Research on the Design and Practice of Online and Offline Blended Teaching Based on the Concept of Flipped Classroom

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Abstract—**Against the background of adult higher education with diversified levels of students, the blended teaching model based on flipped classroom effectively combines the essential advantages of online independent learning and offline classroom face-to-face teaching. Before class, teacher can use curriculum learning platform to release learning plans and resources, and students can carry out online independent learning and group discussions; in class, teacher can design inspiration-based teaching activity to help students internalizing relevant knowledge, realize blended teaching and cultivate students' independent thinking ability and good learning habit. This blended teaching model is conducive to solving the problems such as the outstanding contradiction between working and learning in adult higher education, and positively promotes the reform of teaching in adult universities.**

Keywords: flipped classroom, blended teaching, online and offline blended model

I. INTRODUCTION

The rapid development of information-based education has brought impacts and challenges to the teaching model and environment of higher education. In March 2015, the Ministry of Education clearly stated in the "Key Point of Information-based Education in 2015" that it is necessary to persist in promoting the deep integration of information technology and education and teaching. At present, many adult colleges and universities have carried out blended teaching reform based on online course platform, and some professional courses are gradually changing from traditional face-to-face classroom teaching to blended teaching. How to make use of a large number of high-quality online open course resources to implement online and offline blended teaching and achieve the teaching effect is a realistic issue faced by adult education.

Flipped classroom is a new type of teaching organization emerged in recent years, takes students as the center and makes students become the main body of the classroom. It is also an effective way to achieve blended teaching. Constructing a blended teaching model based on flipped classroom is an effective means to achieve the goal of information-based education, cultivate students' comprehensive competencies and innovative ability, and solve the contradiction between working and learning of adult students. It is also an urgent issue for open education today.

II. CONNOTATION OF BLENDED TEACHING AND FLIPPED CLASSROOM

Blended learning is a new method of teaching and learning that combines traditional face-to-face classroom learning with teacher and online digital learning. Blended teaching is proposed on the basis of blended learning theory. The so-called blended teaching (Blended learning) refers to a teaching model that blends multiple teaching theories, teaching methods, teaching resources, and learning evaluations, and focuses on the combination of advantages of traditional classroom teaching (Face-to-Face-Learning) and online teaching (Online-learning). It not only emphasizes embodying students' dominant role, but also emphasizes the leading role of teachers in guiding, enlightening and monitoring students' learning.

The Flipped Classroom Model is also called "inverted classroom". Here flipping means that the processes of teaching and learning are flipped over. This teaching model can be defined as a new teaching model in which teachers use information technology (the support) and education technology to make teaching videos as learning resources before class, and release the course teaching schedule to students online before class, including watching and reading videos and documents involving relevant knowledge points, complete knowledge tests and group collaborative learning assignments online, use the online learning platform of a course to answer questions of students who learn independently at any time, and give face-to-face classes to mainly develop topic discussions and reporting communications and interactive Q & A activities. This teaching model has realized the reversal of knowledge transmission and knowledge internalization in space and time.

Through flipped classroom, students can grasp the learning content and speed by themselves; students are active

learners rather than simple absorbers of knowledge; the construction and internalization of the knowledge system takes place in classroom. In the flipped classroom model, teacher's functional positioning has undergone a great change from a simple passer of knowledge to a leader and organizer of classroom teaching activities. Teacher can use games, experiments, group discussions, forums and the like diversified activities to help students in internalizing their knowledge and deepening their creativity, inquiry ability, and teamwork spirit.

The concept of flipped classroom runs through the blended teaching, moves the independent learning of knowledge to the outside of face-to-face classroom, and puts the internalization of knowledge, discussion and communication, and problem solving inside face-to-face classroom. This way can not only make full use of the concept of integrated online and offline teaching based on blended teaching but also promote diversified learning methods for students, and explore new ideas for teaching reform of adult higher education with prominent contradictions between working and learning.

Since Shanghai Open University established the "open + platform + system" new university construction goal in 2012, totally 5 batches of construction (totally more than 500 online courses) and practice has been conducted to make all-round attempt and exploration on blended teaching and a relatively stable and mature model has been formed. Relying on the practice of education reform in the system of Shanghai Open University for many years, it is proposed to construct a blended teaching model based on flipped classroom and starting from micro-lectures. Taking the "Corporate Internal Control Practice" as an example, this paper designs the flow of blended teaching model based on flipped classroom, and puts forward suggestions for effective implementation of this model, with the hope to provide some reference for promoting the teaching reform of relevant courses.

III. AN ANALYSIS OF THE STATUS OF ONLINE AND OFFLINE BLENDED TEACHING BASED ON THE CONCEPT OF FLIPPED CLASSROOM: TAKING THE "CORPORATE INTERNAL CONTROL PRACTICE" AS AN EXAMPLE

The "Corporate Internal Control Practice" is a compulsory professional course for undergraduate majoring in financial management at Shanghai Open University. This course is also a new course of the newly-open financial management (internal control direction) against the new university construction background of "open + platform + system". The course teaching is carried out in a project-led and task-driven manner, and is divided into three basic teaching parts: knowledge reserve, knowledge transformation, and ability demonstration. Teacher can guide students to do pre-class knowledge reserve work through project-led and targeted independent learning resource platform to cultivate students' knowledge transformation and application ability.

A. Teachers' preparation for teaching resources before class

In order to construct blended teaching model based on flipped classroom and starting from micro-lecture, the first is to know about and analyze the learning base of students and the difficulty of teaching content, then design and develop a scenario learning resource supporting many learning manner based on the teaching goals and targeted to a knowledge point or teaching part. The course has now been produced into a relatively complete online learning resource library, including micro-lecture teaching videos recorded by teacher based on more than 30 knowledge points, micro-lecture animation videos produced on the basis of more than 20 knowledge points, nearly 20 cases and multimedia animation video libraries, course exercise library, practice item library, virtual laboratory, etc.

The above learning resources have been developed and produced in 2018 and released on the learning platform of Shanghai Open University. Those teaching resources have the characteristics of shorter teaching time, less teaching content but prominent topics, smaller resource capacity, and convenience for mobile learning. But in use, it is found that the click-through rate of some learning resources is not high; students have not that high positivity in independent learning by watching micro-lectures, and the quality of online assignments actively completed by students is not ideal; students' independent learning before class is not implemented in place so that the effect of face-to-face classroom is not good.

B. Students' online learning

Students can learn about the teaching schedule and content through the online and offline integrated teaching plan released by the teacher, make clear the task requirements for independent learning, complete the pre-class learning tasks by watching and learning relevant micro-videos, PPT materials, and test assignments on the learning platform, upload the knowledge points that cannot be understood in this stage to the group collaborative learning discussion area of the learning platform to discuss with other students of the group, and the teacher will collectively answer some common questions. This stage is mainly to let students know the overall status of the learning tasks and schedule of the course, and encourage students to complete the learning tasks at their own study time schedule. However, after two semesters of trial operation, it is found that due to problems of adult students such as the contradictions between their working and learning and their different cognition level and learning foundation, few students can complete the independent learning task as per the pre-class learning schedule, the learning effect under teacher's supervision is not good, teacher and students have little interaction online, and there is also lack of individualized learning guide. The cases all impact students' learning effect of the course.

C. Flipped classroom

In flipped classroom, teacher serving as the leader for effective implementation of teaching activities leads students to organize group discussions, demonstrate their outstanding learning results, answer questions, explain difficult points, and do other knowledge internalization activities. For example, when teaching internal control processes in various business parts of an enterprise, the nodes, text, lines and other expression methods of internal risk control chart are complicated for reason that some businesses are intrinsically complicated, involve many departments and approval procedures and face many risks; they are not suitable to be explained in micro-lecture in detail; but in face-to-face classroom, they can be collectively explained and it is also available to practice students' level of manually drawing the risk control chart. However, students' pre-class independent learning effect is not good enough, they fail to well master the connotation of relevant knowledge points before class, and the face-to-face classroom attendance rate is low, so that the implementation of discussion-based teaching activities is restricted, the enthusiasm in showing group collaboration learning results is not high and the achievement of the teaching reform goal is impacted.

D. Evaluation and training after class

The training of this course requires students to go deep into their company or a company they are familiar with to know about the basic status of the company's internal control, the control process flow of each main business part, the key control points and control measures, as well as find out the problems in the company's internal control and give suggestions for improvement based on what they have learned. However in practice, students are not that willing to go deep into their company to know about the actual status related; most students' practice reports are the internal control status of a listed company; most of the reports are copied, with little innovation; their thinking ability and creativity are both to be further improved.

IV. DESIGN OF ONLINE AND OFFLINE BLENDED TEACHING MODEL BASED ON THE CONCEPT OF FLIPPED CLASSROOM

Taking the modular course "Corporate Internal Control Practice" of financial management major of Shanghai Open University as an example, this paper makes a teaching design in pre-class learning resource design and production, students' online independent learning activities, flipped classroom teaching activities and learning supervision and evaluation in combination with the concept of flipped classroom and blended teaching model. The design of the blended teaching model is as shown in "Fig. 1".
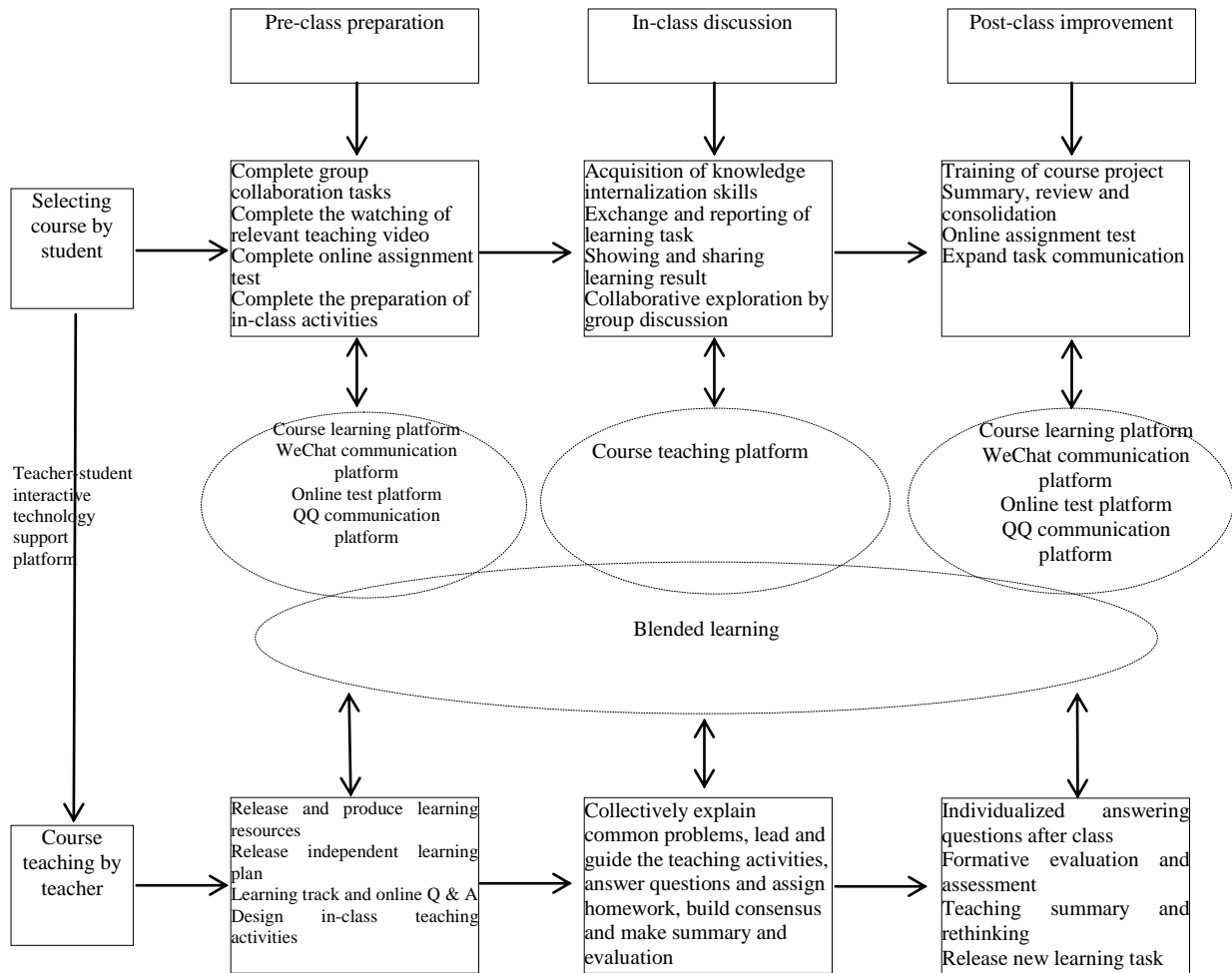
Fig. 1. Design of blended teaching model based on flipped classroom.

A. *Design and production of pre-class learning resources*

1) Segmentation of knowledge points

Segmentation of knowledge points is the basis for a series of tasks such as production of teachers' actual recording videos, animation videos, and teaching case. When producing and designing the resources, the learning content of the chapters of the course is divided into more than 50 small knowledge points based on the characteristics of online learning, course and learners. The small knowledge point is regarded as the production unit of micro-videos; meanwhile when recording and producing videos, it is needed to consider the logic relation between the knowledge points and the completeness.

2) Production of teaching videos

According to the teaching objectives and requirements of the course, and in order to increase the visibility and fun of the video and reflecting the principle and characteristics of teaching according to their aptitude, the video production is divided into two categories, namely, the teacher's actual recording video and animation video. Each video is short and powerful, with duration less than 10 min. This way can effectively improve students' learning focus.

3) Design of virtual laboratory and online scoring assignment

According to the internal control process and key control points of an enterprise and in order to reflect the characteristics of contextualized teaching, an online virtual laboratory is designed to increase learners' perceptual cognition and interest in learning. The design purpose of the online scoring assignment is to check learners' independent learning effect by testing the basic concepts and basic theories in each chapter, and to help learners consolidate their knowledge learned.

4) Design of learning tasks before class

By designing and releasing pre-class learning tasks, teacher can give learners clear learning requirements and goals. At the same time, it is necessary to consider the degree of difficulty, so that learners can convert learning pressure into learning motivation. The school's online learning platform can be used to regularly release such assignment and implement effective supervision on it.

B. Design of students' online independent learning activities

Students must first get familiar with the resources on the online learning platform. Before class, they can use mobile phones, computers and other tools to watch micro-lecture videos and browse learning resources online according to the requirements of learning tasks. They can complete the pre-class learning plan through online independent learning. Any problem encountered can be solved by searching the Internet, looking for reference books, and asking teachers or classmates for help. If encountering very difficult common problems, learns can release a collaborative discussion in the online learning group or communicate with teacher. Teacher can also regularly track and evaluate the learning progress and effects of learners on the learning platform, analyze, and get to know the learners' independent learning status based on data analysis on the learning platform, and design targeted flipped classroom teaching activities.

C. Design of flipped classroom face-to-face teaching activities

Before the face-to-face teaching, the teacher can first analyze the learning process data of the learners on the learning platform, analyze the learning platform data to understand the learner's independent learning situation, and explain the difficult, key and doubtful issues in detail. In this way, teacher can teach in face of students having sufficient knowledge reserve and the classroom efficiency is greatly improved. Effective organization of teaching activities is a very important content of blended teaching. In organizing group discussions, teacher should pay attention to the dominant role of students and guide students to participate in discussions spontaneously. If the question is not answered satisfactorily, teacher can collectively answer the common problems. Finally, each group can show the exchange learning results in classroom, teacher can guide students to conduct self-evaluation in the group, mutual evaluation between the study groups, and eventually the teacher makes a summary comment. If there are unfinished or continuing discussions, a discussion area can be set up in the learning platform to further discuss it after class.

The results of group discussions in the classroom can also be uploaded to the learning platform for students in the same group to continue the discussion or review. In addition, in order to consolidate the learning results in the classroom, teacher should assign online homework or test according to the progress of the classroom and student's learning situation. Students can also communicate with the teacher online at any time through the learning platform. This way can make the course teaching change from "teaching orientation" to "problem solving orientation".

D. Design of learning supervision and evaluation

Learning supervision and evaluation is one of the important guarantees to ensure effective development of blended teaching. The effective implementation of blended teaching based on flipped classroom should have certain requirement for students' online learning time to ensure

students' independent learning effect and facilitate the subsequent implementation of teaching activities in flipped classroom. Therefore, it is necessary to take a supervision and assessment approach to urge students to study to ensure the steady improvement of teaching quality. The assessment of blended teaching course generally adopts multiple evaluation methods. The online assessment of this course accounts for 50%, and the main methods include investigating the number of times students click the platform learning resources (5%), the duration of watching the video (10%), the number of times posting message for group discussion on the platform (5%), completion quality of online assignment and test (10%), group training results display and exchange (10%), and speaking in the classroom group discussion (10%). The offline final exam accounts for 50%. Among them, the evaluation focuses on the combination of teacher evaluation and group mutual evaluation, so as to allow students to have more opportunities to show themselves and further promote and ensure that the learning activities are fun and orderly.

V. RETHINKING OF EFFECTIVE PRACTICE OF ONLINE AND OFFLINE BLENDED TEACHING BASED ON THE CONCEPT OF FLIPPED CLASSROOM AND THE SUGGESTIONS

A. Institutional guarantee at the school level

At present, the practice of blended teaching model based on flipped classroom is still in its initial stage in many colleges and universities.

College teachers and students do not have a complete understanding and experience of the construction and implementation of this teaching model, and do not yet have a deep understanding of the concepts and roles of "teaching" and "learning" in flipped classroom. The flipping model will inevitably lead to a substantial reduction in class hours of face-to-face teaching. The time for teaching design and production and online personalized coaching will increase significantly. However, the workload of teachers only takes into account the class hours of face-to-face teaching, so that the income of teachers participating in teaching reform is decreasing but working hours are being extended. In view of this situation, relevant implementation rules have not yet been issued at the school level, thereby diluting teachers' initiative to make innovation in blended teaching. Therefore, in order to make teachers continuously have a high degree of enthusiasm for the research of information technology teaching reform in the new era, school should also formulate corresponding incentive strategies, form an effective incentive mechanism, actively do a good job in technical support services for the learning platform, and form a concentrated effort teaching reform atmosphere in the campus to ensure that the overall teaching reform can achieve real results.

B. Changing the role and improving the ability of teacher

The blended teaching model based on the concept of flipped classroom puts forward high-level and diverse requirements for the comprehensive improvement of

teachers' teaching ability and comprehensive competencies. First, teachers' teaching concepts need to be changed. Compared with traditional classroom, the flipped classroom is a place where teacher and students learn together, communicate with each other, and internalize knowledge. Teacher needs to carefully design and produce various teaching videos and text teaching resources as required to complete the teaching before class, as well as a clear and detailed independent learning plan. In the flipped classroom, more time is given to students for reporting, displaying, and discussion, and the teacher becomes a class organizer and guide. The pre-class teaching preparation will be more complicated and tedious than the "lecture preparation" under the traditional teaching model. Teacher needs to fragment the course knowledge and redesign the knowledge structure of the chapters. Those require teacher to have strong teaching design ability, and spend a lot of time in producing teaching resources (multimedia courseware, teaching videos, etc.), and use rest time to invest in the process of interacting with students and answering questions. Therefore, teacher needs to pay attention to the learning dynamics and progress of each student at any time, which all enlarge the workload of teacher and prolong the working time compared with traditional teaching. To ensure good teaching quality, teacher needs to have higher enthusiasm for work and persistent professionalism.

Secondly, teachers' teaching ability should be strengthened. Implementing blended teaching requires teacher to be proficient in using various teaching aids. Teacher should design and record micro-lecture videos, make statistical analysis on the use of teaching resources, WeChat public account operation and maintenance, learning supervision and evaluation system construction, etc. These teaching tasks all require teacher to master certain education information technology in order to successfully carry out effective teaching activity. At the same time, teacher is also required to get used to using flexible and interesting teaching methods to motivate students' positivity to participate in learning discussion. This teaching mode may also be challenged and doubted by peers and students at the early stage of the teaching reform. So, teacher also needs to have good communication and coordination skills and systematically learn a variety of new education and teaching theories, information technology, teaching and research skills, and so on to ensure that the blended teaching reform can be carried out effectively and achieve practical results.

C. Improving students' subjective initiative in independent learning

Students are the main body of learning. In this teaching model, they are no longer passive receivers of knowledge. They need to change from "I'm required to learn" in the traditional teaching model to "I want to learn". Learning is a highly individualized process. What one learns and to what extent one learns are to be implemented by individuals. Others cannot replace it. So, the individual's learning desire and initiative are the primary factors affecting the learning effects. Blended learning is mainly independent learning. The learning rhythm is controlled by the learner him/herself.

Only by maintaining a positive learning attitude and subjective initiative, and choosing a learning method that is more suitable for the learner can he/she achieve good learning results. This requires students to change from the habit of passive learning in the past, overcome their inertia, and choose a suitable learning method based on their characteristics; only after having the spirit of active learning can a "emulate, learn from, catch up with, help and in turn surpass each other" communication atmosphere be created among classmates. In the process of group collaborative learning, the collision of thinking, expression and understanding manners will also promote mutual learning, and further achieve the purpose of common improvement, thereby stimulating students' inherent initiative and potential.

Changing the way of learning is not easy. At present, the foundations of students in adult colleges are uneven; it is difficult for some students to adapt to the flipped classroom teaching model both in learning attitude and learning ability. Therefore, it is necessary to evaluate the effect of the blended teaching model based on the characteristics of the course and the characteristics of the students, in order to think about and measure which professional courses and classes are suitable for adopting the blended classroom teaching model. The teaching reform pilot should generally be conducted in a class with a small number students who have good foundation, so that teacher can have more time to provide one-to-one personalized guidance, better meet the diverse and personalized learning needs of students, and truly reflect the teaching concept of "teaching students according to their aptitude".

VI. Conclusion

Blended teaching based on flipped classroom breaks the traditional teaching mode mainly based on classroom teaching, clarifies student's dominant position in the learning process, and promotes the improvement of students' independent learning ability and learning motivation which further changes into constant learning willingness in turn. This way is conducive to improving students' ability of innovation and independent thinking. The students are changed from the "audience" who passively receive knowledge under the podium into active participants in teaching. Each student can independently arrange his/her learning time and manner on the basis of their learning foundation and self-study ability, which is more conducive to the multi-level personalized learning of adult students, embodies the "learning-centered" educational philosophy, and cultivates students' independent thinking ability and good learning habit. This way truly realizes the sharing concept and application value of open online course and is also an effective approach to education and teaching reform in the context of adult education with diverse students.

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