

Mixed Teaching Mode for Online and Offline under COVID-19 Epidemic Situation

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Abstract: This paper carried out a study on the teaching mode of mixed line and offline under the background of post epidemic. The outbreak of New Coronavirus has hit the whole education industry like flood. In order to fight this battle of education, schools at all levels have been actively creating "war time" classes in the air. The purpose is to deeply integrate information technology and education and teaching, build a new effective hybrid teaching model focusing on online live broadcasting and cooperating with other online and offline learning activities, and ensure "online and offline, equal quality and efficiency". Therefore, summarizing and analyzing the prominent problems exposed by online education under the background of the epidemic and putting forward online and offline education integration measures are of great significance for giving play to the boosting role of online education and improving the quality of education in the information society in the post epidemic era.

Keywords: Online teaching; Teaching mode; Mixed teaching

1. Introduction

Under the background of the normalization of the epidemic, it has had a great impact on the teaching work of colleges and universities. Offline classrooms are no longer the only learning place for students, and teachers' teaching methods are challenged. Colleges and universities have adopted the online teaching mode, which is not only a test of the teaching management ability of colleges and universities, but also a test of the achievements of the early course construction, but also an experiment to widely promote the reform of intelligent teaching. How to effectively use information design, mix online and offline teaching mode and gradually improve the teaching mode of colleges and universities is the goal of this paper. Therefore, summarizing and analyzing the prominent problems exposed by online education under the background of the epidemic and putting forward online and offline education integration measures are of great significance for giving play to the boosting role of online education and improving the quality of education in the information society in the post epidemic era.

2. Current Situation Analysis

The model of online teaching and distance education originated in the United States. In 2001, MIT launched the "open courseware" program to provide free and high-quality learning services for scholars all over the world, opening a precedent for open education resources. In April 2003, the Ministry of Education issued the notice of the Ministry of education on starting the construction of excellent courses in the teaching quality and teaching reform project of colleges and universities, officially launched the "National Excellent Course Construction Project", and opened the prelude to the co construction and sharing of open education resources in China's higher education. In 2012, the emergence of large-scale open online courses (mo courses for short) further developed and improved the mode of open courses and online teaching^[1]. In the context of the normalization of the epidemic, online teaching models have been opened one after another, and some problems have been found in the process.

2.1. Insufficient Ideological Preparation for Online Teaching

During the epidemic, schools were forced to conduct online teaching, and all courses could only be taught online. Many teachers do not have enough time to adapt to this sudden change. Some teachers

lack experience in online teaching, and even older teachers will not use relevant system software to teach. Different from the traditional offline classroom, teachers can't face each student directly, supervise students' every move at any time, and can't get the feedback of teaching content in real time, which makes the work efficiency of online teaching low. Pure online teaching has changed in terms of learning environment, teacher-student relationship, organizational structure and management mode. We can't copy the teaching design of offline teaching courses [2].

2.2. Students Lack a Good and Suitable Learning Environment

One of the basic conditions for online teaching is that students have a suitable learning environment at home. "Environment" not only refers to the conditions such as network and related equipment, but also includes whether there is a quiet environment, positive learning status and necessary process supervision. Online teaching is almost always in the form of online teaching. Teachers can't supervise whether you are listening carefully in real time, whether you are completing relevant homework and studying independently, which has become unknown. Students studying online at home is not only a test of students' consciousness and independence. More test the degree of control of the learning process. Some students with weak consciousness may be distracted, even hang up online classes to play games, completely neglect their studies, which will lead to a rapid decline in the effect of learning.

2.3. The Online Teaching of Practical Courses Is Difficult

In the process of online teaching, students can listen to classes, answer questions, hand in homework and other activities on the grid, which has no great impact on some disciplines with relatively strong theoretical requirements, but there will be many problems for some disciplines with strong practical requirements, such as experiment, operation and observation. Therefore, students in pure online education can only learn theoretical knowledge in limitations, and lack of relevant activities and practice, so students can not really learn the essence of the discipline and explore their knowledge in depth, and it is difficult to sublimate from practice.

2.4. Lack of Effective Interaction and Communication between Teachers and Students

In the specific environment of the school, face-to-face communication between teachers and students is a teaching mode familiar to China for many years. It can hand over cultural knowledge, ideas and labor skills to students, so that students can learn not only rigid knowledge points, but dynamic and multifaceted quality and ability development. However, in the case of online teaching, the communication in front of the network appears stiff and pale. There is a lack of interaction and emotional communication between teachers and students in the course, and there is no more effective discussion after class. The teaching process of the course is full of boring PPT and knowledge points, which can lead to students' low learning efficiency and limited humanistic growth.

2.5. Limited online Learning Conditions and Insufficient Resources

In addition to having a good environment, students need some hard configuration when learning online at home. If there is no Internet at home, and even some families can't afford mobile phones and computers, such as no network or slow network speed in rural and remote poor areas, students can't meet the basic requirements of online teaching, and online learning will lose its significance. In addition, some of today's webcast platforms are not perfect, and it is easy to cause jams when teachers teach, which will affect the continuity of the classroom^[3]. The imperfect functional resources of the webcast platform will also affect the effect of teachers' class, such as the inconvenience of blackboard writing, the inconvenience of students' reflecting problems, etc.

3. Research on Mixed Teaching Mode

With the effective control of China's COVID-19 and the gradual restoration of teaching activities under the school's line, it is urgent to further improve the guarantee system and operation mechanism of online education and teaching resources, give full play to the enthusiasm of teachers in carrying out education and teaching with information technology, and promote the teaching mode combining online with offline. The mixed teaching mode mainly includes: mode 1, the mode of instructor + tutor, which is completely taught by tutors in online class, and offline by tutors in one-to-one tutoring and Q & A; In

mode 2, some courses are completed by students' self-study and teachers' online teaching, and the rest are completed by teachers' centralized face-to-face instruction in the classroom; In mode 3, some students teach face-to-face in class, and some students in weak areas learn online and synchronously^[4].

3.1. Establish a Correct Concept of Education

To improve the quality and level of online teaching, the first is the upgrading of teaching mode and school form. At the same time, it needs the transformation of the concepts of teachers, students and parents^[5]. The first is the concept of comprehensive education. "Class suspension without school suspension" does not only refer to the goal of non class suspension through online teaching, but a broad sense of learning. "Class suspension without school suspension" refers not only to online teaching, but also to home learning. Teachers should have the best big lesson of reality. The second is the students' central view. The so-called "no suspension of classes" is the most important thing for students to "learn". If the traditional classroom is still dominated by teachers' "teaching", then online teaching must be dominated by students' "learning". Teachers should focus on the students' position in the differentiated home environment and firmly establish the idea of learning by students and teaching by learning^[6].

3.2. Strengthen the Construction of Digital Resources and Optimize the Network Platform

In the environment of epidemic crisis, the most valuable resource for large-scale online education is an available and effective online learning platform to ensure the availability and security of the platform, the sufficient preparation of online learning hardware facilities, and the absence of other external interference or equipment failure during online learning, It is the most basic requirement for schools to carry out online education^[7]. Colleges and universities should establish and improve relevant network core computer room, wired network, wireless network, virtualization system and other network facilities, and conduct integrated design and transformation of wired and wireless networks in combination with emerging network interconnection, 5g technology, Internet of things, cloud computing and other technologies, so as to ensure effective network basic conditions for teachers and students to carry out online education. Online teaching platform should also take measures to appropriately optimize the construction and design of the platform, add functions that can assist teachers in managing the classroom, and improve the timeliness of communication.

3.3. Innovating Teaching Mode to Improve Quality and Efficiency

In order to ensure that the teaching standards and quality are not reduced, the construction of intelligent teaching service system is not only the innovation point of building first-class undergraduate education in local colleges and universities, but also the key point of comprehensively improving talent training ability. Through the in-depth integration of information technology (live broadcast, Tencent conference, wechat, etc.) and education and teaching, a new effective hybrid teaching mode focusing on online live broadcast and cooperating with other online and offline learning activities is constructed to realize the integration and migration from "offline classroom" to "online classroom": release learning tasks before class (mark key and difficult points) - students' self-study - online live teaching (video, audio, animation and text are integrated for real-time recording and broadcasting) - exercise evaluation - after class Q & A - unit evaluation - questionnaire survey - teachers and students exchange teaching experience - adjust the teaching scheme. Cooperate with the application of the four dimensions of intelligent teaching environment, intelligent teaching mode, intelligent teaching evaluation and intelligent teaching management to make the development of online teaching more perfect.

3.4. Flipping Teaching Subverts the Traditional Teaching Structure

Different from the traditional teaching methods, the online + offline teaching mode is to transfer knowledge through teaching videos and online discussions, and transfer the decision-making power of learning from teachers to students, so that students can focus more on active learning, so as to obtain a deeper understanding in learning. Everything is learner centered, "learning" is the core, and "teaching" is only a means to assist "learning" Train students to think rather than listen to class. The most important behavior of students from beginning to end is thinking, thinking independently before class, and thinking with their peers with the help of teachers in class; Focus on before class, not after class. Learning and thinking before class is the key, not the strengthening and consolidation after class. There

is no need for more corresponding strengthening learning behaviors after class (such as homework, review, examination, etc.) to ensure the effect of classroom teaching; Integrate multiple learning behaviors. Integrate multiple learning behaviors such as memory, understanding, thinking and application. In the traditional classroom, the mode of learning in class and reviewing after class separates the behavior of receiving knowledge, interpreting knowledge, thinking knowledge and applying knowledge. The integration of multiple learning behaviors is more conducive to the learning and mastery of knowledge.

3.5. Enhance online and Offline Interaction and Reflect Humanistic Care

Online teaching lacks certain real-time monitoring and timely interaction. The traditional teaching style of teachers or the guidance style of students can not effectively achieve the teaching effect. Then, it is particularly important to consider the personalized needs of students. We can make different teaching plans according to students with great differences in personality or learning styles, and take into account the learning efficiency and feelings of different students while teaching. Discussion, answer and Q & A are interspersed in the classroom to increase classroom interaction and interest. On the other hand, in addition to class time, teachers can also communicate with students through wechat and other communication software to help students answer questions and solve doubts, alleviate students' negative emotions, enhance the feelings between teachers and students and show humanistic care.

3.6. Cultivate and Improve Teachers' Information Literacy

The sudden epidemic has accelerated the reform of teaching mode. People realize that the cultivation and improvement of information literacy is the inevitable trend of teachers' professional development in the future. On the one hand, managers should pay attention to the development and utilization of educational information resources and emphasize technological innovation, so as to promote the innovation of mechanism, establish an intelligent and personalized teaching service system, and ensure the provision of rich information resources and services for teachers and students. On the other hand, teachers should actively cultivate information awareness, recognize the importance and inevitability of informatization and their own information literacy in today's teaching, so as to improve the application ability of modern educational technology, make full use of the information resource platform to intellectualize information and promote the optimization of educational resources.

4. Curriculum Design of Mixed Teaching Mode

With the rapid development of the information age, hybrid teaching has developed into a new teaching model in Colleges and universities. Compared with the single traditional classroom and online learning, the mixed teaching mode can integrate the advantages of online communication and face-to-face interaction, realize the perfect combination of receptive learning and discovery learning, and is conducive to the cultivation of students' autonomous learning and cooperative learning ability. According to the process, hybrid teaching can be divided into three stages: before class, in class and after class. The design process is as follows^[8].

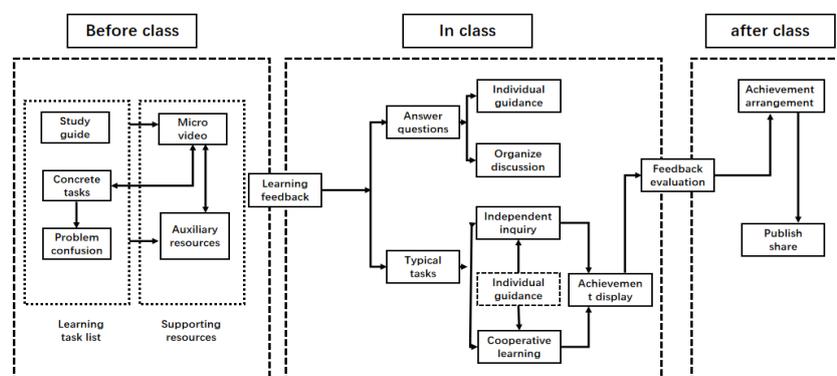


Figure 1: Mixed teaching flow chart

First, online autonomous learning before class. Teachers release learning tasks to the platform,

while students conduct autonomous learning through relevant curriculum resources on the e-learning platform, such as video resources and other auxiliary resources. At the same time, they submit doubts and opinions generated in the process of autonomous learning to the e-learning platform, so as to obtain information feedback on learning before class, Facilitate the smooth development of follow-up teaching work. The second is offline teaching in the class. This stage can be divided into three links: question answering, typical tasks, communication and achievement display. Teachers solve common problems through unified explanation or group discussion according to the feedback obtained from autonomous learning, and give individual guidance for some personalized problems. In the typical task link, teachers set typical inquiry problems in combination with the curriculum requirements and syllabus, and select appropriate teaching activities to effectively solve them according to different inquiry problems. When the research activity is successfully completed, it will enter the achievement display and exchange link. Students will display the research learning achievements in the form of display report and work display to share learning experiences and experiences. In this process, teachers need to comment on their learning achievements, encourage students to evaluate each other, and guide students to do well in reflection and self-evaluation. The third is the consolidation and reflection after class. Based on the evaluation and suggestions of teachers and peers in class, students modify and improve their learning achievements and upload them to the online learning platform for communication and sharing, so as to build a campus learning environment.

According to each stage of mixed teaching, the learning activities are designed from the perspective of environment, teachers and students, and the mixed teaching model is obtained.

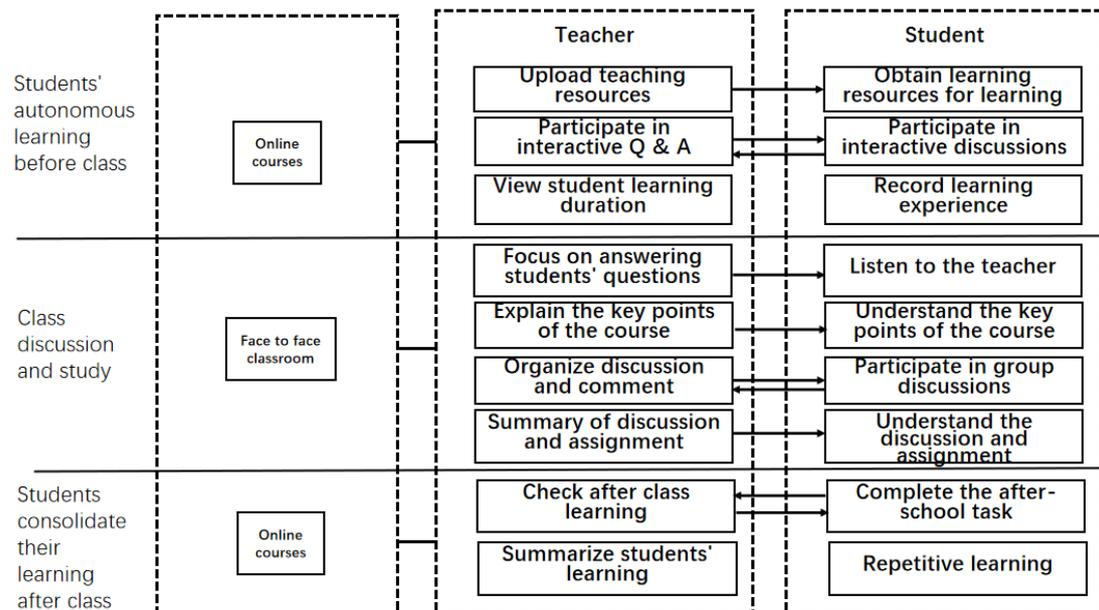


Figure 2: Hybrid Teaching Model

4.1. Pre Class Autonomous Learning Stage

Pre class autonomous learning is carried out independently on the network learning platform. At this stage, teachers upload course requirements, learning tasks and prepared course resources, such as recorded micro courses, PPT and extended reading materials, to the learning platform according to the syllabus, so as to facilitate students to better realize autonomous learning. At the same time, the information discussion in the group can also help to grasp the current learning performance of students, do a good job in interactive communication for the problems raised by students, and deepen students' understanding and mastery of knowledge. In addition, through the analysis of students' learning time, resource browsing and other relevant information, grasp the existing learning progress in order to carry out the next teaching. Students enter the e-learning platform, refer to the learning tasks and requirements, get learning resources from the platform to complete the autonomous learning work, publish the puzzles or learning experiences encountered in the learning process on the learning platform, communicate and discuss with teachers and peers through replies or private chat, and record their experiences.

4.2. Discussion and Learning Stage in Class

Students' discussion learning is carried out in the classroom opposite below the line. This stage includes four links. First, teachers need to solve the common problems reflected by students during autonomous learning in the form of centralized explanation or group discussion, give one-to-one guidance to some students' individualized problems, and students listen to the guidance of teachers. Secondly, according to the exchange and feedback on the students' pre class learning platform and in combination with the syllabus, teachers teach the key and difficult parts of the course to help students deepen their knowledge understanding. Then, under the condition of grasping the key and difficult points, arrange students to conduct in-depth exploration, communication and speech, comment on students' speeches, and guide students to actively participate in discussion and speech. Then, the teacher analyzes and summarizes the students' discussion and speech, and arranges the homework according to the students' learning situation. At this stage, teachers should do a good job of guidance, organize students to think actively, express their opinions and participate in discussions, so as to help students digest knowledge smoothly.

4.3. Consolidation Learning Stage after Class

After class, students consolidate their learning stage mainly through the network learning platform. After the teacher publishes the after-school homework to the learning platform, the students complete the corresponding homework by consulting materials and retrieving relevant cases, and submit it to the learning platform. Teachers judge students' current knowledge mastery level by marking homework and provide feedback for students. Students reflect on themselves in combination with teachers' feedback, and repeatedly learn and consolidate the knowledge points they do not master.

5. Evaluation of Mixed Teaching Mode

5.1. Evaluation Model

Table 1: Evaluation index table

Evaluation node	Primary index	Secondary index	Evaluation subject
Before class	motivation	Video viewing duration	teacher
		Resource views	
	process	Number of questions	
		Q & A times	
In class	motivation	Check work attendance	teacher
	process	Panel discussion	
		Group interaction	
		Questions	
	effect	Answer questions	teacher and student
		Learning Report	
After class	motivation	Group achievement display	teacher
		Number of assignments handed in	
	process	Participation times of homework mutual evaluation	teacher and student
		Brainstorm	
		Usual operation	
	effect	Final results	teacher
		Job completion quality	
		Results not tested in the current period	

Based on the analysis of the evaluation characteristics of mixed online and offline teaching process, and combined with the theories and indicators related to process evaluation, we get the process evaluation model of "integration of learning and evaluation" based on mixed teaching. "Integration of learning and evaluation" means that evaluation runs through learning activities. Based on learning effect, corresponding diagnostic evaluation, formative evaluation and summative evaluation are carried out in three stages before, during and after class. Refer to table 1 evaluation index table^[9]. Evaluation requires teachers and students to participate in multi-dimensional evaluation and play the role of evaluation in promoting students' learning and development. "Integration of learning and evaluation" is

an evaluation to promote learning effectiveness. The core is to pay attention to and promote students' learning, and emphasize the process of teachers and students collecting evidence to determine the gap between students' learning degree and learning objectives and achieve learning objectives. The evaluation model is mainly composed of three modules: mixed teaching process, process evaluation and students' personal learning portfolio. The evaluation of this model continuously circulates learning and evaluation along the process of mixed teaching, and uses the learning portfolio to completely record students' learning behavior and achievements. During the period, process evaluation is a means to help teachers and students make timely adjustments and changes to the learning process and improve learning efficiency.

5.1.1. Hybrid Teaching Process

The mixed teaching process consists of three stages: before class, in class and after class. Combined with the relevant evaluation indicators, according to the nature of pre class online e-learning, pre class learning is divided into three activities: autonomous learning, interactive Q & A and online testing; According to the key contents of classroom teaching, learning in class is divided into three activities: group cooperation, communication and interaction, and report and display; According to the purposeful characteristics of after-school learning, after-school learning is divided into three activities: homework, multi-agent evaluation and final test. This module is not only the entrance to collect students' mixed learning behavior, but also the basis of process evaluation of students' learning.

5.1.2. Process Evaluation

Integrate the evaluation process into each stage of mixed teaching, realize systematic evaluation and analysis according to students' learning objectives, effects and participation, and strive to achieve the organic combination of learning and evaluation. The purpose of process evaluation is not only to pay attention to the students' final achievements, but also to pay attention to the students' motivation, pay and investment, progress and so on in the whole learning process^[10]. The designated evaluation index system dynamically evaluates the whole mixed learning process of students from three aspects: Students' motivation, process participation and effect. Combined with the evaluation results, some incentive methods are appropriately used to make the evaluation activities and learning process a way for students to show their achievements and progress, so as to encourage students to actively participate in learning and evaluation.

5.1.3. Student Personal Learning Portfolio

Students' personal learning portfolio is mainly based on the mixed teaching process module, the process of students participating in mixed learning activities, recording the learning behavior of the whole process in detail, and storing and collecting the learning results. Among them, the records of learning behavior need to be placed in various subtle performances during the learning period, such as the number of resources browsed, the number of discussions participated, the number of works participated in the evaluation of others, the punctuality of homework submission, etc. at the same time, it also includes behavior data records reflecting students' communication and interaction, group cooperation and reporting and display in the classroom. The storage of learning achievements stores and records students' learning achievements in the form of students uploading homework, works and participating in tests, so that students can query and reflect.

5.2. Evaluation Mechanism

5.2.1. Teachers as the Guide and Students as the Main Body

The essence of adhering to learning is that students realize the significance of knowledge independently. During this period, we need to pay attention to the exertion of students' own subjectivity, and teachers play an auxiliary and guiding role. Process evaluation emphasizes the perfect combination of evaluation and students' learning process. Therefore, the process evaluation under the mixed mode should take teachers as the guide and students as the main body. By supervising students' learning process, teachers collect and analyze the dynamic situation of students' learning process, clarify students' learning motivation, state and effect in combination with the analysis results, reflect, adjust and optimize teaching strategies, respect students' personalized differences, and provide targeted guidance and intervention for students; Through multi-agent mutual evaluation and feedback information, help students objectively view their strengths and weaknesses, and enable students to realize the benign development of divergent thinking under the influence of continuous thinking collision, so as to promote students' common progress.

5.2.2. Multiple Evaluation Subjects

The evaluation subject is diversified. Teachers are not the unique subject of evaluation. We need to make more people participate in the evaluation, especially make the evaluated students become the evaluation subject, and develop diversified evaluation models such as teachers' comments, students' self-evaluation and mutual evaluation. Among them, students' self-evaluation, that is, students' evaluation of their own learning behavior and achievements, can not only help students improve their individual cognitive ability, but also guide students to actively adjust their follow-up learning strategies and attitudes, so as to give play to the guidance and return function of evaluation; Peer evaluation focuses on mutual learning and reference, so that students can learn from the advantages of peers and refer to their suggestions, so as to stimulate students' learning motivation. At the same time, peer evaluation requires students to give evaluation and suggestions on their peers' learning, which is conducive to the development and cultivation of students' communication ability and cooperation ability; Teacher evaluation mainly plays the diagnostic function of evaluation. Through teacher evaluation, it evaluates the current learning situation of students, excavates students' strengths, and defines the problems faced during learning, so as to provide personalized guidance to students. During this period, teachers can also judge and analyze the shortcomings of their own teaching links, so as to optimize the teaching process, Improve teaching efficiency and realize the optimization and perfection of teaching quality and teaching effect.

5.2.3. The Evaluation Results Truly Reflect the Learning Effect of Students

The research makes it clear that learning is a continuous and dynamic process. It is difficult for a simple final test to fully show the dynamics of learning, and the smooth progress of process evaluation can systematically evaluate and analyze the whole process of students' learning, which is more scientific and rational. Before class, teachers can make a preliminary judgment on students' learning degree and learning style by recording students' learning behavior such as video viewing time, Q & A and summary test, so as to formulate teaching strategies; In class, teachers learn about the development of students' thinking mode, cooperation and innovation ability through information records such as students' classroom performance and achievement report; After class, teachers can understand students' knowledge mastery, knowledge transfer ability, thinking ability and emotional attitude through students' homework quality, mutual evaluation, brainstorming and participation in practical activities. Through the whole process evaluation of students before, during and after class, the learning results are fully displayed, and the overall evaluation results are more authentic and reasonable, which is conducive to promoting students' all-round development and progress, and has a good application prospect and promotion value in the current educational work.

6. Conclusions

The epidemic is a touchstone to test the modernization level of China's higher education governance. It is urgent for colleges and universities to improve the lack of online education, timely take online and offline education integration measures and improve information literacy. The hybrid online and offline teaching mode can be upgraded to integrated teaching, and the online and offline in-school and out of school in-class and out of class integrated teaching, (1) the online and offline realize organic integration, which can be switched at any time, and the teaching mode needs to be redesigned; (2) There must be no fewer students on and off campus. (3) Integrate different teaching scenes, different teachers' teaching habits and different teaching software. For individual students who cannot come to class or joint training classes across provinces and cities, integrated teaching brings a good opportunity. Individual students can interact online and offline through Tencent meetings. Online teaching increases the openness and transparency of the course, adjusts the teaching design and interaction methods, promotes teaching reform and tips, and integrates each individual of the course into an organic whole. So as to promote the process of educational technology reform and realize the teaching revolution as soon as possible.

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