

A Reform Process and Enlightenment of Online and Offline Hybrid Teaching of Engineering Cost Major——Taking Wuhan University of Engineering Science as an Example

Ying Huang*

College of Information Engineering, Wuhan University of Engineering Science, Wuhan, Hubei, China

*Corresponding author's e-mail:
574397925@qq.com

Abstract. In order to explore the development trend of online and offline hybrid teaching reform in the new situation of engineering cost major, this paper took the engineering cost major of Wuhan University of Engineering Science as an example, studied its teaching development process since enrollment, and then put forward some practical development strategies from the aspects of classroom positioning and teaching design.

Keywords. Engineering Cost Major; Online and Offline Hybrid Teaching; Teaching reform; Wuhan University of Engineering Science

© 2022 by The Authors. Published by Four Dimensions Publishing Group INC.
This work is open access and distributed under Creative Commons Attribution (CC BY) license (<http://creativecommons.org/licenses/by/4.0/>).

1. Introduction

The engineering cost major of Wuhan University of Engineering Science trains application-oriented students, these students could prepare investment estimates, design estimates, construction drawing budgets, and project completion accounts for construction projects, and be able to engage in project decision-making, measurement and pricing, and whole-process cost management in the entire construction process in civil engineering and related fields. Moreover the school also requires the students to systematically master the procedures and requirements for the preparation and review of project cost at different stages, be proficient in using computer-aided solutions to solve engineering cost majors and related issues, and use BIM technology for modeling and project cost management throughout the entire process, so all of these put forward higher requirements for professional teaching work. On the other hand, the current epidemic prevention situation in major cities of China is severe, colleges and universities, as key areas for epidemic prevention, must always make emergency plans for online classes. By sorting out the development process of the online teaching reform of engineering cost major in Wuhan University of Engineering Science, this paper puts forward new enlightenment on the development path of the current online and offline hybrid teaching reform of engineering cost major.

2. Teaching Reform

2.1. The initial budding period of online teaching

The engineering cost major is a comprehensive discipline. The content of teachers' teaching includes knowledge of engineering technology, economic knowledge, management and law, and students' professional cognition mainly comes from teachers' teaching. Multi-level and multi-faceted teaching is extremely important. Since the students of this major entered the school in 2017, the teacher team had tried to focus on the teaching of engineering cost major, link the actual cognitive level of students and the characteristics of the development of the times, and integrate information technology into the daily teaching process to achieve the expected result of teaching reform. At this time, the main means of teaching were as follows: firstly, actual construction videos were inserted into the multimedia courseware of the course; secondly, in terms of teaching content explanation, animation demonstrations and actual construction process videos were used for analysis; thirdly, the communication method after class was to publicize and distribute courseware in the QQ group, use group messages to answer questions, and at the same time recommend excellent online teaching videos for students to learn by themselves. This period was the embryonic period of blended teaching.

2.2. The booming period of online teaching

At the end of 2019 and the beginning of 2020, a sudden outbreak of the epidemic swept across Wuhan. Wuhan's colleges and universities were faced with unprecedented online teaching challenges. The engineering cost major of Wuhan University of Engineering Science was not spared. Under the organization and deployment, the use of various network platforms such as QQ group, Yinghua Online, Superstar Learning Pass, and Tencent Conference had greatly enriched the teaching methods and means. During the online teaching period of the 2019-2020-2 semester, teachers used Yinghua Online to realize the release of online teaching resources and final exams. The Yinghua online platform contained the basic information of all students in the school, so when teaching resources and final exams were released, it could be ensured that every student could get the resources and complete the exam normally. The Learning Pass platform developed by Superstar Learning Pass was rich in a large number of teaching resources. Teachers could upload course-related engineering materials, teaching materials, reference documents, etc., through building a class on Learning Pass. In addition, it could also make full use of the existing course resources on Learning Pass for resource sharing and optimization. At this stage, the live broadcast and recording functions of QQ group live broadcast, Tencent classroom, and Tencent conference had been fully utilized. Teachers had made full use of various teaching platforms to establish a huge micro-lecture system for engineering cost majors. Compared with the communication with students, it was only limited to QQ before. The exchange of group news had been improved to a greater extent. The 2019-2020-2 semester basically adopted the teaching method of pure online teaching. Therefore, at this stage, the teacher team completed the complete two-year overall online teaching method. The construction provided a solid foundation for the subsequent switching of online teaching methods at any time.

2.3. The Online and offline switching teaching period

With the gradual progress of the epidemic situation, the 20-21-1 semester gradually returned to offline teaching, but the online data collection and sorting of the previous semester's data continued. By September 2021, the epidemic situation was still severe, and the infection situation was repeated. Therefore, in September 2021, Wuhan University of Engineering Science launched an emergency plan, and the engineering cost major started online teaching, because of the previously accumulated online teaching. Teaching experience, the switch to online teaching had been carried out very smoothly. After the epidemic situation eased, it would be switched to offline teaching normally in October 2021. So far, an online-offline switching teaching period had been formed to cope with the changing situation. The online teaching period at this stage was not only a pure online teaching situation, but a prototype of an

online-online hybrid teaching, because a lot of preparation work had been done for the subsequent offline teaching during online teaching, and In the later stage, offline teaching still used the platform established by online teaching, and teachers can also use online teaching platforms in combination with offline teaching. For example, they could directly use Superstar Learning Pass Learning Pass to publish on-the-spot check-in and submit assignments within a limited time, which not only simplifies submission and submission The tedious process of paper homework which also urged students to complete their homework efficiently.

2.4. The mature and stable period of online and offline hybrid teaching

In February 2022, the epidemic situation changed again. The engineering cost major immediately launched the emergency plan and started a six-week online teaching. Later, because some engineering cost students were located in medium and high-risk areas, and could not return to school, so in the 7th week, the online and offline blended teaching method was adopted. The teaching method at this stage has evolved into a general online and offline blended teaching method, and the increasingly updated information technology has provided a reform direction for the teaching of engineering cost. It also provides necessary support conditions for the development of online teaching. Under the increasingly skilled online-offline hybrid teaching mode, teachers can formulate targeted teaching strategies around specific knowledge, including multimedia teaching, micro-lectures, after-class practice and other teaching forms, so as to realize theoretical knowledge and The goal of fusion of professional skills lays the foundation. The teaching and research team can also build an information-based teaching platform containing professional knowledge in the process of online and offline hybrid teaching reform, and after integrating social resources,the reform and development path are used to promote the improvement of teaching quality. In the current hybrid teaching model, offline classrooms no longer focus on the transmission of information, but instead complete interactive learning, which promotes students' knowledge internalization, skill mastery and comprehensive quality development, which can effectively deepen their learning. At the same time, teachers can decompose teaching objectives through task allocation and sharing on the teaching platform, so that the corresponding relationship between course objectives, teaching content, teaching methods and teaching environment is clearer, and each component in the teaching design is more specific and targeted. The feasibility and feasibility can be reasonably optimized for teaching design. In addition, the application of diversified teaching methods and smart teaching tools caters to students' interests and hobbies in the context of the information age, giving each student a variety of choices, and making classroom teaching "game-like" ; at the same time, through traditional teaching Check, according to the basic requirements of "cultivating people with morality", carry out advanced theory and technology teaching, focus on the cultivation of students' high-level abilities such as "criticism and reflection, application, analysis, synthesis", and then use process-based assessment and evaluation. The result-based assessment is matched with the assessment plan, which opens up new ideas for "individualized teaching" and highlights the dominant position of students in classroom teaching.

3. Development enlightenment

3.1. Selectively adopt the mixed teaching mode according to the characteristics of different courses in the talent training plan

Although online teaching has unique advantages in the transmission of knowledge and information, it also has irreparable shortcomings in the cultivation of skills and qualities, so not all courses are suitable for the introduction of online resources. Therefore, according to the nature of the course, the overall arrangement of the teaching mode can promote the realization of the goal of talent training in a reasonable and orderly manner.

3.2. The role of classroom components needs to be redefined

Teachers are no longer simply the subject of knowledge teaching, but a boosting force for in-depth learning; they have changed from the main lecturer status of traditional teaching activities to the planners, moderators, supervisors, guides and facilitators of teaching activities. Students are no longer the passive subject of information receiving, but the dominant force in classroom teaching; they need to actively think about how to apply the knowledge of online courses to the practice of solving offline problems. By internalizing information into one's own knowledge, through interactive discussion and mutual evaluation, shallow knowledge can be deepened, and through the completion of group projects, advanced skills such as "critical and reflective ability, application ability, analysis and synthesis ability" can be exercised. The teaching content is no longer limited to the transmission of information, but needs to be sublimated to the realization of the goal of talent training; the mixed teaching model can effectively expand the teaching time and space, and is richer than the traditional classroom teaching content, bringing basic knowledge transmission and comprehensive ability training into the classroom which provides opportunities that are more challenging. It is innovative and easy to add to ideological and political teaching content.^[1]

3.3. Optimize teaching design and scientifically promote the deep integration of online and offline

Online teaching inevitably leads to a surge in teaching content, and students' learning ability does not match it. Therefore, a reasonable mixed teaching design is needed as a solution. Specifically, teachers need to reasonably design the content level according to the teaching objectives, classify the learning content according to the learning requirements, and use the respective advantages of online and offline teaching to complete the learning content of information receiving (theoretical learning) and interactive communication. Learning content (practice, practice, discussion), and comprehensive deployment of teaching strategies, content connection, etc.

3.4. Reform teaching methods and effectively improve the depth of students' knowledge

In order to adapt to the deepening of higher-order thinking teaching, blended teaching must carry out "active" reforms on top of inheriting the advantages of traditional teaching methods. Organically adopt a variety of self-learning methods such as student lectures and student evaluations, practice-based lectures, case reviews, discussions and debates, etc., to promote the formation and improvement of students' abilities in communication, collaboration, inquiry, and innovation, and guide students to learn to reflect and ask questions. Complete the internalization of knowledge, and then deeply understand the difficult content of the course. In general, each type of classroom activity in the blended teaching model is the embodiment of the deep learning process with students as the main body, the reception of knowledge as the foundation, the internalization of knowledge as the process, and the transfer and application of knowledge as the result.

3.5. Based on the refinement of teaching units, fully guarantee the overall quality of blended teaching

Offline teaching can provide a good interactive environment, and the connection of knowledge points can be easily achieved through various elements, usually without deliberate design, and the teaching design can naturally be the basic unit of chapters. In order to ensure its readability, online teaching often takes "knowledge points" as a unit, and these knowledge points are relatively independent. If the teaching design idea of "chapter" as a unit is still followed, the online teaching content and offline

teaching content will be fragmented and fragmented, and it is difficult for beginners to grasp the knowledge context and key points of a course as a whole. In addition, due to the lack of interpersonal interaction in online teaching, if "chapter" is used as the teaching design unit, problems occur in the learning process of students, which is not conducive to timely correction. On the contrary, the teaching design is based on knowledge points. In each class, there are both online teaching content and offline teaching content. The connection of the mixed teaching mode becomes more learnable and can effectively save classroom hours; teachers also It is possible to obtain students' mastery in a timely manner, and flexibly adjust the teaching plan to ensure that students not only "learn" but also "learn", avoid teaching activities becoming a mere formality, and promote the improvement of teaching quality as a whole.

4. Conclusion

Under the background of the Internet + era, coupled with the current changing epidemic situation, online learning has become the general trend, and online and offline mixed teaching will also become one of the alternative modes of school education. For a course, whether to choose or not to choose, what online resources to choose, and how to deploy teaching resources cannot be generalized. It is necessary to comprehensively consider the nature of the course, resource conditions, teaching factors and other aspects, and make careful layout. For the online-offline mixed teaching mode itself, the research on its theory, method and practice still has a long way to go.

Acknowledgement

The work is supported by The sixth phase of education and teaching research project of the Northern International University Alliance "Research on the Curriculum System and Teaching Reform of Engineering Cost Major Based on BIM".

Conflicts of Interest

There is no conflict of interest.

References

- [1] ZHOU, T.F. (2022). RESEARCH ON ONLINE AND OFFLINE BLENDED TEACHING REFORM—TAKING THE ENGINEERING COST SPECIALTY AS AN EXAMPLE. *Real Estate World*, (2), 65-67.