

Problems and countermeasures of online teaching in the post-epidemic era

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Abstract. The outbreak of the COVID-19 epidemic has accelerated the transition of offline teaching to online teaching at colleges and universities in China which are speeding up the construction of information and intelligent education. Offline teaching is conducive to constructing a new type of education and talent training paradigm in the intelligent era. Through literature review and investigations, it is found that in the post-epidemic era, online teaching still has some problems, such as insufficient information technology guarantee, insufficient interaction between teachers and students, single teaching effect evaluation indicators and students' poor self-discipline. To cope with the above-mentioned challenges, this paper has proposed the following suggestions for online teaching in the post-epidemic era: increase investment in information infrastructure, improve teachers' information literacy and online teaching ability in an all-round way, update and improve the academic evaluation system and enhance students' independent learning ability. All those suggestions aim to promote online teaching and create a new model of college education.

1 Introduction

The development of multimedia, cloud computing, Internet and computer science has expanded the scope of education, and the development of cutting-edge technologies such as 5G communication technology, big data and artificial intelligence has provided new thoughts and means for the in-depth integration of information technology with education. On the one hand, the development of information technology is constantly promoting teaching reform and innovating teaching theories in practice. On the other hand, researches into education theories are constantly deepening people's understanding of information technology, which in turn promotes the application of information technology in teaching. [1] The sudden outbreak of COVID-19 epidemic in early 2020 has broken the normal teaching order of all schools in the world and posed great challenges to higher education worldwide. With the continuous spread of the virus, online teaching has become a "regular" method of teaching. During the COVID-19 pandemic, colleges and universities in China actively implement online teaching and has achieved the goal of "uninterrupted teaching" in all regions and at all levels. According to statistics of the Ministry of Education, in 2020, a total of 1.08 million teachers at Chinese colleges and universities delivered 1.1 million

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courses (17.19 million classes), with a total of 3.5 billion college student participation and 91% online course rate, which was unprecedented in both scale and scope. [2] Online teaching, which is also called e-learning, is a kind of education with the help of modern information technology such as the Internet, multimedia and AI. Through network technologies, teachers and students can carry out online teaching and learning activities, and with the help of online learning resources, students can learn at anytime and anywhere. Online teaching is not restricted by time and space and is repeatable, convenient and interactive, so it is the inevitable choice for sustainable development of higher education in the context of the epidemic, and it is also an important means to solve the deficiencies of China's higher education, such as insufficient teaching resources and uneven distribution of teaching resources among regions. In the post-epidemic era, the continuous existence of the pandemic makes the importance of online teaching increasingly prominent. At present, we are still exploring such kind of teaching practice, which can help us grasp the opportunities for in-depth integration of information technology with teaching and the development of teaching reform. In view of this, this paper analyzes the problems in the current online teaching mode and proposed suggestions to improve the teaching practice in the future in a bid to provide reference for the development of online teaching mode in the post-epidemic era.

2 Current implementation of online teaching at Chinese universities

Prior to the COVID-19 epidemic, Chinese scholars and education institutions had attached great importance to the exploration and study of online teaching mode, and the Ministry of Education also issued "The Guidelines for Promoting the Healthy Development of Online Teaching" in 2019. However, studies into online teaching were only limited to the academia and educational management organs then, and most of front-line teachers did not have much experience of online teaching and knew little about the methods of online teaching. The outbreak of the COVID-19 epidemic in early 2020 promoted Chinese colleges and universities to transit their teaching from "offline" to "online". Meanwhile, with the continued spread of the pandemic, teachers are also required to be proficient in online teaching mode and change their attitude towards it. In early February 2020, China's Ministry of Education issued the "Guideline on the Organization and Management of Online Teaching at Colleges and Universities during the COVID-19 Pandemic", which requires Chinese colleges and universities to actively carry out online teaching and learning so as to ensure the teaching process and quality during the pandemic, and thus realizing the goal of "uninterrupted teaching and learning". At present, online teaching at Chinese colleges and universities is mainly carried out on four kinds of platforms: the first is curriculum resource platforms such as the Chinese University MOOC platform, Treenity and XuetangX. At present, China has built a large number of first-class online courses for students at all levels. In this teaching mode, teachers should invest more energy in assisting students' learning, grasp each student's learning progress in time, and carefully organize Q&A and discussion after class. The second is the experimental platforms, such as the national virtual simulation experiment teaching comprehensive platform. These training and teaching platforms meet the needs of college teachers and students for online experiments during the epidemic, and ensure the smooth teaching of experimental courses. The third is the live broadcast platform, such as DingDing, Rain Classroom, Tencent classroom, Zoom, corporate WeChat, QQ video, etc. During the pandemic, many Chinese colleges and universities required students to attend live lectures at home. The live broadcast mode restores classroom teaching to a certain extent, but on the one hand, the live broadcast mode has high requirements for the network, equipment and other hardware

conditions. On the other hand, it is difficult for teachers to timely grasp the learning attitude, learning behavior and learning effect of students in the process of live broadcast learning. The fourth is on-campus platforms, such as curriculum center platform and SPOC platform, and teaching is mainly carried out in the form of “live broadcast” and “online interactive discussion”. During the epidemic, many higher education institutions in China established on-campus online teaching platforms, on which teachers prepared corresponding teaching resources according to the curriculum needs, and students conducted online learning independently with flexible pace according to the SPOC curriculum. Teachers answered questions, interacted and discussed with students and assigned homework comments through the platform. [3]

3 Problems with online teaching in the post-COVID-19 epidemic era

3.1 Insufficient Information Technology Guarantee

As a teaching mode that received sudden attention, online teaching faces many challenges and the primary one is the weak technical foundation and operation level. At present, each network teaching platform cannot give full play to its role. First, the lack of hardware for the operation of the platform. Online teaching needs the support of computers, PC and other electronic devices, but due to the difference of economic development level, a considerable number of students lack terminal devices such as computers and mobile phones, especially those from remote areas and poor families. Second, the limitation of network information technology. Online teaching mainly depends on network information technology. On the one hand, due to the excessive number of online users in online teaching, which exceeds the maximum carrying capacity of the platform design, it is often stuck and difficult to log in in the process of online teaching, so it is difficult to effectively promote and complete the teaching process. On the other hand, slow internet speed will directly reduce the effect of teaching and learning. Third, the proficiency of teachers and students is not high. On the one hand, in the face of the rapid promotion of online teaching, only a few teachers have the experience of building online courses, and most teachers are not fully prepared for online teaching. On the other hand, students do not have enough information technology ability and experience to deal with the sudden arrival of online teaching mode. All these lead to a large difference between the effect of online teaching and expectation.

3.2 The lack of evaluation system that meets the requirements of online teaching

Due to the lack of academic assessment system that meets the requirements of online teaching as well as the different teaching platforms and standards used by teachers, it is difficult to effectively supervise the behavior of learners and teachers, which poses a challenge to the comprehensive evaluation system of students and teachers. In the process of evaluation, there are more convenient forms of attendance investigation and after-school homework submission. But in fact, the attendance rate of students is still difficult to control, and the difference of students' actual learning progress may be greater than that in traditional classroom. Some students rely too much on playback, resulting in them not listening in class and untimely in learning, which affects the learning effect [4]. At the same time, online teaching will also lead to an increase in the amount of students' homework. On the one hand, due to the lack of effective real-time interaction in online classroom, teachers take homework as an important means to assess students' learning effect in order to

understand students' knowledge mastery; on the other hand, homework is mainly in the form of group cooperation before or it takes a long time to complete homework in offline teaching. Now each student needs to complete homework independently or within a week, which makes students tired, and their ability to think independently, express, criticize, find and solve problems cannot be effectively improved. Therefore, in online teaching, there is an urgent need to optimize the evaluation indicators to assess the learning effect of students from different perspectives.

3.3 Students' independent learning ability and self-discipline needs to be improved

Students are the participants in teaching and the main body of learning. The effective practice of online teaching depends on the transformation of not only teachers' teaching attitudes and models but also students' learning attitudes and habits. Influenced by the traditional teaching mode, most students have weak independent learning ability without the habit of online learning. They would rather listen to teachers than spend more time and energy on independent learning and innovative learning. On the other hand, home and school are two different kinds of space: "home" is a specific space that makes people feel cozy and comfortable, while "school" is a space for knowledge exchange. Under the online teaching mode, most students are in the comfortable family environment. To create a learning atmosphere at home, students need to have stronger willpower. It can be seen that students' lack of independent learning ability is one of the biggest challenges faced by online learning during the epidemic.

4 Suggestions to online teaching in the post-COVID-19 epidemic era

4.1 Strengthen the construction of information infrastructure and teachers' training

The promotion of online teaching requires the government to increase investment in information hardware equipment and teaching support system, actively give play to the role of the market in the information construction of higher education, and realize the effective co-construction and sharing of curriculum teaching platform, online teaching resources, educational data, management methods and evaluation means, which is helpful for students to adapt to online learning, intelligent assessment and service. Informatization driven education is the inevitable trend of school construction in the future. On the other hand, due to the needs of online teaching, teachers should have the ability to understand and skillfully use educational technologies and tools. Colleges and universities should strengthen information training for teachers, improve teachers' understanding of information-based teaching, let teachers fully understand the convenience and effectiveness of information-based teaching, and break through the thinking set of traditional teaching; Secondly, it is necessary to provide opportunities and platforms for teachers to share information-based teaching technology, help teachers who are not familiar with online teaching master basic online teaching technology, and improve their informatization abilities.

4.2 Construct a multi-level and open teaching evaluation system

In online teaching mode, different students have different learning contents, methods and procedures, so in teaching evaluation, more attention should be paid to assessing students' performance at different stages of a course and from different perspectives, such as what students can complete (not limited to papers or end-term exams) and what problems they can solve in practice. Teachers should also compare students' learning status at different stage and pay more attention to their personality difference. In online teaching mode, teachers can segment students into more detailed categories, and carry out teaching accordingly. They can formulate different evaluation systems according to different students. Compared with traditional offline teaching, online teaching emphasizes independent learning and group cooperation. Therefore, in the evaluation of online learning, more emphasis should be placed on students' self-evaluation and peer-evaluation, and evaluation should be more comprehensive, open and differentiated among different learners.

4.3 Pay more attention to cultivating students' independent learning ability

Online teaching provides convenience for students' learning, but this kind of teaching has higher requirements for students' independent learning ability and self-discipline. The difference in students' independent learning ability directly leads to the difference of learning effect, which has been amplified through online teaching. The cultivation of innovative talents is based on the ability to actively acquire and discover knowledge. Colleges and universities must pay attention to the cultivation of students' independent learning ability by setting up relevant courses to guide students' independent learning, help students find their life directions and plan learning. Also, teachers need to teach and share ways of independent learning, strengthen students' ability to monitor learning independently and motivate themselves, and consciously improve students' independent learning ability.

5 Conclusion

Online teaching, which integrates the "Internet +" and "intelligence +" technology, has already become an important development direction of higher education in home China and abroad. Online teaching is not the simple copy of offline teaching but the expansion and change of the teaching environment, and it lays a foundation for mixed teaching. Vigorously developing online teaching can promote institutions of higher education to share educational resources and realize more inclusive and high-quality education. Colleges and universities should actively improve the online teaching mode and lead the digital transformation of higher education with a more inclusive attitude.

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