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Exploration and Practice of Repair Course Teaching based on Systematic Work Process

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Abstract: The systematic teaching mode of work process has always been an important topic in the curriculum construction of higher vocational and technical education and training level in non-commissioned officer schools. The teaching mode is guided by the actual post ability (work process) needs of social sergeant, and builds a complete and systematic teaching and learning process to cultivate students' post working ability. Taking the course of equipment repair as an example, this paper applies the systematic teaching mode of work process to the course, and carries on exploration and practice. Its core goal is to train the highly skilled military technical personnel who can solve practical problems and adapt to the need of equipment support for the society.

Keywords: Systematization of Working Process; Repair Course; Teaching; Exploration and Practice.

1. Introduction

Higher vocational and technical education is an important part of national higher education. The overall goal of higher vocational and technical education is to cultivate application-oriented technical talents facing the needs of society. Vocational and technical colleges are mainly to train highly skilled technical personnel in the society, while higher vocational and technical education is the main training type of vocational colleges. The whole process of training is mainly oriented to post ability students, based on training skills, and focused on improving the ability to solve practical problems. Therefore, it is necessary to establish a curriculum system that ADAPTS to student training and develop teaching models corresponding to different courses.

2. The Connotations of the Systematization of Work Processes

In the 1990s, Professor Felix Rauner of the University of Bremen in Germany proposed the concept and method of vocational education curriculum based on work process. The so-called work process is "a complete work procedure carried out in the enterprise to complete a work task and obtain work results", "is a comprehensive, always in motion but relatively fixed structure of the system".

At the beginning of the 21st century, Chinese professor Jiang Dayan combined the advanced vocational education concepts of Germany, Switzerland and other European and American developed countries with the characteristics of Chinese local vocational education, and creatively put forward the concept of systematization of work process. Higher vocational education is guided by the post-graduation employment requirements, and the application of teaching mode must be based on the requirements of the corresponding post-graduation work tasks for students. Therefore, in the design process, we must fully reflect the subject status of the students, with the goal of cultivating post ability, and promote the sustainable development of the students. By comparison, the course teaching model of systematic work process is just suitable for the post courses in higher vocational and technical education.

The reason for the difference between different occupations is that the work process is different. The training of vocational and technical education students is oriented towards social skills, and the core feature of its ability is "ability to do". Whether you can be competent for your post after graduation is mainly tested by "doing". Vocational college teachers to teach and students to learn, in fact, is how to "do" knowledge. The design of the work process systematic curriculum takes the work process as the reference system of knowledge ordering, its essence is to integrate the professionalization factor of higher vocational curriculum - work and educational factor - curriculum, which is a two-way transformation and integration of curriculum work and work curriculum. Curriculum work is to "turn" the curriculum into work, "turn" into work, through learning to do, do to learn, teaching and practice combined, practical integration, from which students can obtain the future career required "do" ability. The curriculum of work is a process of course content system that transforms the work of pure posts into one of science and reality. Through the study, students can gain a perceptual understanding of the actual work process and obtain practical work experience.

3. Work Process Systematic Teaching Model Application Practice

The basic idea of the construction of the systematic teaching model of work process is to derive the relevant "action field" from the relevant "learning field" of different posts in the higher vocational and technical education system, and then make it concrete through the "learning situation" suitable for teaching. The essence of this process can be summarized as "action field - learning field - learning situation". The core idea of systematic course teaching mode of work process is that higher vocational and technical education should cultivate students' ability of corresponding positions, course teaching design should be based on work process, and teaching should be action-oriented. The guiding ideology of the systematic teaching mode of work process is to learn through the whole and continuous "action" process, and its foundation is the post work process.

In the following, the course "Equipment construction and Repair" of armor equipment maintenance major is taken as an example, and the teaching practice is applied through the systematic teaching mode of work process.

3.1. Teaching Mode Design Ideas

The design idea of the teaching model based on the systematic work process first needs to grasp the ability needs of students corresponding professional positions, and this process requires a high degree of connection between the school and the society to form the corresponding job tasks. The next step is to design the teaching process and strategy according to the corresponding post ability requirements, conduct the teaching organization and implementation, and give feedback and evaluation after the course. The specific implementation steps are shown in Figure 1.

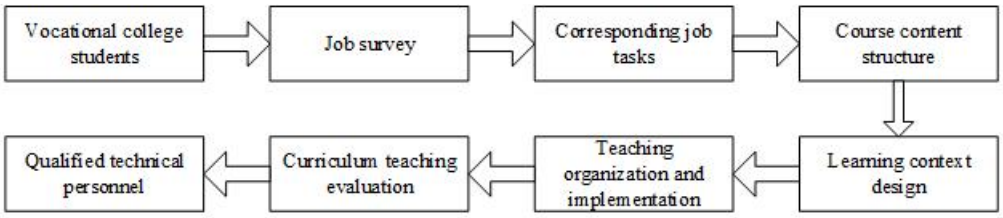


Fig 1. Work process systematic teaching model design steps

Vocational college maintenance students after graduation for organic electricians, sheet metal workers, hydraulic electricians, fire fitters and other technical positions. For different types of work, the knowledge, skills and quality requirements of corresponding courses can be summarized by analyzing the tasks of corresponding positions. Taking the general equipment course as an example, its corresponding post ability requirements are shown in Figure 2.

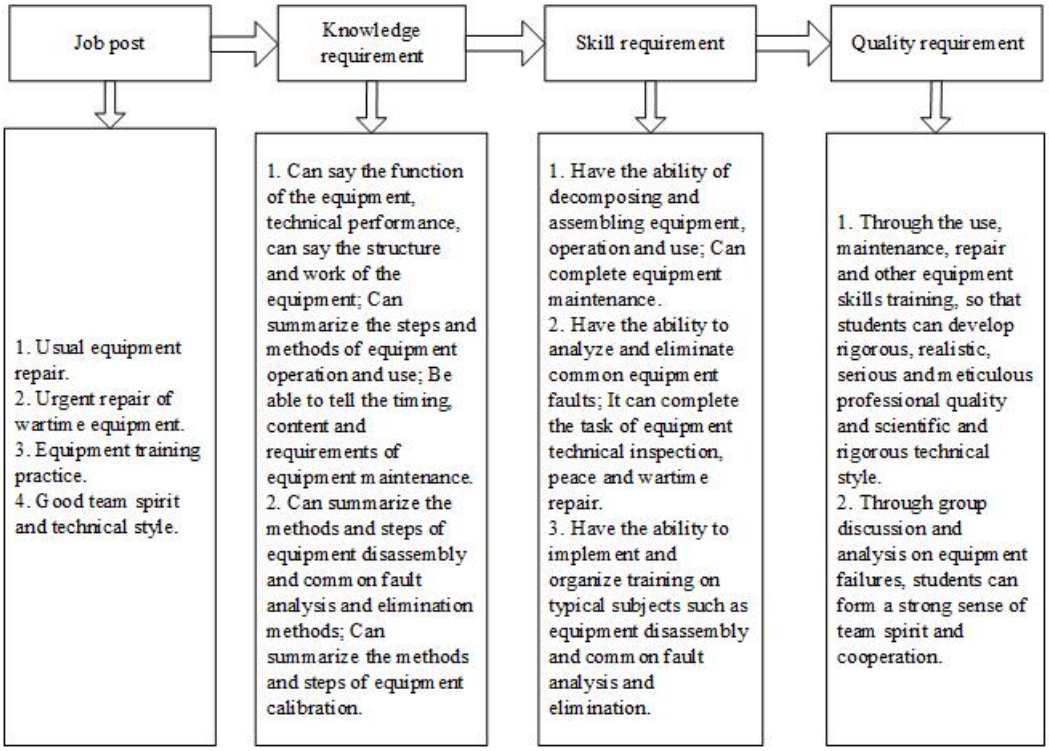


Fig 2. The course corresponds to the post ability requirements

3.2. Reconstruction of Teaching Content

Through the analysis of post skill requirements, according to the teaching mode design idea of systematic work process, the teaching content is reconstructed and the teaching situation is designed. Each teaching situation is a complete and independent task, which is completed in the form of group cooperation. The knowledge system is transformed into the ability system, which is applied to the work process, so that the knowledge system of the students is closely combined with the requirements of the post, and the improvement from knowledge to ability is realized. The reconstruction of teaching content is shown in Figure 3.

3.3. Task-based Teaching Organization and Implementation

In the process of teaching organization, besides the learning of knowledge and skills, more attention should be paid to the cultivation of students' learning ability and problem-solving ability. In the process of situational teaching, the active teaching method is adopted, and the teaching methods such as task-driven, brainstorming, group discussion and case analysis are comprehensively used to stimulate the enthusiasm of students. The following takes equipment decomposition and assembly as an example, and the design of task-based teaching organization is shown in Table 1.

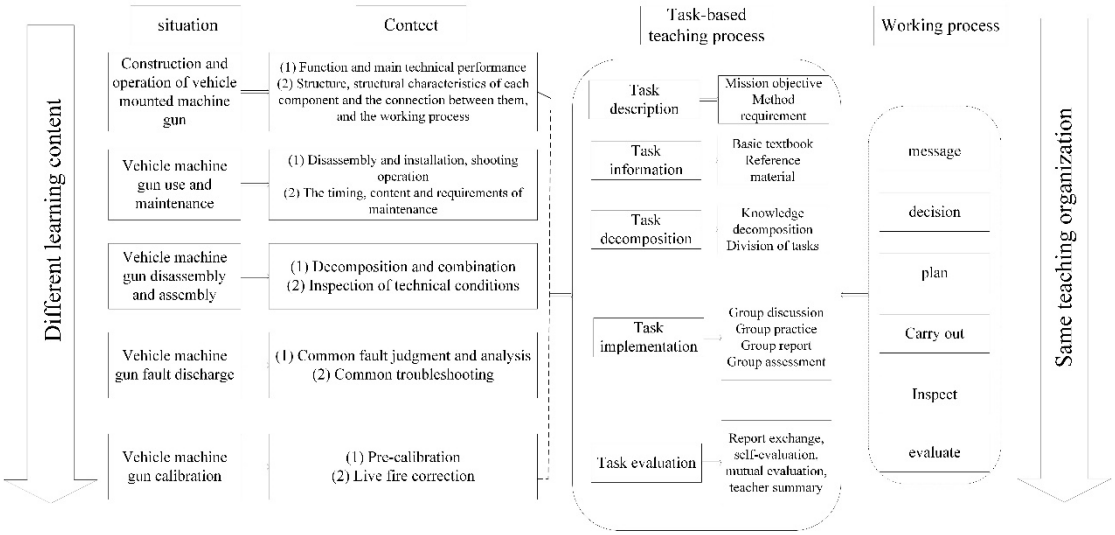


Fig 3. reconstruction of teaching content

Table 1. Organization and implementation process

Learn situational		device decomposition and assembly			
Task requirement		Students master the methods and steps of equipment decomposition and assembly by decomposing and assembling the equipment.			
Task organization implementation process		Teacher task	Student task	Allocation of hours	Teaching method
	message	Issue task books, emphasize job requirements, and introduce theoretical knowledge points	Understand the assignment, familiar with the work requirements and objectives, master the methods and steps of equipment decomposition and assembly	2	Theory teaching Equipment practice
	decision	Explain the working process of the equipment, the principles of decomposition and assembly and matters needing attention	Consult relevant professional information, review most components of equipment, prepare equipment maintenance tools	2	
	plan	Guide students to develop the work plan of decomposition and assembly, and organize students to group and task decomposition	Make work plan, refine and sort out the task process, and break down the task to team members	4	
	implement	Explain demonstration guide students' decomposition and assembly, explain the use of maintenance tools, guide students to complete the technical conditions of the equipment	Master the use of maintenance tools, and be able to independently complete the task of equipment decomposition and assembly	4	Explain and demonstrate Group training
	check	Check the work of students, organize students to report the completion of tasks	Conduct discussion and analysis within the team, sort out the completion of the task, and report	2	Oral defense
	evaluate	Make a comprehensive evaluation of the students' task reports and technical documents, and fill in the score sheet	The group conducted self-assessment, mutual assessment, and completed the course learning feedback card and suggestion form	1	

3.4. Course Assessment and Evaluation Methods

Compared with the more traditional assessment methods, the teaching mode based on the systematic work process adds formative assessment, which aims to stimulate students' enthusiasm in the whole process of learning and improve their learning initiative and pertinancy. The course assessment and evaluation methods are shown in Table 2.

Table 2. Course evaluation methods

Assessment category	examination	Evaluation method	Centesimal system
1. Formative assessment (proportion of total score: 50%)			
Serial number	**Study project**	Examination form	scale
1	Construction and use of equipment	Oral defense	50%
2	Repair of equipment	Oral defense	50%
2. Final assessment (percentage of total score: 50%)			
Examination form	Practical operation assessment	Question source	Item bank

4. Conclusion

At present, the systematic teaching mode of work process has become the consensus of vocational and technical education. By exploring the teaching of equipment repair courses based on the systematic work process, this paper solves the problem that students are not closely connected with the job requirements in the process of knowledge learning. The teaching content is reconstructed according to the ability they should have in the actual post after graduation, and task-based teaching method is adopted to organize and implement teaching, so as to realize the transformation of student-oriented and instructor-oriented. Focus on the cultivation of students' professional knowledge and practical skills, improve students' dual ability of "knowledge" and "skills", in line with the goal of application-oriented talent training for students at the level of higher vocational and technical education.

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