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Teaching Reform based on Modularity-Hybrid and Taking the Course Industrial Configuration Control Technology as an Example

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Abstract: Taking industrial configuration control technology for the extension course of intelligent control major in higher vocational colleges as an example, this paper expounds the teaching status, perplexments and pain points of the extension course of intelligent control major. Combining the characteristics of positions and disciplines, it determines the multi-dimensional training objectives guided by the needs of industry and students' development needs, forms the modular teaching content for enterprises and reality, and relies on the modular content for online and offline mixed teaching Learning to explore and practice. The implementation of learning assessment of the trinity of teaching methods. The results show that after the implementation of the teaching reform, the self-completion rate of homework increased by 20%, the classroom activity increased by 20%, and the students' final exam results increased by 10%.

Keywords: Vocational College; Modularity; Hybrid Type; Teaching Reform.

1. Teaching Status of Basic Courses of "Industrial Configuration Control Technology"

Industrial configuration control technology focus on and application. Configuration is the human-machine interface products. Touch screen technology is one of the important driving forces of national economic development. There are many applications in the industry. Up to now, the teaching of this course still stays in theory. Students simulate the artificial interactive interface on the computer, making this software like a low-end multimedia projection program. In the course of teaching, teachers can also feel that the course content is not sufficient and the course structure is not too rigorous. This is not enough as a professional extension course[1].

From the perspective of improving quality, improving quality, and cultivating high-quality and skilled talents. In this paper designs an innovative talent training model based on project teaching as the carrier and ability based on the pilot reform of intelligent control professional education and teaching. Expounds the specific implementation process from the perspective of practice, and demonstrates the reform and quality improvement of the three education by example.

2. Lack of Mastery of Teaching Content

The teaching content starts with software installation, and then each chapter is closed. The first chapter of the textbook teaches students how to make labels and buttons on the touch screen. The second chapter teaches students how to make animations of color ball movement on a 600*480 pixel screen. The third chapter teaches students how to make a water level monitoring system. The fourth chapter teaches students to make a manipulator control system. From the first four chapters, it is not difficult to find that the teaching method can only be offline teaching. It is difficult to integrate the online teaching part into the teaching. This mode is the traditional mode, which is dominated by textbooks and isolated courses. This mode is closed and limited, resulting in lagging teaching content. Lack of knowledge in specialized courses[2]. Detachment from the actual needs of the job. The goal of multidimensional knowledge and competence cannot be achieved. At the same time, with the rapid development of the Internet and information technology. The teaching content needs to be constantly updated and improved to meet the forefront of industry development and ensure the comprehensiveness and advanced nature of knowledge and ability.

3. Single Solidification of Teaching Mode

After receiving the knowledge, students participate in the examination uniformly, which is not suitable for the course of industrial configuration control technology. However, how to use information technology to create an information-based teaching environment[3]. Promoting the reform of teaching concepts, teaching modes and teaching contents. Promoting the in-depth and extensive application of information technology in daily teaching are exactly the issues that need to be considered. Rather than simply using information technology as another way to educate students.

Teacher-led, teaching material as the basis, classroom as the scene, too much emphasis on the pillars of teaching materials, while the classroom as the only teaching place is difficult to achieve personalized. Multi-dimensional teaching objectives[4]. In the reform of teaching mode relying on information technology, most teaching classrooms are copied and paper-based teaching resources are electronic. The interactive teaching process of adding several electronic devices in the teaching process is still like a personal concert. "Review of old lessons introduction of courses content explanation highlighting of important and difficult points after-school practice teaching summary" runs through the classroom. Information elements are mere forms and cursory, and the depth of thinking about "Internet education" is not enough to achieve the deep integration and development of teaching and information technology. Students are mostly in

a passive state in class, and the classroom atmosphere is dull and monotonous. The teacher's questions to the students on the platform are also in the final struggle, hoping that the students can learn a little more. It is difficult to achieve "improving students' information literacy, innovation awareness and innovation ability", and can not play the supporting and leading role of information technology in cultivating high-quality talents in the future.

4. Lack of Practical Operation Teaching

Vocational education is employment-oriented," docking scientific and technological development and market demand ", and aims to cultivate "high-quality workers and technical talents". Practical links play an important role in the process of personnel training. Based on job requirements and skills, the practical and operational links in the teaching process are reasonably designed according to the requirements of talents' ability and accomplishment, and the industry development is linked with the job requirements. In the teaching process, the proportion of theoretical teaching hours is too high, the implementation and operation of theoretical teaching is relatively simple, which is favored by many teachers, and the practice is easy to be ignored by teachers. Compared with undergraduate students, vocational college students are less rigorous in thinking, weak in theoretical knowledge learning ability and active research consciousness, so it is obviously inappropriate to rely on the traditional classroom mode. "Cultivating and inheriting the craftsman spirit" must be based on the integration of theory and practice, integrating theory and practice, and "guiding students to develop the quality of rigorous focus, dedication and professionalism, excellence and pursuit of excellence".

5. Blended Teaching Reform based on Modular Teaching

Teaching content includes teaching materials and supporting teaching resources, which is an important basis and prerequisite for the effective development and implementation of teaching. The diversified teaching resources can show the teaching content from multiple dimensions, so that students can focus on the teacher's thinking progress and complete the educational goals of the class. For students in vocational colleges, the content of this course has many operation steps, many links of operation and memory, and strong intersections and comprehensiveness between disciplines. Therefore, in the process of teaching, the coherence and richness of teaching content play an important role in achieving teaching objectives and improving teaching effects. The abundance of teaching resources can greatly attract students' attention, so that students have more time for self-study.

Industrial Configuration Control Technology is a professional extension course for students majoring in intelligent control in higher vocational colleges, which plays a very important role in the professional work. Smart Classroom is an online teaching platform, which can realize effective classroom management and teaching implementation before, during and after class. At the same time, it can establish and improve course resources, and has more comprehensive teaching activities, including brainstorming, voting questionnaire, student rating, question-and-answer discussion, etc. In the academic year 2023-2024, the course "Industrial Configuration Control Technology" of the Intelligent control major of Ruian College of Wenzhou Vocational and Technical College adopts blended teaching to carry out teaching reform practice. As shown in Table 1, the combination of online and offline course content is illustrated in Chapter 2.

Table 1. Network content teaching and classroom teaching

Module	Inquiry learning content	Online resource	Offline classroom	Multiple evaluation
Configuration interface design of water level control system	How much power does the pump use?	Water pump motor classification, characteristics PPT and video	Pump motor summary commonly used brand mind map quick answer	Selfevaluation Interactive interface evaluation
	How does the switch of the reversing valve drive?	Reversing valve type and work process PPT video animation	Application of reversing valve signal in man machine interface	Selfevaluation Interactive interface evaluation
	What is the signal type of the water level sensor?	Signal type PPT video	Structure and characteristics of water level sensor Hand drawing, brainstorming	Selfevaluation Interactive interface evaluation

6. Implementation Process of Blended Teaching Reform

The learning phase. Due to the modular skills assessment stage, each score of the same group is the same, and the assessment results of the students participating in the assessment on behalf of the group determine the results of the group, so the group's results are required to be the same. At the same time, due to the many modular skill points each time, there are often technical problems, at this time, team cooperation is needed, through consulting materials, consulting and other ways to solve the problem, which greatly exercises the students' learning ability and innovation ability.

Assessment stage. The students who participated in the assessment on behalf of the group, some successfully passed the assessment, some may fail the assessment, at this time, the other members of the group either complained or comforted and encouraged. This stage is an excellent time to integrate ideological and political education into the curriculum, and guide the team that has passed the assessment to continue to work hard and prepare for the next module assessment. For the group that fails to pass the assessment, the instructor should intervene in time to provide guidance and education on teamwork, mutual care and friendliness, so that the students participating in the assessment on behalf of the group

can put down the pressure, and the other members of the group can better understand how to urge each other to make progress together in the follow-up study.

The pilot teaching reform has been implemented for one semester, and the teaching mode has completely subverted the previous conventional mode. The pilot effect is good, mainly reflected in: students have made obvious progress in skill level; Team work, self-learning and management have been a good exercise; At the same time, labor education, craftsman spirit and curriculum thinking and politics are integrated into the whole process of teaching and learning, which reflects the fundamental of moral cultivation.

There are also some problems in the pilot reform: due to the lack of actual project experience of full-time teachers in schools, there is still a certain gap with the level of enterprise development, and it is difficult to truly improve the level of teacher project development through short-term enterprises or short-term teacher training channels, and it is difficult to carry out external projects and technical services. The training goal of the pilot class is to train the students to be software engineers with software development level. In the later stage, an enterprise engineer with rich software development experience is needed for technical support.

7. Conclusion

Professional extension course plays a very important role in the cultivation of talents and professional quality in higher vocational colleges. It needs to emphasize practice and cannot ignore the cultivation of students' ability and quality. The mixed mode of online and offline teaching challenges the traditional education, and solves the problem of traditional teaching mode effectively through modern information technology. Modular teaching content can realize the organic combination of online and offline classes, which will bring great space for the improvement of teaching effect. Nowadays, the update of teaching environment and tools makes teachers' teaching ability improve day by day. At present, the characteristics of learning subjects are gradually distinct, and the goals of teaching are gradually determined. Teachers need to make continuous progress and change, change their teaching concepts, update teaching methods and teaching modes, so as to adapt to the new environment, achieve higher teaching goals and better teaching effects.

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