Design of Online Teaching Plan for Mechanical Engineering Department of Shanghai Jian Qiao University

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ABSTRACT. Due to the impact of the COVID-19, the original normal classroom teaching activities could not be conducted as scheduled. To carry out online teaching in a relatively short time while ensuring the quality of teaching is a difficult task. In order to ensure the orderly and qualitative development of online teaching, ensure the quality of online teaching, the online teaching software and hardware facilities and geography of teachers and students are comprehensively evaluated. Under the guidance of the school's online curriculum policy, the department of mechanical engineering has formulated a detailed implementation and control plan for the three stages of "before class, during class and after class".

KEYWORDS: Online teaching, Epidemic prevention and control, Teaching plan

1. Introduction

At the beginning of 2020, China is facing severe challenges brought by COVID-19. The most comprehensive and strict prevention and control measures have been taken and a people's war for the prevention and control of the epidemic has started. In order to effectively stem the spread of the contagion and ensure the safety of teachers and students, meanwhile, minimize the impact of the COVID-19 on students' academic performance, the Ministry of Education decides to postpone the start of the spring semester in 2020. The original normal classroom teaching activities could not be conducted as scheduled. After postponing the reopening of schools for the new semester, the Ministry of Education launched an initiative entitled "ensuring learning undisrupted when classes are disrupted." The Ministry of Education also encourages universities and institutions to make use of the Internet and information-based education resources as much as possible to provide students with places to learn and reduce the negative impact on the normal teaching order. Therefore, online teaching quickly becomes a popular alternative for schools.

The school responded to the call of the Ministry of Education and actively carried out online teaching activities such as online teaching and online learning. At the same time, it was necessary to ensure that the quality of online learning and offline classroom teaching were substantially equivalent. It is a challenge for both teachers and students. In the past, for our department, the teaching mode is basically offline classroom teaching, moreover, most teachers are unfamiliar with online teaching. For many teachers, to be familiar with the online teaching platform and make preparation for online teaching in a short period of time are very difficult. Especially in our department, there are many older teachers who are very rusty with computer, let alone online teaching. The original face-to-face classroom teaching became a tradition in the classroom teaching process, teachers can predict the students' understanding of knowledge in time according to the changes in students' expressions, and promptly guide students with free thinking such as asking questions in a timely manner. In the classroom teaching process, because teachers and students face to face, it brings a sense of restraint and formal classroom ceremony.

While, online teaching at least has three disadvantages. The first drawback is that students cannot communicate and coordinate with the teacher in time after having class. As the teacher cannot pay attention to the changes in the expressions and eyes of the classmates, it is difficult to judge whether the students have mastered the knowledge. When the students didn't understand it, the teacher failed to find out this situation, and the students could only continue to listen to the lesson. This will not only make the students more difficult to understand the knowledge but also waste the time of learning. Another disadvantage of online teaching is that it is impossible to keep all students focused. Students, who have a relaxed atmosphere at home, are more casual and also susceptible to be disturbed. Because studying at home, family members walking around, or talking when pouring a glass of water, which may distract the classmates. What is the most, online teaching too tests the students' self-discipline ability. According to the survey of the author, only a small number of students can study independently [1]. Some students have snacks while attending class. The study efficiency is extremely low. For this type of unconscious student, it is difficult for the teacher to supervise.

Therefore, the teaching effect is difficult to present to the greatest extent. So, to carry out online teaching in a relatively short time while ensuring the quality of teaching is a difficult task.

2. Teaching Plan

In order to ensure the orderly and qualitative development of online teaching, and ensure the quality of online teaching, the online teaching software and hardware facilities of teachers and students are comprehensively evaluated. For some substantive problems of teachers and students, many teaching and research activities have been organized in our department, we finally decided to use platform courses and online live broadcast to teach online and developed a three-stage control plan for "before, during, and after class". It would be given in the following sentences in detail.

2.1 Before Class, Imparting Knowledge.

The teacher in charge of the course should watch the selected course videos, courseware, and practice questions on the platform at least one week in advance. In addition, uploading some supplementary materials according to the teaching plan and outline. Guiding students to watch the specified course video at least 3 days in advance through the communication group (WeChat / QQ / Diversion) notification, and complete the corresponding practice questions and tests on the platform. And then, 1-2 open topics for students to think about and discuss online are added. Teachers should actively check the students' questions and make records, browse and answer the questions raised by the students in the exchange area, and record common problems. At the same time, it is also necessary to monitor students' learning through the platform, send notices to students who are behind schedule, and urge them to adjust their learning attitudes and complete learning tasks. If necessary, counselor and department heads should be asked to assist and supervise students who are relatively inert. Meanwhile, the teachers should provide targeted counseling to students with particularly weak foundations. Of course, in this process, teachers need to invest a lot of time and experience to achieve the purpose of imparting knowledge. The pre-school learning framework is shown in Figure 1 as followings.
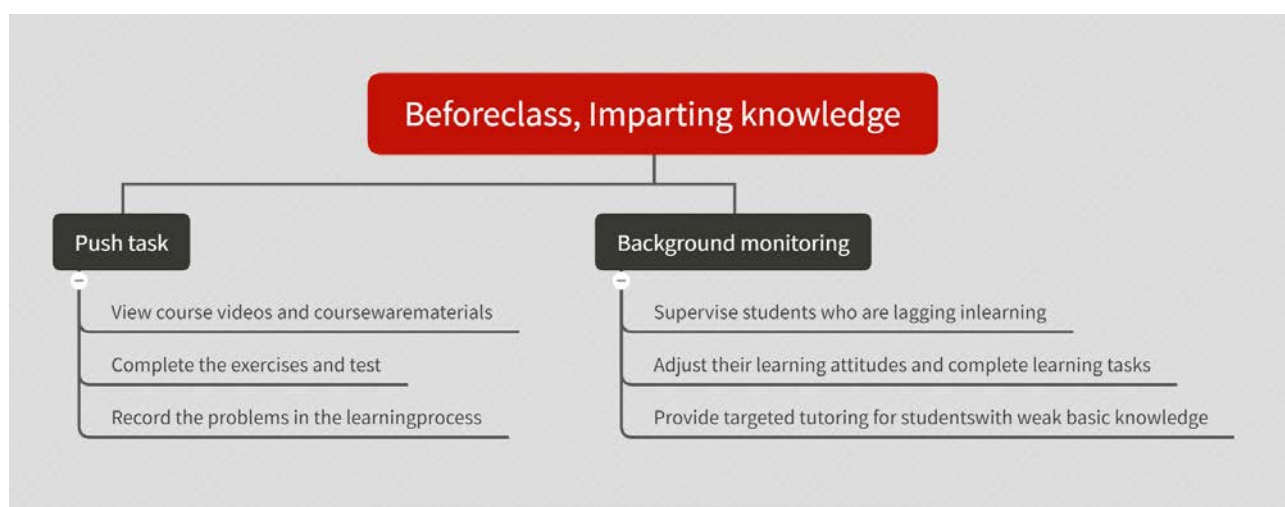

Fig.1 The Pre-School Learning Framework.

2.2 During Class, Knowledge Internalization.

It is mainly a process of knowledge internalization by fully mobilizing the enthusiasm of students. Online teaching, students are relatively free, and attention is easily divergent. Teachers should find ways to attract students to the class. To make sure every student is attending, the students should complete the check-in in the communication group (WeChat / QQ / Exchange) five minutes before the class. For the students who cannot check in on time, the class leader wakes up and signs on line one by one. During the class, first of all, the teachers concentrate on answering the common problems that students had in the early learning on the platform. Secondly, according to the specific situation of the students, explain the difficulties in the video and supplement the explanation of the students' blind spots of knowledge, and appropriately introduce the course ideology and politics. Once again, flip the class, the teacher asks questions, and the students discuss and make a speech in the group or on the platform. The teacher summarizes and guides the results of the discussion. In order to make sure that each group can have one student to speak, and those who have no time to answer the question must post the understanding of the question and the opinions to be expressed in the form of video

or audio on the platform. At last, classroom exercises should be conducted to further consolidate and deepen the knowledge points. In this process, we must give full play to the guiding role, with students as the center, problem-solving as the main line, and comprehensive quality as the purpose. And, the classroom teaching content should be carefully designed to guide students to integrate the knowledge points of online learning. The classroom learning plan is shown in Figure 2 as followings.
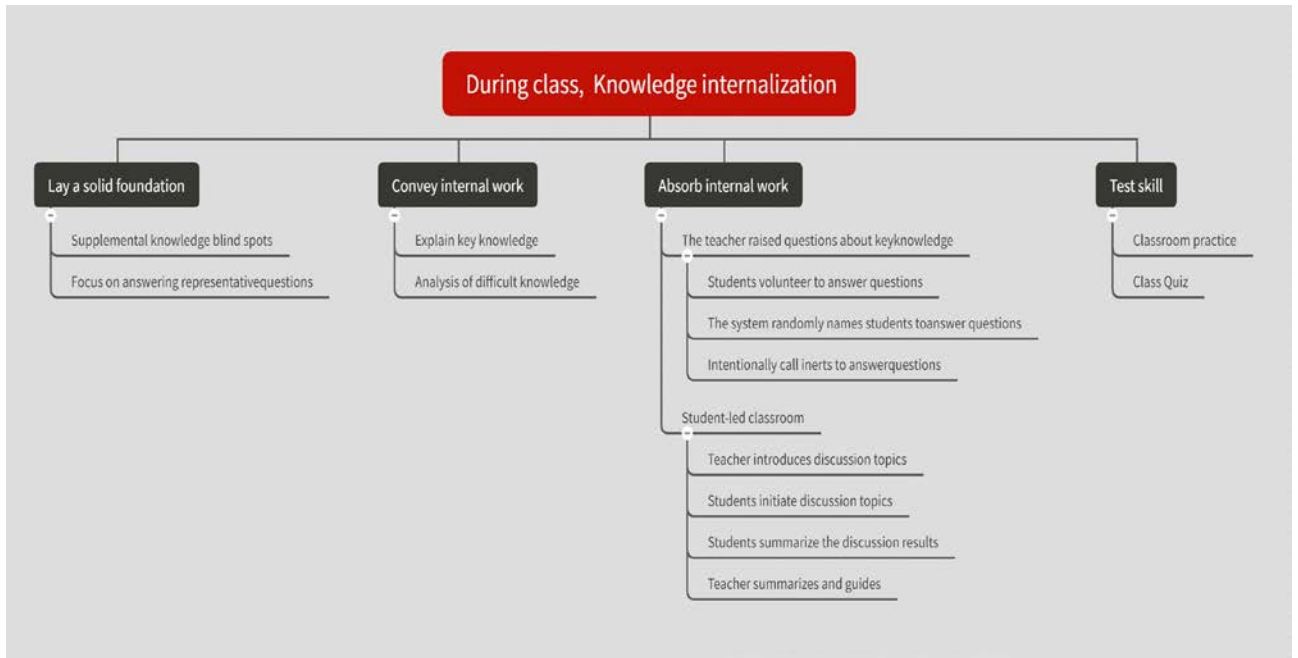

Fig.2 The Classroom Learning Plan.

2.3 After the Class, Consolidating and Strengthening Knowledge.

Firstly, Teachers should continue to do online counseling and answer questions, pay attention to teaching according to their aptitude. Especially, pay more attention to "less advanced students", and provide targeted counseling in a timely manner. Secondly, Students are often reminded to submit their assignments on time, and teachers should also make timely corrections online. The individual questions should be fed back individually. And, the common questions should be answered in class together. Secondly, the results of student homework and test scores should be released in times. Be sure to give positive feedback to students' online learning situation and answer questions in a timely manner, so that students can feel that the teacher is paying attention to them at all times. And make students are full of confidence in online learning. The after-school learning plan is shown in Figure 3 as followings.
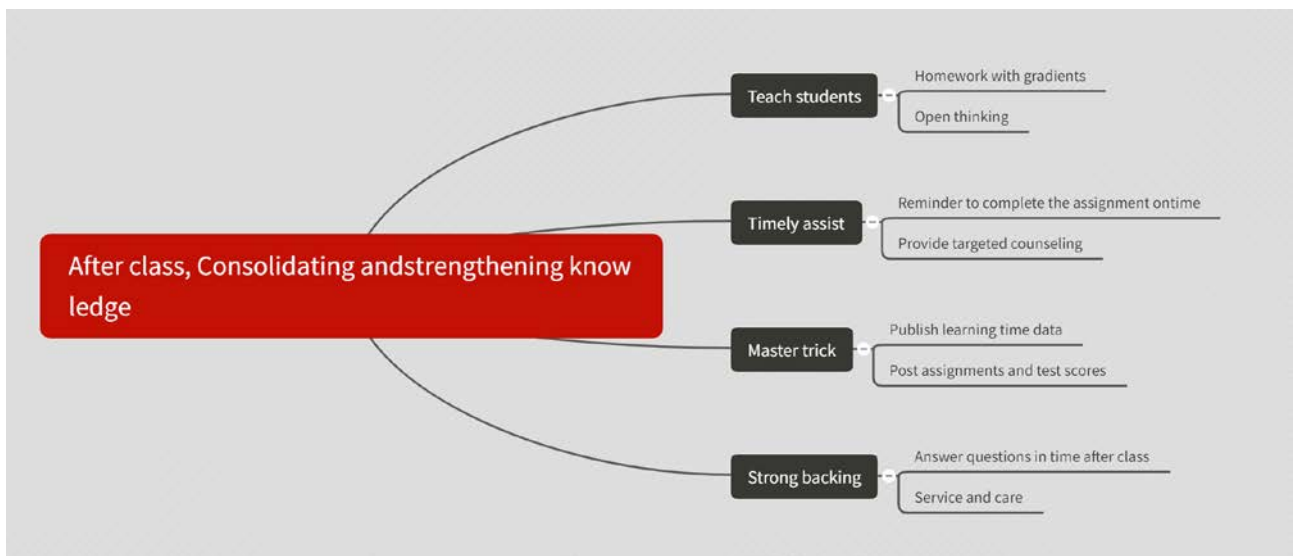
Fig.3 The after-School Learning Plan.

3. Conclusion

The plan fully considers the students' learning autonomy, uneven levels of learning and understanding, and learning environment. Through the three-stage environmental control of "before class, middle class, and after class", the online course quality resources inside and outside the school are used temperature-based teaching fully mobilizes students' subjective initiative and enthusiasm to ensure the quality of online teaching. Through six weeks of curriculum practice, good results have been achieved.

References

[1] Wang Yuwu, Wang Yuru, Li Yanxin, Li Dan. Countermeasures and suggestions for improving the quality of online education during epidemic prevention and control. China Medical Education Technology.Vol. 34, No. 02, PP. 119-124, 2020.