

Research on the Application of Video Feedback Interactive System in Vocational Education Practice Teaching

Dongsheng YANG

Aviation Maintenance NCO School Air Force Engineering University, Henan, China

Myds702@163.com

Abstract. In view of the problems existing in traditional vocational education, such as lack of practical operation equipment, teachers' inability to supervise and guide one to one, and the lack of effective recording of students' practice, this paper proposes to build a video feedback interactive teaching system and review and analyze the recorded videos of practical operation with the help of intelligent video recording and broadcasting system.

Keywords: Vocational education; Practical teaching; Video feedback interactive system

1 Introduction

Practical teaching is an effective way to consolidate theoretical knowledge and improve the effect of theoretical teaching, and is an important link in the vocational education personnel training system Vocational education takes the cultivation of high quality technical talents as its own duty, which determines the special position and important role of practice teaching in higher vocational education. The weak practice teaching link has been considered as the root cause of the lack of function of vocational education, so it is of great significance to carry out the research and exploration of the practice teaching system of higher vocational education extensively.

Practical teaching of vocational education is a kind of teaching method that aims at improving ability and achieves teaching purpose by participating in activities related to the content of practical teaching objectives. Its essence is to set up a place to encourage learners to absorb knowledge into their own experience of the transformation process, its main forms include experiment, school practical training, training, course design, graduation design and so on. At present, compared with theoretical teaching, practice teaching has the following outstanding problems.

The acquisition of knowledge, the improvement of skills and the development of abilities of students should be implemented in the classroom teaching, and all need to be practiced in specific teaching methods. Experts believe that the basic idea of practical teaching is to let students actively participate in teaching and actively explore learning, and to realize this new learning mode, it is necessary to change the traditional

[©] The Author(s) 2024

Y. Chen et al. (eds.), Proceedings of the 2023 3rd International Conference on Modern Educational Technology and Social Sciences (ICMETSS 2023), Advances in Social Science, Education and Humanities Research 784, https://doi.org/10.2991/978-2-38476-128-9_58

484 D. Yang

teaching mode^[1]. Some experts believe that in the process of searching for effective teaching models, people gradually find that there are many ways to fully mobilize the enthusiasm of students, such as practical practice, role playing, task-driven and group discussion^[5]. In these methods, students can give full play to their initiative and enthusiasm, take the initiative to participate, fully think, dare to explore and innovate. The practice of Liu Deyun et al. shows that the effectiveness of teaching will be significantly improved as long as the classroom situation can be created for the enhancement of students' enthusiasm^[3]. Jeanne R. Paratore et al. believe that the subject course content is closely related to and closely coordinated with the job position^[4]. In teaching, a large number of basic practical skills and operation rules of each specialty are involved, and the knowledge contained in the teaching content is often very broad and abstract. In order to connect these strong logical and practical knowledge content with professional activities, and let students master it, there needs to be a strong teaching model to support. Lindsey N. Miller^[2] believes that all colleges and universities are exploring the teaching mode suitable for vocational education, and at the same time, according to the organic combination of different regional characteristics, characteristics of different colleges and universities, different course forms and different teaching conditions, the teaching mode with its own characteristics has been formed.

The development of most practical teaching activities requires the construction of equipment and venues to meet the practical needs, which is restricted by various conditions. In most practical teaching courses, group teaching is adopted due to the lack of practical equipment, which is difficult to meet the teaching needs, and the practical efficiency is often very low.

The management system of practical teaching is not perfect, and the examination means is lacking, which leads to the practical examination is just a formality, and the situation of going through the motions is serious. It is precisely because the teaching quality evaluation and examination system is not perfect that the practical teaching quality is difficult to guarantee^[3].

As a result, students can not really accept the teaching effect they should have, and their practical operation ability is only slightly exercised on the surface to a large extent, but has not been truly improved, and is still far from the requirements of professional posts.

2 The Constructions of Practical Teaching Mode of Video Feedback Interactive System

The interactive teaching mode based on video feedback has changed from multimedia courseware to information system^[6]. Therefore, in terms of teaching preparation, it is no longer a single teaching plan plus multimedia courseware in the past, but to expand to electronic teaching plans, picture viewing, network teaching, recording and broad-casting system and many other teaching means, which requires teachers to prepare for class and organize teaching according to the teaching object and the early teaching situation. In the preparation stage of traditional practical teaching, the teachers mainly do the following aspects of work: understand the teaching objects, organize students to

hold teaching contact, understand the students' educational structure, professional background, learning basis, etc., to prepare for the course; Do a good job of lesson preparation, mainly for class design, teaching plan writing and teaching demonstration production; Do a good job in guaranteeing teaching resources, ensure that the multimedia equipment used in class is normal, and can meet the teaching requirements. The distributed interactive teaching system consists of four parts: interactive whiteboard teaching system, server, HD camera system and handheld control terminal.

2.1 Interactive Whiteboard Teaching Systems

Interactive electronic whiteboard is a new teaching media including hardware system and software system, it has significantly different technical characteristics and teaching characteristics from traditional conventional media and multimedia demonstration system, such as compared with multimedia demonstration system can obviously support dynamic generation of classroom teaching, teachers can input new content at any time and store and display. The interactive whiteboard is easy to control the presentation process of the presentation materials, and the teacher can control the playback of the presentation materials without operating in front of the main console. The use of interactive whiteboard technology can instantly, conveniently and flexibly introduce various types of digital information resources, and can flexibly edit, organize, display and control multimedia materials, which makes the presentation of digital resources more flexible, thus having better teaching effect than a single whiteboard teaching, and also solves the problem in the past multimedia projection system environment. The problem of using courseware and slide lecture notes to teach material structure is highly solidified.

2.2 HD Camera Systems

The HD camera system is directly installed on each station workbench through the bracket, and can freely move the camera system's Angle of view according to the recording Angle. It is mainly responsible for sending the equipment field operation process back to the server by video. The display system, all teaching activities, operation process, and students' practice can be automatically recorded and stored in the whole and full-time. According to the needs of its supporting software, the partition positioning, zoom and other functions of the operation of the local close-up intelligent tracking high-definition shooting, so that all students can see the operation clearly, thus greatly improving the teaching efficiency and effect. The image of the camera system is sent back to the classroom server and stored, and the teacher can call and play back on the whiteboard system at any time through the control terminal, so as to realize the diagnosis and evaluation of all staff and all subjects anytime and anywhere. Students can see all operations and their results at the same time to meet the urgent needs of practical teaching links such as equipment teaching operation and use, cause analysis and so on. 486 D. Yang

2.3 Video Feedback Interactive System Servers

As the control and storage terminal of the whole system, the server uses network cable and data transmission line to collect the recording screen of each station, and realizes the storage, distribution, display and other functions. By relying on the wireless network, the video data is transmitted to the electronic whiteboard for broadcast, and the mobile terminal realizes the control of each camera and system through the wireless network of the server.

2.4 Handheld Control Terminals

The handheld control terminal is used to control all the above systems in the entire equipment teaching site. Through the wireless network provided by the server, high-definition cameras and electronic whiteboards in the wireless network coverage area can be controlled. At the same time, the handheld mobile terminal relies on the wireless network to achieve command transmission, and the teacher can control and use it anywhere in the classroom, making the teacher's position more convenient and flexible without being confined to the platform.

3 The Application of Video Feedback Interactive System in Practical Teaching mode

In accordance with the idea of video feedback interactive system, we follow the internal logic line of ability generation from complex to simple, from comprehensive to single, pay attention to the internal connection between skills and theories, sort out typical work tasks, and serial cluster classroom learning tasks.

3.1 Benchmarking the Job Requirements and Keeping Close to the Content of Job Planning

Focus on the ability, highlight the course teaching practice, adhere to the combination of theory and practice teaching, ability improvement and post needs combined, teaching content and post closely docking, the post task penetration, embedded in the learning task, effectively improve the teaching pertinence.

3.2 Track the Theoretical and Technological Frontier and Synchronize the Development of Docking Equipment

Keep up with the forefront of post development, timely integrate new technologies, new materials, new processes and new equipment into the teaching content, and realize synchronous integration with post equipment and technology. In view of the accelerated pace of the development of post equipment, appropriately set new equipment, increase subjects, and deepen the content.

3.3 Optimize Course Assessment and Evaluation to Improve Learning Results

The course is organized according to the ideas of thinking before class, exploring the process of task in class and familiar with the process of task after class. Before class, teachers publish learning tasks through the network teaching platform, and students receive tasks through the platform, discuss and communicate, and complete the tasks. In the class, a typical task is divided into several small learning tasks according to the operation points, and the students' operation is played back through the recording and broadcasting system to find out the operation deficiencies, summarize the core points, and finally make a summary. After class, the students use the interactive system to practice, upload the video recording of the practice, and the teacher grades and completes the class evaluation. Comprehensive use of teaching and training platform and recording system, to achieve full, full course, full subject assessment, ensure the assessment of objectivity, fairness, openness, stimulate students' learning enthusiasm and team awareness of competition and cooperation, effectively promote the improvement of teaching quality.

This course grade is assessed by a combination of formative (30%) and final (70%) tests. The formative assessment takes the form of multi-dimensional evaluation, forming the form of feedback evaluation combined with self-evaluation and mutual evaluation. The formative assessment relies on the interactive system of video feedback, which will include learning attitude, maintenance style, practice effect and other contents in a comprehensive and three-dimensional way. Through the situation of students completing internship tasks, learning attitude, and the quality of homework completion, the students will evaluate each other and self-evaluate, and the teachers will evaluate and score the above factors, accounting for 30% of the total score. This evaluation method is more objective and can mobilize the enthusiasm of students to "learn, do and compare".

In order to effectively support the implementation of inspection and evaluation, the course has designed a learning effect evaluation table to standardize the scoring rules, which can record and display students' procedural operations in real time, and realize the dynamic monitoring of students' learning status and real-time video recording and playback of the learning process. On the one hand, by recording students' operation, each student's learning situation can be diagnosed and evaluated, making the problem analysis more targeted. On the other hand, each student's skill operation is recorded, which provides a basis for teachers' evaluation, stimulates students' learning enthusiasm and team competition and cooperation consciousness, and effectively promotes the improvement of teaching quality.

The final assessment is a combination of theoretical assessment (28%) and practical assessment (42%). The theoretical examination is organized in the form of closed-book, which mainly focuses on students' understanding and application of knowledge points. Practical operation assessment takes the form of practical operation, randomly selected a subject for skill assessment. The assessment process is recorded by video feedback

488 D. Yang

interactive system. This assessment method can not only test students' grasp and understanding of theoretical knowledge, but also highlight the importance of skill operation and enhance students' ability to take the first position.

4 Conclusion

The practice teaching mode based on video feedback interactive system has been fully implemented in many courses of our school. On the whole, in the whole teaching process, the students' learning enthusiasm continues to improve, their learning attitude is gradually correct, and they can complete the learning tasks assigned each time. According to the questionnaire survey of students, the students are satisfied with the teaching mode, and think that the teaching mode is suitable for their learning, with high enthusiasm, strong interest and good learning effect. From the examination results, since the practice of the practical teaching mode based on the "video feedback interactive system" has been carried out, the pass rate of the final exam has been above 90%, the average score has increased year by year, and the pass rate of the practical operation assessment is close to 100%.

References

- Jeanne R. Paramour, Lisa M. O'Brien, Laura Jiménez, Alejandra Salinas, Chu Ly. Engaging Preserver Teachers in Integrated Study and Use of Educational Media and Technology in Teaching Reading [J]. Teaching and Teacher Education, 2016, (59): 247-260.
- 2. Lindsey N. Miller, Susan L. Mercer. Drugs of Abuse and Addiction: An integrated approach to teaching [J]. Currents in Pharmacy Teaching and Learning, 2017, (9): 405-414.
- 3. Spence AD, Derbyshire S,, et al. Does Video Feedback Analysis Improve CPR Performance in Phase 5Medical Students[J]. BMC Med Educ,2016,16(1):203.
- 4. Sowan AK. Evaluation of an Interactive Web -based Nursing Course with Streaming Videos for Medicationb Administration Skills[J]. Int J Med,2014,83(8):592-600.
- Srinivasan M, Hauer KE, Der Martirosian C, et al. DoesFeedback Matter Practice-based Learning for Medical Stu-dents after a Multi-institutional Clinical Performance Ex-amination[J]. Med Educ,2007,41(9):857-865.
- Crenshaw JT. Use of Video-feedback, Reflection, and In-teractive Analysis to Improve Nurse Leadership Practices [J].Nurs Admin Q, 2012,36(3):260-267.

Open Access This chapter is licensed under the terms of the Creative Commons Attribution-NonCommercial 4.0 International License (http://creativecommons.org/licenses/by-nc/4.0/), which permits any noncommercial use, sharing, adaptation, distribution and reproduction in any medium or format, as long as you give appropriate credit to the original author(s) and the source, provide a link to the Creative Commons license and indicate if changes were made.

The images or other third party material in this chapter are included in the chapter's Creative Commons license, unless indicated otherwise in a credit line to the material. If material is not included in the chapter's Creative Commons license and your intended use is not permitted by statutory regulation or exceeds the permitted use, you will need to obtain permission directly from the copyright holder.

