

A comparative study of online teaching modes in Higher Vocational Colleges based on network questionnaire survey and SPSS analysis

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Abstract—The novel coronavirus pneumonia has a great impact on the normal school teaching. The higher vocational colleges fully respond to the requirement of the Ministry of education, and carry out online teaching. This paper summarizes four online teaching modes widely used in Higher Vocational Colleges during the epidemic period, namely synchronous live teaching, asynchronous MOOC teaching, online flipped classroom and online collaborative discussion mode. In this study, "Questionnaire Star" software was used for network questionnaire survey, and SPSS 23.0 was used for data processing and analysis. This paper makes a comparative study from the aspects of teaching mode, teacher-student participation, use platform, advantages and implementation difficulties, and discusses the reform of post epidemic online teaching in higher vocational colleges.

Keywords- Online teaching; live teaching; MOOC teaching; online flipped classroom; online collaborative discussion

I. INTRODUCTION

The novel coronavirus pneumonia has a great impact on normal school teaching. In order to effectively promote the teaching work during the epidemic period, the Ministry of education has put forward the requirement of "ceasing teaching, stopping classes and not stopping learning", and the vocational colleges are actively responding to online teaching activities [1]. The Ministry of education took the lead in organizing the development of online teaching solutions. Among the 22 online teaching platforms, 1291 national excellent online open courses and 401 national virtual experimental courses were opened for free. Among them, 18 professional categories were involved in junior college and higher vocational education. Higher vocational colleges in various regions have carried out online teaching orderly and achieved certain results. However, there are some problems in online teaching, such as the congestion of network platform, the unskilled online teaching of teachers and the low enthusiasm of students in online teaching [2].

Large scale online teaching is not only a challenge for schools, teachers and students, but also an opportunity for teaching reform, teachers' professional development and students' self-development in higher vocational colleges. [3]

II. ONLINE TEACHING SURVEY

A. Survey the basic situation

In this study, teachers and students in some higher vocational colleges in Jiangsu Province are selected as the survey objects. Through the network survey, 262 effective teachers' questionnaires and 986 college students' questionnaires are obtained. Male students accounted for 43.6%, female students accounted for 56.4%. Male teachers accounted for 42.8%, female teachers accounted for 57.2%. In this study, SPSS23.0 was used for data processing, mainly using descriptive statistical analysis.

B. Survey results

Through the survey of vocational college students, it is found that 53.7% of college students agree with online teaching. In terms of learning attention, 23.2% of college students often do things unrelated to learning when they are teaching online; 1.2% and 13.4% of college students never and seldom study actively during their home time; 2.7% and 21% of college students never and seldom participate in communication during online teaching, and 8.5% and 48.6% of college students never and seldom participate in communication in online teaching, respectively And seldom communicate with teachers.

According to the survey of higher vocational teachers, 72.7% of them agree with online teaching. 5.9% and 34.6% of college teachers are very proficient in online teaching. Vocational students think that teachers' online teaching skills are not proficient in 28.3%, teachers' speaking too fast accounted for 29%, too much classroom content arrangement accounted for 31.9%, and teaching methods were not flexible accounted for 27.3%.

III. COMPARISON OF DIFFERENT ONLINE TEACHING MODES

A. Synchronous live teaching

Live teaching refers to the use of live broadcast platform, according to the course schedule, teacher's conduct online real-time teaching, and students conduct online real-time lectures at the same time. Teachers and students are only in different

space. Relying on Internet and other information technology, teaching and learning activities can achieve the same time, synchronization and progress, that is to meet the characteristics of synchronization. In synchronous live teaching, teachers and students can use live tools to communicate in various forms, such as voice, video, presentation, text discussion, etc. while teachers teach online; students can also make real-time feedback. [4]

B. Asynchronous MOOC Teaching

MOOC teaching is based on the mature MOOC course website. Teachers can choose the existing online open courses as materials, or record the video of knowledge points in advance and upload them to the platform for use. Students can select courses, watch videos and learn relevant knowledge points according to teachers' requirements. The biggest characteristic of this teaching mode is synchronism [4]. Teachers and students are separated not only in space, but also in time. Therefore, students can flexibly control their time to carry out asynchronous learning, and according to their own learning characteristics to find out the knowledge points. Asynchronous teaching can also meet the needs of communication between teachers and students, through the platform discussion, messages, questions and other forms. [5]

C. Online flipped classroom teaching

Online flipped classroom is a combination of asynchronous MOOC and live teaching, using the mixed mode of "before and after class MOOC + live in class" mode. Teachers select appropriate MOOC courses before class, and carry out online teaching activities by using live video platform according to the schedule time. Before class, let the students watch the video for self-study and complete the task before class. Therefore, the teacher does not need to explain all the teaching contents, only need to explain the key points and difficulties, and answer questions on the basis of students' interactive feedback, and organize students to conduct group discussion. [6]

D. Online collaborative Seminar Teaching

Online collaborative seminar teaching is a kind of teaching mode in which teachers set discussion topics in advance; students preview and self-study relevant learning resources, and students cooperate in groups in class to carry out online discussion. The biggest characteristic of this mode is that students construct their own knowledge system through peer discussion, innovate the methods of solving problems, and improve the ability of communication and cooperation. Teachers play a role in guiding answering questions. Online collaborative seminar teaching has higher requirements on the content of discussion, which needs to be designed according to the learning situation and teaching content, which can guide students to brainstorm. [7]

Table 1 Analysis on the participation of teachers and students in different online teaching modes and the use platform

Online teaching mode	pre class	in class	after class	learning platform
Synchronous live broadcast	Teacher: analysis of learning situation and release of tasks	Teacher: live teaching, real-time Q & A	Teacher: Publishing assignments	Tencent conference, nail live
	Student: submit the task	Students: online lectures, real-time feedback	Student: finish homework	
Asynchronous MOOC	Teacher: select course, upload and publish task	Teachers: organizing students to learn online	Teacher: Publishing assignments	MOOC/iCourse/icve
	Students: select courses and complete the tasks	Students: arrange time flexibly for study	Student: finish homework	
Online flipped classroom	Teacher: analysis of learning situation and release of tasks	Teacher: answer questions and guide	Teacher: Publishing assignments	MOOC/ Tencent classroom
	Students: watch micro class, submit tasks, self-study content	Student: online question, group discussion	Student: finish homework	
Collaborative discussion	Teacher: design discussion topic, provide resources, group	Teachers: Guidance	Teacher: effect analysis	Learning meta platform and Zhihu platform
	Student: View topics, search resources	Student: negotiation and discussion	Student: feedback	

IV. ADVANTAGES AND DIFFICULTIES OF DIFFERENT ONLINE TEACHING MODES

A. Advantages and difficulties of synchronous live broadcast teaching mode

1) Advantages

Synchronous live teaching with the help of live platform online synchronous teaching, not only has the virtual sense of online teaching, but also has the real sense of teaching; teaching situation can achieve the combination of virtual and real. Compared with asynchronous online teaching,

synchronous teaching has better interaction between teachers and students. It can not only communicate in the form of text and pictures, but also interact in real time through voice, video and other forms. Not only teachers and students can interact in real time, but also between students. Students can participate in the teaching process from many aspects. First of all, students can not only watch the teacher's live teaching, but also choose and participate in other interesting live activities. Secondly, students can ask questions in real time and teachers can answer them in real time, which also improves students' real-time participation.

2) *Difficulties*

Teachers should teach in real time, from facing students to teaching on the computer screen. Although they may not be able to see the faces of all the students attending the class, they should also give some attention, such as timely questioning, selecting students to answer questions, etc. In the process of live teaching, students' participation is not high. When teachers ask questions, students generally do not respond. Teachers should not only find problems in time, but also help students solve technical problems. Students who speak actively in class may not like answering in live teaching. Live broadcast is also the first new attempt for many students. Many students are not willing to answer by voice or video, but prefer to interact with words, which require teachers' encouragement and guidance.

B. Advantages and difficulties of asynchronous MOOC teaching mode

1) *Advantages*

There are no restrictions and no upper limit on the number of students in asynchronous MOOC courses. Students are free to choose courses that meet their own requirements. The time and place of learning are highly free. This measure also attracts many teachers and students to participate. In today's time fragmentation, this mode has brought great convenience, students' time arrangement is more flexible, and the form is more convenient. The traditional classroom teaching lasts at least 45 minutes, and each video of MOOC teaching is mostly within 10 minutes. Instead of moving the traditional 45 teaching video to the platform after shooting, the course content is subdivided into several knowledge points. From the teaching time, students' attention is more focused, not easy to get tired, and have higher learning enthusiasm. From the perspective of teaching form, students can choose to repeat learning instead of relearning for 45 minutes or even longer, which makes learning more efficient.

2) *Difficulties*

The overall design of asynchronous MOOC teaching is single, all the knowledge videos are not hierarchical and classified teaching, and the knowledge system division of higher vocational, undergraduate, graduate and social personnel is not clear. Online teachers generally lack passion and intonation. Most of them read scripts on the screen. Their teaching methods are not attractive, and they rarely get academic attention. Higher Vocational College Students' autonomous learning ability is not strong; there are also some phenomena such as watching video carelessly and plagiarizing online homework.

C. Advantages and difficulties of online flipped classroom teaching mode

1) *Advantages*

Before and after class, teachers and students can preview, review, homework and other work through the asynchronous teaching platform, and students can flexibly arrange their time to study and think; in class, teachers and students interact in real time through live broadcast platform, and synchronous learning enables students to have a stronger sense of

participation and higher degree of learning completion. The lack of interaction between teachers and students in asynchronous teaching is an important obstacle to students' learning effect. The combination of asynchronous teaching and synchronous teaching can enhance interaction to a certain extent, reduce interaction distance, and increase the frequency and quality of teacher-student interaction, which leads to more thinking, more discussion and more thinking sparks.

2) *Difficulties*

There are also some difficulties in the implementation of online flipped classroom teaching. Teachers need to design the asynchronous and synchronous phases carefully. First of all, in the asynchronous teaching stage, teachers need to carefully design teaching design and micro class, and provide students with rich and diversified learning resources and learning support. Secondly, in the synchronous teaching stage, teachers need to carefully design the answering time, discuss the topic in groups, highlight the student center, and emphasize group cooperation. Pay attention to and guide the students in the teaching process to ensure the smooth progress of online learning activities and improve the learning effect. In addition, online flipped classroom needs to use different network platforms at the same time, which has certain requirements for teachers' technical ability.

D. Advantages and difficulties of collaborative discussion teaching mode

1) *Advantages*

First of all, online collaborative discussion can not only enable the group members to carry out discussions around the collaborative learning task, but also have full interactive discussion with teachers. Teachers' real-time participation can play a role of encouragement and guidance to a certain extent, students can also maintain a higher degree of participation. Secondly, students should discuss with other group members in the process of discussion, which will involve disputes, compromises, recognition and other situations. It can also improve students' team cooperation skills and social communication ability. Collaborative discussion is not a student's work, it needs division of labor and cooperation, each member of the group should undertake the corresponding task. In order to better complete their own tasks, each student needs to make efforts to search for information and ask the teacher. To a certain extent, the possibility of fishing in troubled waters is reduced, and the students' sense of personal responsibility is significantly enhanced.

2) *Difficulties*

Teachers need to carefully design discussion topics according to students' test situation and teaching plan; secondly, students will have problems in the process of discussion, such as the deviation of research focus and unreasonable division of labor. Therefore, teachers need to pay real-time attention to the status of group discussion and give timely guidance, supervision and management. Finally, online collaborative discussion requires students to refer to relevant information before class and summarize it, which requires students' autonomous learning ability.

V. SUGGESTIONS

A. Choose online teaching mode reasonably

Teachers should choose and implement them according to the actual situation of students. For example, some students in Qinghai and Tibet have unstable network and can't stay online for a long time. Asynchronous MOOC teaching is more practical. For some students with weak foundation and poor learning autonomy, live teaching can improve learning. For students with good foundation and strong learning initiative, online flipped classroom and online collaborative discussion can stimulate students' potential.

B. Innovate online teaching mode

Online teaching mode is far more than four kinds of discussion; different modes can also be combined, such as "live + recorded broadcast" form, "live + discussion" form. For different types of courses, the applicable online teaching mode can be adjusted or integrated according to the needs. For example, professional courses can adopt the mode of "online flipped classroom + collaborative discussion", while basic courses with a wide audience can adopt The way of "large class live broadcast + small class discussion" can let more students learn famous teacher courses, pay attention to each student, stimulate students' participation, and implement hierarchical and classified teaching to improve learning effect.

C. Strengthen the construction of teaching platform and network

First of all, the teaching platform of higher vocational colleges has not achieved the unified requirements. Students use more than one teaching platform, which brings much inconvenience to the use. Secondly, some remote areas of students' home network environment is poor, network signal is unstable, network conditions are bound to be unable to meet the students' online learning. Therefore, it is suggested that the relevant departments of the state should vigorously promote the construction of the rural Internet, and take appropriate measures to support the families who have online learning needs but lack certain conditions to open the network and equip them with basic equipment such as computers.

D. Promote the innovation and reform of post epidemic teaching

First, Higher vocational colleges should formulate MOOC credit recognition system according to the actual situation, so as to meet the combination of online teaching normalization and online and offline teaching after the epidemic. Second, for teachers, large-scale online teaching is a new challenge and an opportunity for teaching research, showing the law of online education with Chinese characteristics. Higher vocational colleges should create conditions for teachers and encourage teachers to carry out relevant research on online teaching. Third, further promote the application of information technology, such as the use of cloud live broadcast, classroom answering machine and other innovative teaching, with the help of multi-screen group display to carry out discussion activities, use the monitoring system for teaching quality control, to provide support for the follow-up learning design.

VI. SUMMARY

Due to the impact of the epidemic, online teaching has once again become a focus of attention. Although there are many problems in the implementation of online teaching in higher vocational colleges, there are still many remarkable places. Online teaching is not to completely replace face-to-face teaching, but based on time, space and other objective factors, reasonably choose online teaching mode, and further promote the deep integration of information technology and curriculum teaching. The fundamental purpose is to improve course teaching and improve students' learning effect.

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REFERENCES

- [1] Ministry of education. The Ministry of education novel coronavirus infection leading group office should guide the organization and management of online teaching in ordinary colleges and universities during the epidemic prevention and control period. [OL]. <http://www.gov.cn/zhengce/zhengceku/2020-02/05/content_5474733.htm>
- [2] Zheng Q; Qin T; Shen Q, (2020)Implementation status, problems and Countermeasures of online teaching during the epidemic. Audio visual education in China, 05
- [3] Shen H; Hao D; Jiang J. (2020)Thinking on online teaching practice and post epidemic online teaching reform during the period of "class suspension without suspension" -- Taking Shanghai Jiaotong University as an example. Modern education technology,05
- [4] Jiang Z; Zhao C; Li H, (2017)Influencing factors of online learners' satisfaction: comparison of live and recorded situations. Open education research,04.
- [5] Li W. (2018)Comparative study on three common mixed teaching modes under the background of MOOC. Modern educational technology, S1.
- [6] Wan K; Zheng X; Ren Y.(2020)Are you ready for large-scale online learning? ——Thinking on online learning and intelligent technology application in post epidemic period [J]. Journal of distance education .03.
- [7] Li H, Wang W. (2019)Online collaborative learning in 5g era: characteristics and models. Audio visual education in China. 09.