



Discussion on the Mixed Teaching Mode of Comprehensive Experiment of Oil and Gas Storage and Transportation

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Abstract: Combined with the actual situation of the teaching of oil and gas storage and transportation in our school, this article first analyzes the teaching status of oil and gas storage and transportation, and then analyzes the application necessity of the “case teaching method plus experimental teaching method” mixed teaching mode in the oil and gas storage and transportation profession, and then further research and discussion on case teaching and experimental teaching.

Keywords: Oil and Gas Storage and Transportation; Case; Experiment; Mixed Teaching Mode

With the development of China’s economy, China has gradually increased its demand for oil and gas resources, and ensuring the safety of oil and gas storage and transportation is the current key task of oil and gas storage and transportation staff. Nowadays, oil and gas development companies have also increased the safety requirements for oil and gas storage and transportation. In colleges and universities, special attention is paid to the teaching of oil and gas storage and transportation. Therefore, the case teaching method combined with the experimental teaching method is introduced in the oil and gas storage and transportation specialty. Teaching is carried out in a mixed teaching model to improve teaching effect and teaching quality.

1. The necessity of blended teaching

The characteristics of the professional courses of oil and gas storage and transportation are comprehensive and professional. If the traditional teaching methods are still used in the teaching process, this will cause the students to be less motivated to learn, and students lack practical knowledge while learning theoretical knowledge, which affects the interest in learning, and cannot analyze and deal with safety issues of oil and gas storage and transportation. Therefore, it is imperative to apply a blended teaching model in the teaching process of oil and gas storage and transportation professional courses^[1]. The blended teaching model is a combination of “case teaching method” and “experimental teaching method”. In the teaching process, by analyzing and learning oil and gas storage and transportation safety accident cases, it is possible to analyze the cause and course of safety accidents, and further allow students to learn preventive measures, which will fundamentally strengthen students’ accident analysis and handling capabilities. In the case teaching process, the teacher asks the students to check the relevant materials before class, and first simply understand the cause of the safety accident, so as to further analyze how to deal with the accident is the most appropriate. In the case teaching process, the teacher analyzes and summarizes the safety and the accident. Students will write a study report on oil and gas storage and transportation safety accidents through discussion after class. In this way, through case teaching, teachers and students have got full interaction and effective communication during the teaching process which can help students improve their ability to use knowledge. The experimental teaching method is mainly for

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teachers to complete the practical teaching of the professional courses of oil and gas storage and transportation through various experimental teaching, so that students can understand and learn knowledge in a simulated real environment, thereby further deepening students' understanding of oil and gas storage and transportation knowledge.

2. Implementation of case teaching

The process of case teaching is mainly divided into the following stages. The first is the establishment of oil and gas storage and transportation safety accident cases. The second is that students discuss the accident cases in groups, and the third is teacher summarizes the accident cases.

2.1 Present a case

In the teaching process of oil and gas storage and transportation, the principles for selecting accident cases are as follows: the case is educational and universal, and the case only centers on the teaching objectives and teaching content, which is consistent with the teaching situation of the oil and gas storage and transportation specialty. The key to case teaching is to choose teaching cases. This is an important process. The accident cases selected by teachers have certain typicality, which can fully resonate with students and allow students to think actively^[2].

2.2 Discuss the case

After the teacher explained the safety accident case to the students in detail, the students started group discussion. Case discussion is the key joint in case teaching. In the process of student case discussion, the teacher should actively guide the students and avoid them. Correct the correct view in time. Case discussion is a process of comprehensively cultivating students' safety awareness, as well as a process of learning and thinking.

2.3 Summarize the case

After a sufficient case discussion, the teacher summarizes the students' different viewpoints. Through the process of summing up, the purpose of case teaching can be realized, which is to enhance students' learning enthusiasm, stimulate students' interest in learning, and further promote students' initiative Learning and active thinking can improve their understanding of oil and gas storage and transportation knowledge^[3].

3. Implementation of experimental teaching

The following types of experiments are mainly developed in the professional courses of oil and gas storage and transportation, which are basic experiments, comprehensive experiments, design experiments, and research experiments. These four types of experiments have different characteristics, so they need to be separated for experimental teaching.

3.1 Basic experiment

Basic experiments are mostly measurable and confirmatory experiments for oil and gas products, crude oil, etc. The experiments are generally carried out in accordance with industry standards or national standards. In the past experimental studies of oil and gas storage and transportation, students only paid attention to the correctness of experimental measurement data, and fundamentally neglect to truly understand the experimental principles, so it is necessary to increase the mastery of the experimental principles in the assessment of basic experiments. Basic experiments involve oil and gas samples, low-temperature operations, high-temperature operations, and precision instruments. Therefore, safety is the most important in the process of experimental operations. Therefore, the assessment of students' safety knowledge is added during the assessment process^[4]. After adjusting the basic experimental teaching content, the teaching content mainly includes investigating experimental methods, principles, experimental operating procedures, experimental operating specifications, experimental operating procedures, safety knowledge, equipment preparation before the experiment, experimental data recording, experimental data analysis, and experimental data Processing, experimental thinking, and experimental report, etc.

3.2 Research experiment

Research experiment teaching focuses on cultivating students' comprehensive quality and innovation ability. Research experiments are mostly open experiments that combine teaching and scientific research, subject competitions, and graduation thesis topics. It is known that the teaching cycle of research experiments is long, and students need

professional guidance from teachers during the learning process. Obviously, traditional experimental methods, experimental principles, and experimental contents are not suitable for research experiments. The assessment content of research experiments should include research purpose, ability to consult literature resources, rationality of experimental methods, ability to write papers, practicality of research results, experimental innovation ability, as well as experimental results processing ability, induction ability, analysis ability and summary ability, etc.

3.3 Design experiment

In oil and gas storage and transportation, oil and gas storage and transportation equipment and oil and gas long-distance pipeline installations are relatively complex projects, which mainly involve processes, equipment, materials, and instruments. Among the professional courses of oil and gas storage and transportation, it is the most design experiment, such as receiving and dispatching oil management simulation and process design, long-distance crude oil pipeline scheme design and simulation, etc., all require students to apply the knowledge they have learned to design experimental schemes and perform software simulation^[5]. Therefore, the assessment content for design experiments should not only include the recording of the experimental process and the knowledge of memory principles, but also the design of experimental schemes, experimental analysis, experimental processing, experimental thinking and experimental summary, etc., so that students can be guided to think about knowledge points, to promote from passive learning to active learning, and to experiment and innovate, which deepens students' understanding of the knowledge they have learned, and improve their ability to solve problems.

3.4 Comprehensive experiment

The purpose of comprehensive experimental teaching is to cultivate students' comprehensive application ability and understanding ability of professional knowledge of oil and gas storage and transportation, such as oil pipeline water hammer control experiment, pipeline closed transportation operation simulation experiment, oil field gathering pipeline network operation simulation experiment, etc. The experimental methods and principles of the experimental experiments involve multiple key knowledge points in the professional courses of oil and gas storage and transportation. In the comprehensive experimental assessment, the content of testing experimental skills and professional knowledge is added, mainly including the assessment of knowledge points such as experimental methods, experimental principles, experimental equipment, experimental instruments, experimental data processing, and experimental data recording, and focuses on summarizing the comprehensiveness. The problems in the experiment and the means of improvement.

4. Conclusion

In general, the teaching reform of oil and gas storage and transportation is a systematic project, which not only requires teachers to have scientific teaching concepts and professional knowledge reserves, but also requires teachers to reasonably apply brand-new teaching methods to carry out teaching. Only then can the school form a complete teaching system of case plus experimental teaching, to achieve better teaching effects and train batches of professional oil and gas storage and transportation talents for the society.

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