

## Development of Online Flipped Blended Teaching Mode in Higher Vocational Education during COVID-19 outbreak: A Case Study

Lin Liu  
Guangdong AIB College  
College of computer  
Guangzhou, China  
lliu@gdaib.edu.cn

Kai Liu  
Hunan Normal University  
School of Marxism  
Changsha, China  
liukai8684@163.com

Jianbao Zhao  
Guangdong AIB College  
College of computer  
Guangzhou, China  
jbjzhao@gdaib.edu.cn

*Abstract—With Covid-19 spreading, in order to respond to the Ministry of Education's deployment of "suspended classes without suspension of learning", Teachers in higher vocational colleges is also actively developing online teaching. In this paper, the Blended teaching mode of "online and offline integration" is optimized and adjusted and developed an effective online Flipped Blended mode based on SPOC. Taking the course of "digital video production" as an example, the Blended teaching mode of "Tencent classroom + vocational education cloud + QQ group" is used to achieve real-time and efficient teaching results.*

**Keywords—COVID-19, Online blended teaching mode, Flipped classroom, SPOC, Development, Case study**

### I. INTRODUCTION

To meet the needs of covid-19 epidemic prevention and control, the Ministry of Education issued the call of "using the network platform to suspended classes without suspension of learning, without suspension of learning" on January 29th[1]. Colleges and universities across the country have overcome difficulties to start online teaching. However, there are many problems in online teaching, such as teachers being the anchor, online class platform failure, teaching video jams and so on. In addition to the problems of technical conditions, how to carry out online teaching to achieve online teaching and offline classroom homogeneous equivalence and provide students with great online learning experience is an urgent problem for teachers to solve. As a new teaching form, blended teaching can give full play to the advantages of online learning, make full use of teaching resources, enrich teaching approaches and improve teaching effect. Aiming at the practical problems of online teaching in higher vocational colleges, this study actively explores an effective online blended teaching mode by using the combination of online live broadcast, SPOC and instant message tools.

### II. BLENDED ONLINE TEACHING BASED ON ONLINE FLIPPED CLASSROOM

#### A. Blended online teaching

The application and development of Blended Teaching in Colleges and universities have a long history, which has become an important way to promote curriculum reform, improve teaching quality and promote personnel training in Colleges and universities [2]. Under the background of "Internet plus education", the continuous development of blended teaching emphasizes the deep mixing of various elements and the maximum effectiveness [3]. During the epidemic period, because only online teaching is available, the blended teaching mode of "online and offline integration" must be optimized and adjusted to give full play to the advantages of blended online learning, make full use of teaching resources, enrich teaching approaches and improve teaching effect.

#### B. Online flipped classroom

The flipped classroom refers to a teaching mode in which teachers make videos, students watch videos at home or after class to learn knowledge, and teachers and students communicate face to face and solve problems in the classroom [4].

The essence of an online flipped classroom is the same as face to face flipped classroom. The basic process is divided into three stages: "before class, in class and after class", which reshapes the position and role of teachers and students in the teaching process. The difference between online and face to face flipped classroom mainly lies in the implementation of interactive parts. The online flipped classroom is online and completed with the support of live classrooms, cloud platforms and instant-messaging tools.

#### C. SPOC

SPOC (Small Private Online Course: Private broadcast course, i.e. small-scale restricted online course. [5]) is a new course construction and application mode in the post MOOC era. SPOC is a more refined, smaller and more flexible online open course type than MOOC. It not only

integrates the advantages of MOOC, but also makes up for the shortcomings of traditional classroom teaching. Because of the obvious advantages of blended learning, especially its flexibility, ease of operation, and the combination of multimedia and science and technology, SPOC is widely welcomed[6].

#### D. Live broadcasting platform

Since 2016, live broadcast technology has been rising in the field of Internet applications. From the initial competition live broadcast, game live broadcast, sports and entertainment live broadcast to the later national live broadcast, live broadcast technology has gradually penetrated all aspects of human learning, life and work. In the past, online classroom and video teaching based on video recording and broadcasting have some defects, such as self-talk, boring content, lack of interactivity, etc., which make it difficult to

maintain learners' attention. Compared with this, a live classroom can more flexibly make up for the lack of online learning interaction. The combination of live broadcast technology and online education has created an online education model. Ni Junjie and others analyzed the advantages of live classroom from the aspects of immediacy, interactivity, sense of ceremony, fairness and mixture. Real-time interaction is the primary feature of a live classroom. Teachers can interact with students in real-time through pictures, words and voice, understand students' ideas and dynamics, and give feedback in time. At present, the mainstream online live platforms in China include Tencent Classroom, Ding Talk, CC-talk, UMOU, Rain Classroom, China University MOOC, etc.

#### E. Instant messenger

Instant messaging software provides a convenient platform for teachers and students to answer questions accurately and communicate with each other. At present, the mainstream instant messaging software in China includes QQ, WeChat and Ding Talk.

### III. A MODEL FOR BLENDED ONLINE TEACHING BASED ON FLIPPED CLASSROOM

#### A. The mainstream way of online teaching

According to our school's office of online teaching for teachers to use the teaching platform, Tencent classroom, Zoom in the top two, the proportion of 74.29%, 42.91% respectively.

Teachers make full use of MOOC, Tencent courses, Tencent conferences, QQ, WeChat, ZOOM and other teaching platforms and tools, make full use of the characteristics and advantages of each platform, and actively explore online hybrid teaching. Such as "SPOC + live + instant tool discussion", "MOOC + MOOC class", "Tencent class + Instant messaging software

communication", "video + flipped class" and "offline self-study+ live report communication", etc.

#### B. A model for blended online teaching based on flipped classroom

On the basis of learning the excellent experience of "online and offline blended teaching mode", this study analyzes the characteristics of online live broadcast, online learning platform and instant messaging software, as well as the difficulties faced by online teaching during the epidemic period, and comprehensively considers the course objectives, teachers, students, teaching content, process, methods, environmental resources, etc. Factors, the online flipped blended teaching mode based on SPOC is constructed. (refer to Figure 1)

##### 1) Reconstruction of curriculum system from teaching concept to teaching method

Teachers need to consider the characteristics of online teaching and students' acceptance, follow students' learning rules, redesign and consider the course content and method, consider the appropriate simplification of teaching content, send some memory content as background information to students for pre-class preview, strengthen the interaction and communication between teachers and students in class, mobilize students' learning enthusiasm, etc., so as to improve students' learning input and Study enthusiasm, and then improve students' study effect. It is necessary to further implement the concept of student-centered, guide students to gradually adapt to the change of learning mode and focus on cultivating students' independent learning ability.

##### 2) Enhance interactive communication and master students' learning state

Be familiar with the use function of online platforms, give full play to the advantages of online teaching, enhance real-time interaction with students, timely understand the learning effect of students and problems encountered in the learning process through assignments, tests and other ways, and provide personalized solutions to problems.

##### 3) Give students effective tasks

Online teaching is different from face-to-face teaching, which requires more offline time support to achieve better results. The design of preview and review requirements closely related to the course content can improve the learning effect of students. It is recommended that the course design the relevant materials and preview requirements for students before the course according to the characteristics, test or inspect the preview knowledge points in the course, and set up related to the course content Through the effective design, we can combine the activities after class with the course teaching.

##### 4) Pay attention to ability training and realize diversified teaching objectives

Moderately improve the degree of challenge and openness of the course, pay attention to the cultivation of

students' consciousness and ability of independent learning, as well as higher-level abilities such as criticism, exploration, expression and cooperation, and strengthen the consciousness of "Course Ideological and political" to guide students' values.

#### IV. METHODOLOGY:A CASE STUDY

In this study, taking " digital video production " course as an example, using Tencent classroom as a live tool, vocational education cloud platform as a teaching resource, QQ as an instant messaging tool, the online flipped classroom SPOC hybrid teaching is carried out to explore the teaching ideas and teaching methods under the epidemic situation. The specific implementation process is shown in the figure 2.

##### A. Teacher's asynchronous guidance before class

Teachers record the pre-class micro-video, upload the self-study task list using the vocational education cloud platform, and push the pre-class activities such as pre-class quiz to students. According to the actual situation, students can watch the teaching video by themselves, check the task list for independent learning, preliminarily grasp the course knowledge points, and complete the pre-class quiz. Teachers use the cloud platform of vocational education to make statistics of students' learning situations, such as pre-class quiz and courseware activities, so as to grasp the real-time dynamic of students' learning, grasp students' learning progress, and ensure students master course knowledge points.

##### B. Teacher's simultaneous assistance in class

Tencent classroom (teacher's fast Edition) supports screen sharing, PPT playing and video playing, allowing students to raise their hands to speak, answer cards, one-click export of attendance data, and containing information such as student viewing time. At the same time, the live video supports unlimited playback and download, which is convenient for students to review at any time. Teachers use Tencent classroom for direct teaching. First, summarize the learning situation, introduce the course content, carry out project-based teaching, and cooperate with students in groups to complete the learning task. Teachers use Tencent classroom real-time sign-in, real-time Q & A, voice communication, group PK, interactive discussion and other functions to help teachers understand students' real-time dynamics, promote classroom participation, activate classroom atmosphere, and improve students' attention.

##### C. Teacher's asynchronous assistance after class

Teachers use the cloud platform of vocational education to release homework, check students' homework, and feedback and evaluate students' works. Teachers use QQ communication software to establish the QQ group, so as to release course information, network

discussion and interactive Q & A, A in time. In addition, teachers can use group announcements and group calendars to ensure that students receive important reminders; group space capacity is 10g and learning materials can be stored for free for a long time. Students use QQ online class group for problem feedback, discussion, and exchange. After class stage of the vocational education cloud platform includes after class arrangement, questionnaire survey, courseware sharing, homework submission, arrangement stage examination, student evaluation, etc.

#### V. DATA COLLECTION AND ANALYSIS

In order to test the application effect of the online hybrid teaching mode, this study analyzes the effect of online hybrid learning from the aspects of students' comprehensive learning ability (problem-solving ability, collaborative learning ability and autonomous learning ability) and learning attitude. 135 copies of "online flipped hybrid teaching application effect questionnaire" were distributed to the students of three online teaching classes of 2018 digital media application technology major who taught the course of digital audio-visual production this semester, with a recovery rate of 100% and an effective questionnaire of 129, with an effective rate of 95.6%. The results of the questionnaire were statistically analyzed, and the fi value was calculated according to the scoring rate formula.

##### A. Problem solving ability

The average score fi of students' online flipped blended learning is 0.86, greater than 0.5, and the scoring rate is greater than 0.5, indicating that students' problem-solving ability is relatively strong.

##### B. Collaborative learning ability

In terms of collaborative learning ability, the average score of Fi is 0.84, which is greater than 0.5, indicating that most students' collaborative learning ability has improved.

##### C. Autonomous learning ability

It can be seen that the average value of the score rate fi of students in terms of autonomous learning ability is 0.83, greater than 0.5. And the scoring rate of each item is greater than 0.5. It shows that most of the students have improved their autonomous learning ability through online learning.

##### D. Learning attitude

In terms of learning attitude, the average score of Fi is 0.79, which means that most students have improved their learning attitude.

##### E. Learning outcome

From the students' final works, the quality of students' works has been greatly improved. Compared with last

year's face-to-face course, the average score of students increased from 88.5 last year to 92.

In conclusion, the online flipped blended teaching mode adopted in this course during the epidemic can improve the online learning effect of students, improve their autonomous learning ability and problem-solving ability, and improve their interest in learning.

## VI. DISCUSSION

### A. *The teachers and students of online learning are completely separated, and the sense of experience is not strong*

Online flipped hybrid teaching, both before and after class is online learning. In online classrooms, teachers and students are completely separated, there is no real-time classroom atmosphere, online learners can't see the real situation of the classroom, interaction deepening is not present, and the sense of experience is not strong, which will produce an untrue feeling. How to solve the online classroom presence through technical means is the trend of future research?

### B. *The challenge of teachers' online mixed teaching ability*

Students change from passive recipients to active selectors and evaluators. Teachers are not good at guiding students on the spot, cannot see the expression of students, cannot grasp and determine the state of students at the other end of the network, and have a feeling of talking to themselves. How to arouse the students' interest in online learning, how to arouse the enthusiasm of group learning, how to explain the key and difficult points through the network direct platform, etc. Once again, live teaching brings teachers back to the core of online education, reflecting the role of teachers in guiding and regulating the classroom. Students' persistence and participation in the live classroom mainly depend on Teachers' teaching ability and style characteristics, which puts forward higher requirements for teachers' teaching and interaction ability. Therefore, online hybrid teaching ability is a new challenge for teachers.

### C. *Personalized learning service needs to be strengthened*

Live online classes are popular with young people. After class, the online live broadcast platform will automatically generate playback, and learners can continue to review the classroom, review knowledge, and strengthen learning effect according to the key and difficult points in the course after class. Classroom videos can also be shared with other universities and social learners to promote resource sharing and education equity.

However, how to use the network platform to meet the learning needs of different learning groups, provide personalized learning support services, and promote students' in-depth learning needs to be strengthened.

## VII. CONCLUSION

With the help of Tencent live classroom, vocational education cloud platform and QQ group, we can reasonably design the learning process and optimize the integration of resources. Through the implementation of online flipped blended teaching model in the three stages of "digital video production", the results show that it can promote the independent learning, problem-solving and collaborative learning ability of college students, meet the diversity and personalized needs of students, and stimulate learning Students' interest in learning can improve teaching efficiency. In the future, the development of online blended teaching technology will be expected to further innovate the blended teaching mode in higher vocational colleges, provide an effective reference for teaching reform and innovative practice, and provide more opportunities for talent training and teaching reform in Colleges and Universities.

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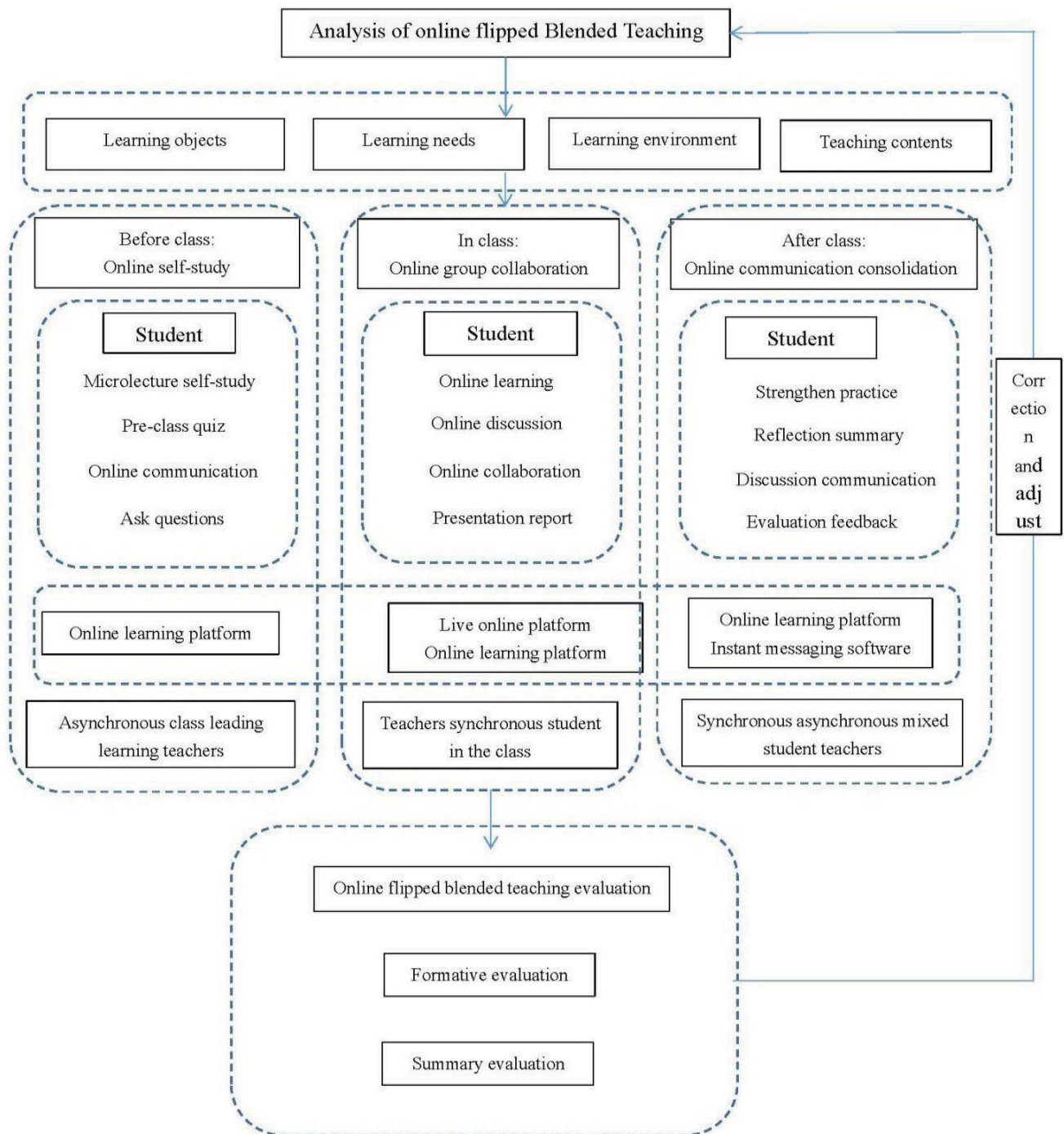


Figure 1. The online flipped blended teaching mode based on SPOC

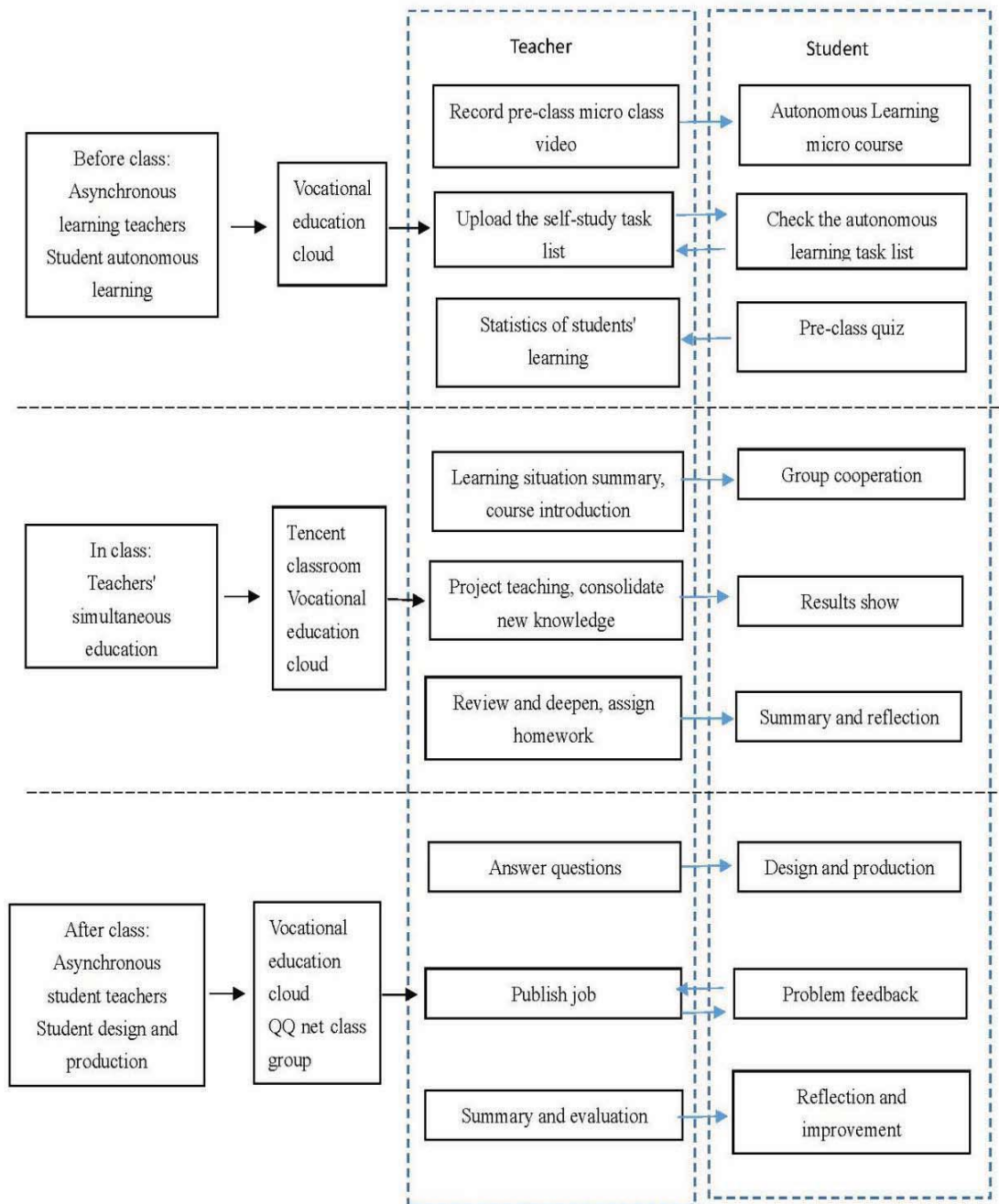


Figure 2. The specific implementation process of "digital video production"