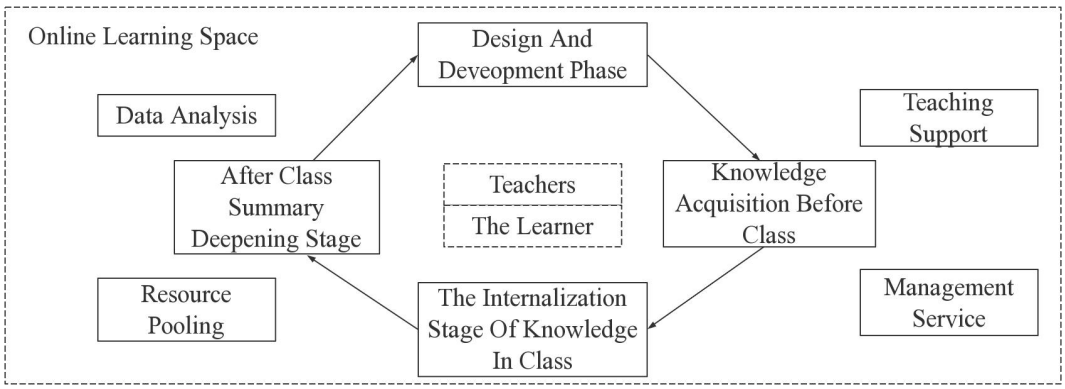

Figure 4. Structure of online autonomous learning

Second, increase interactive guidance. Traditional secondary vocational teaching of mechanical work is relatively simple, especially in the learning of theoretical knowledge, usually teachers will directly indoctrinate students. With the innovation and development of Internet education technology, there are abundant ways for teachers and students to interact with each other. Online real-time teaching software and platform can be used for guidance, and multiple links such as filling in forms, voting and answering quickly can be added during the education period, which can not only arouse students' interest in learning, but also increase the interaction between teachers and students. At the same time, teachers can use the online learning platform to raise questions and ask students to answer them during the independent learning period. At the same time, teachers can

urge students to complete teaching tasks with good quality and quantity and timely correct mistakes in learning practice.

Finally, after class assessment summary. After finishing the course teaching, teachers can organize students' online tests and summary analysis according to the process shown in Figure 5 below, check students' learning results regularly, and make statistics on students' learning completion and punching through the background of the platform, so as to facilitate the adjustment of follow-up education guidance countermeasures. At the same time, teachers should make a statistical analysis of students' speech interaction in each class, and put forward a three-dimensional evaluation plan based on the students' own situation in the class, so as to provide effective basis for the subsequent curriculum education reform.

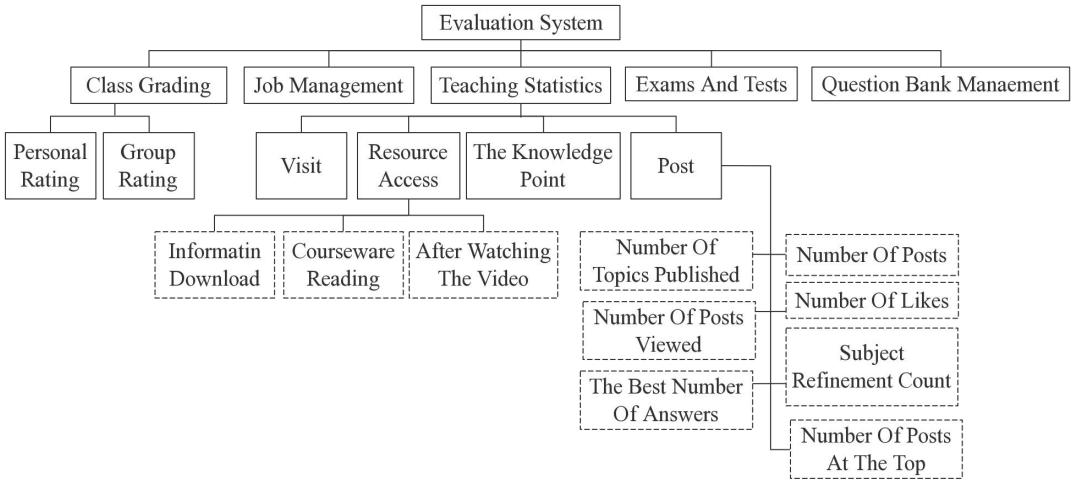

Figure 5. Flow chart of assessment summary after class

Conclusion

To sum up, in the rapid development of Internet platform and big data, Internet + education has become the main content of modern education innovation discussion. Under this background, the practical training courses of mechanical majors in secondary vocational schools have gradually changed the traditional mode. Professional teachers will make reasonable use of the online course education platform, build and promote complete courses and online education resources, and make good preparation before class, guidance during class and summary after class in the process of educational guidance, so as to solve the problems faced by the teaching of traditional mechanical majors and fully mobilize students' interest in learning. Improve the classroom instruction effect. Because secondary vocational mechanical education plays an important role in the development of vocational education, schools around the country have put forward a number of research topics according to the theoretical knowledge and practical characteristics of professional teaching while mastering the advantages of Internet information technology, in order to provide more outstanding talents for the development of machinery industry in the new era.

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