

Discussion on Cognition Practice under Cloud Practice Mode

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Abstract

Cognitive practice is one of the most important courses in university classes. This article introduces the practical discussion of cognitive practice from offline to online under the background of the COVID-19 threatens, the healthy development trend of Internet, and the state's encouragement of "non-stop classes" for online learning. By analyzing the practice cases of cloud practice in engineering management major, this paper summarizes the advantages of cloud practice, and puts forward improvements to its shortcomings to obtain better teaching results.

Keywords

Cognitive practice; Engineering management.

1. Introduction

American colleges and universities attach great importance to the cultivation of students' practical ability. The purpose of setting up cognitive practice courses is to help students understand majors and industries preliminarily, and clarify the nature of majors, professional fields, core competencies, professional environment, etc. Its practical courses form a system, including three stages: basic cognitive practical courses in the freshman stage, professional quality cultivation practical courses in the sophomore stage, and in-depth comprehensive practical courses in the junior stage.

Colleges and universities in China also have a similar practical teaching system. Cognitive practice belongs to the preliminary level of practical courses, which mainly provides professional cognitive education.

Cognitive practice is an important teaching link in the teaching plans of various majors in Colleges and universities, a teaching form of various majors in Colleges and secondary professional schools, and one of the important means and methods for students to integrate theory with practice and increase practical knowledge during their study at school. Before learning the main professional courses, through field visits, hands-on practice and other activities, the purpose is to make students understand the future work situation, gain perceptual knowledge, enhance the connection between theory and practice, and prepare for academic professional courses.

The traditional cognitive practice refers to the activities that students visit, observe and experience the internship units organized by vocational schools to form a preliminary understanding of the internship units and related posts. The main teaching methods are on-site explanation or demonstration by teachers or on-site staff. With the development and progress of the times and some objective factors, cognitive practice combine with science-tech and the Internet. For example, in the epidemic era, as a new method, cloud cognitive practice has been launched.

2. Cognition Practice of Engineering Management Major

The cognitive and practical practice of engineering management specialty is particularly important for the engineering management specialty affiliated to engineering college. The

cognitive practice course of this major is mainly set in the first year of the University, and its development time is the stage when the students have not had a deep understanding of the core needs and prospects of this major after some basic courses (such as descriptive geometry and residential buildings). As the first practical course of this major, cognitive practice can help students recognize and understand the engineering management major, improve students' professional interests, and is an important link to establish professional concepts and establish a sense of professional responsibility[1]. At this time, cognitive practice is mainly to help students establish a further understanding of their professional scope, professional learning objectives and different from the entrance education, and improve their professional identity and self-confidence.

For students majoring in engineering management, through cognitive practice, they can enhance their perceptual knowledge of various projects, preliminarily understand the basic requirements and design methods of architectural design, structural design and equipment engineering of different functional buildings, form the basic concepts of buildings, and form the basic concepts of building functions, building structures and building materials, as well as the layout of construction sites. It is an important way for students to build professional knowledge structure and deepen professional cognition to understand the constraints and connections between various management objectives in the process of project construction and the means and significance of achieving various objectives.

3. Current Situation and Characteristics of Traditional Cognition Practice

The cognitive practice of engineering management specialty carried out by our university mainly includes various projects under construction and completed projects. It mainly shows students the overall structure and detail structure of different building structures, the use of main building materials, and the layout and management of the construction site. The implementation methods are mainly student observation and on-site explanation by teachers or engineers. The experience of many years in this work shows that there are the following problems in the arrangement of field practice.

3.1. Potential Safety Hazards

The site environment of the project under construction is complex, the materials are stacked in disorder, the dust is serious, and there are many deep pits, so there are great potential safety hazards in practice. Although we arranged safety education for students at the beginning of the internship and purchased insurance. However, due to the students' failure to form in-depth site safety awareness under the short-term theoretical education, there is still a possibility of injury at the construction site, so there are still large potential safety hazards.

3.2. Limited Teaching Effect

Cognitive practice is generally arranged with 3-4 teachers, so the teacher-student ratio is too small. A teacher has to serve more than 15 students, which can not effectively guarantee the students' listening effect. For example, when explaining the construction process or structural structure in a narrow space, due to space constraints, usually only two or three students closest to the teacher can ensure effective access to the site and listen to the teacher's explanation, while the lectures of other students will be greatly reduced. Moreover, in an unfamiliar and open environment, students' attention is easily disturbed and the teaching effect is greatly reduced.

3.3. Difficulties in Contacting the Internship Site

There are many external restrictions on the selection of internship sites, especially those under construction. For example, the construction site under construction should not be too far from

the school, otherwise the time and funds for observation and practice cannot be borne; Each building on the construction site needs to be in different construction stages to ensure that students can see the construction process or specific process of concealed works. However, in this way, the number of construction sites meeting the above conditions is very small, or even can not be found. Finally, we can only sacrifice some conditions to match the construction site, and the actual learning effect will also be affected.

Additionally, because the number of students majoring in project management is usually about 60-70, the excessive number of students also brings great challenges to the safety management of the construction site. Based on this, most construction sites refuse to accept the students' understanding and practice.

3.4. Limited Time and Funds

The internship is usually arranged for about one week. It takes time to contact the site within a limited time. The funds that schools can provide and the safety of students should be reconsidered. These factors should also be taken into account in site selection.

4. Advantages of Cloud Practice for Engineering Cognition Practice

In the past three years, due to the impact of the objective environment of the epidemic, the implementation of cognitive practice can not follow the previous existing path. In response to the call of the central government to "suspend classes without suspending learning", many new attempts have been made, such as online practice using Dingding, Tencent conference and other software. Among them, cloud internship has achieved good results on projects under construction during cognitive practice time. Through practice, cloud practice has strong feasibility and advantages. Cloud practice can also avoid the problems existing in traditional practice. The following are the problems of traditional practice, the corresponding solutions of cloud practice and the advantages of cloud practice.

4.1. Problems Faced By Traditional Cognition Practice Have Been Solved

By means of live broadcast and Tencent conference, the project commentator explained to the students in front of the camera. It does not need to contact the complex environment of the construction site to solve the potential safety problems. With the change of the lens, the structure that the students can observe is more clear to ensure that each student can clearly hear the explanation of the construction technology by the teacher or the commentator; Learning in front of the screen may suffer less external interference and be more focused; If students have questions on the public screen, the teacher can answer them in time; After the live broadcast, you can also watch the live broadcast playback for after-class learning, and the teaching effect and learning effect can be guaranteed or even improved. Cognitive practice greatly reduces the site selection requirements of projects under construction or completed, increases the types of selection, considers more sites and covers a wider range. The live room can accommodate hundreds of students without affecting each other. The security management work is reduced and the network management work is correspondingly increased. The tutor's task is also much easier, mainly responsible for notifying and distributing materials, organizing students to enter the live room, etc. Cloud internship requires less time and money, saves a lot of time on the journey, and has flexible time and more time to learn.

4.2. Broaden the Scope of Knowledge

The site selection requirements are no longer limited to factors such as distance and capital, and the type of site selection is no longer limited to housing construction projects. Most students majoring in engineering management teach on the basis of building construction engineering. Cloud practice can select the construction process of bridges, dams and other

projects, expand the vision of engineering management students, understand the wonderful projects completed by overcoming geographical factors, let students contact professional practice in addition to theoretical knowledge, and increase perceptual knowledge, thus laying a certain foundation for studying residential architecture, civil engineering materials, building structure, building construction technology and management [2]. The increase in optional types also means room for innovation. Combine residential building knowledge with "Internet +" for innovation, present the knowledge in books in the form of modeling, and make it into pictures or videos to make it more intuitive and easy to understand, encourage students to apply what they have learned, combine innovation with putting forward their own ideas, think about how to improve traditional construction methods, establish their professional concepts step by step, and put theoretical knowledge into mind step by step.

5. Cloud Internship Practice Cases

Cloud practice is a new way to change traditional cognitive practice based on the epidemic and the Internet era. Its characteristics and essence are still as same as traditional practice. Let students learn the actual architecture through cognitive practice observation, further improve students' understanding of architectural culture, architectural knowledge, architectural structure and building materials, consolidate the theoretical knowledge learned, improve students' learning enthusiasm, and lay a foundation for production technology management [3]. However, compared with traditional practice, cloud practice will be carried out faster and more efficiently. Determine the time, select the project, contact the project commentator, notify the students participating in the internship, and complete the assessment step by step through the Internet platform.

5.1. Selection of Internship Scope

Traditional internships tend to choose housing construction. Due to geographical location, practicality and other factors, it is relatively qualified, but it also has certain limitations and one-sidedness. Cloud internship could choose more representative and characteristic projects, such as the internship of Lianghekou power station conducted by the school of architecture and civil engineering of Chengdu University with Tencent Conference software in March 2022, which lied in Yajiang County, Ganzi Prefecture, Sichuan Province . Lianghekou hydropower station is different from the traditional construction site for the advantages of large scale, long construction period, new materials and unique technology, and it has overcome many world-class technical problems because of high altitude, high earth rock dam and high flood discharged velocity. The purpose of choosing this internship site is to expand the vision of engineering management students and stimulate their professional identity.

5.2. Arrangement of Internship Instructors

The content of cloud cognitive practice is mainly on-site practice, which is carefully prepared by the engineering lecturer and tutor, or in the form of live broadcast, or online through video animation. The traditional cognitive training instructors are 3-4 people. The live room only needs to arrange one cloud practice instructor and another engineer to explain the project on site. They can cooperate with each other, release the notice of internship content, play video materials, and answer students' questions. The key point of this link is that during the practice preparation, the practice teacher should fully communicate with the commentator on the practice site; Provide detailed internship explanation requirements to the other party to ensure that the internship explanation content covers the learning needs of students; Determine the duration of the practice instruction, design appropriate interactive links, and convey the preparation requirements before the practice to the students, so as to obtain good practice results.

5.3. Cloud internship Equipment Type

If the internship content is on-site explanation project. internship communication can rely on QQ group, DingDing, Tencent meetings, Tencent classroom or learning live room software on intelligent equipment. As for the machines, cameras, microphones and other equipment used by the project commentators for live broadcast, cloud internship requires very high equipment used for interpretation, and it is necessary to ensure that there will be no problems in the process of use, and the picture quality is smooth and clear. Usually, large engineering sites have their own facilities, and their models and specifications can meet the requirements of practice.

5.4. Questionnaire Survey and Analysis Results

After the content and assessment of the practical course "engineering management and engineering cost understanding" of the school of architecture and civil engineering of Chengdu University in the academic year 2021-2022, the questionnaire survey on the content of the practical course "engineering management and engineering cost" was carried out among 132 new students of 2021 engineering management and engineering cost [4]. Some of the choices are shown in Table 1.

Table 1. Goal achievement questionnaire

Question	Selection
1. Your understanding of the teaching objectives, knowledge and ability training requirements of the cognition practice course.	A. Very clear; B. Clear; C. Basically clear; D. Not very clear; E. Not clear
2. What do you think of the completion of cloud internship for "understanding the project through Tencent conference live broadcast, such as building materials, construction technology, project construction management, architectural design, construction safety and other aspects"?	A. Very clear; B. Clear; C. Basically clear; D. Not very clear; E. Not clear
3. what do you think the extent of the goal achieved that by "watching relevant videos and materials online, you can sort out and summarize the work contents and conditions of professional technical posts and labor posts involved in the awareness practice of this major, and summarize the professional nature and responsibilities of engineers, as well as professional ethics and norms in a way of your own understanding." How is this ?	A. Very clear; B. Clear; C. Basically clear; D. Not very clear; E. Not clear
4. What do you think of the completion of cloud internship for "establishing a further understanding of the scope of majors, professional learning objectives and different from enrollment education, and improving professional identity and self-confidence"?	A. Very clear; B. Clear; C. Basically clear; D. Not very clear; E. Not clear
5. What do you think of the completion of cloud internship to "make students understand the future work situation, gain perceptual knowledge, enhance the connection between theory and practice, and prepare for academic professional courses"?	A. Very clear; B. Clear; C. Basically clear; D. Not very clear; E. Not clear

Table 2. The survey statistical results are shown in TABLE 2.

Question number	Choose A	Choose B	Choose C	Choose D	Choose E
1	38.8%	30.7%	22.5%	8%	0%
2	36.8%	38.8%	4%	16.4%	4%
3	36.7%	14.3%	36.7%	10.2%	4%
4	36.8%	38.8%	10.2%	10.2%	4%
5	38.8%	34.8%	10.2%	12.2%	4%

According to the survey results, students' teaching objectives, knowledge improvement and teaching contents of this course need to be improved. Therefore, in the future cloud practice, we should pay attention to the popularization and introduction of these aspects, so that students participating in the cloud practice can understand the learning purpose of this course, strengthen the connection between theory and practice, and better prepare for academic professional courses.

6. Analysis and Summary of Successful and Insufficient Elements of Cloud Internship

According to the analysis of successful cases of cloud internship practice, curriculum reform is a process of continuous trial and progress. Although it is a fruitful process for students, it still needs to be summarized and enriched in form and content.

6.1. Success Factors

Cloud practice is a relatively new attempt. With the help of developed intelligent equipment, we can make full use of network resources, live broadcast and video materials to better present the items we want to learn and meet the learning habits of students in the new era. The use of electronic equipment for internship is in line with some national policies in the field of education. In the guiding opinions of the State Council on actively promoting the Internet + action, traditional industries encourage the establishment of Internet thinking, actively combine with "Internet +" to explore new ways of providing education services, and encourage Internet enterprises and social education institutions to develop digital education resources according to market demand [5], so that every participating student can participate in the project, have a good learning experience, and have a deeper understanding of their own specialty, It can improve students' professional interests, establish professional concepts, establish a sense of professional responsibility, and obtain good teaching results.

6.2. Insufficient Factors

Cloud practice eliminates the connection between teachers and students and between students. From the beginning to the end of the traditional internship, the tutor will follow the whole process and eat, dress, live and travel with the students. There will be more interaction and timely communication. In life, we can timely supplement the places that students do not know, share professional knowledge, help students form correct professional concepts, and thus close the relationship between them. There are few opportunities for offline meetings and exchanges in cloud practice, and there are also deficiencies in how to effectively supervise and ensure that each student carefully watches. Cloud internship shows projection through the lens. The photographer may cause unclear shooting and jamming due to equipment, network and other reasons, affecting the beauty; Students may not be able to enter the live broadcast room due to network delay, or drop the line halfway and miss the highlights. Viewing through the lens is not intuitive. Due to the limited lens, the whole construction drawing cannot be fully displayed, which brings students a stronger sense of experience than traditional practice. Cloud cognition practice is different from traditional professional courses. Cloud practice should pay more

attention to the problems highlighted in the above questionnaires. In the process of cloud practice, if there is a lack of emphasis on professional knowledge and professional application, students cannot deepen a sense of professional identity efficiently.

6.3. Summary and Improvement

Cloud practice is in its infancy in recent years. With the powerful Internet function, it has its advantages and disadvantages. The advantage analysis is carried forward and the disadvantage analysis is supplemented. It is applied to the curriculum to promote the reform of the traditional cognitive practice to the advanced direction, so that students can have good professional knowledge and professional understanding, so that students can establish a correct understanding of the relationship between professional views and majors, so as to effectively improve the teaching effect of cognitive practice.

Cloud internship can increase offline interaction in understanding the relationship between internship teachers and students. The internship lasts about one week. After the project commentator has finished speaking, the intern teacher can organize an interactive session. The teacher will ask questions to the students and let them answer according to the knowledge explained by the live broadcast. Teachers can timely supplement the aspects not covered in the students' answers. For the question of whether students seriously watch the live broadcast, students can be urged to watch the live broadcast by opening the camera during the live broadcast, not leaving the camera during the live broadcast, and strengthening the assessment after the live broadcast.

The equipment of cloud practice live broadcast will directly affect the teaching effect. In order to solve this problem, the construction site needs to cooperate with better project commentators with camera technology to ensure that the presentation process is clear and relatively complete, so as to present the expected effect. The questions presented by the questionnaire show that the internship instructor should fully penetrate the objectives and professional requirements of the internship in the cloud internship to deepen the students' professional identity in the cloud internship and improve teaching effectiveness and learning efficiency ultimately.

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