Research on the Ways to Improve the Informatization Teaching Ability of Primary and Middle School Teachers
Thoughts Based on Online Teaching During Epidemic Prevention and Control Period

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ABSTRACT
With the continuous deepening of education and teaching reforms, cultivating and improving the informationization teaching ability of primary and middle school teachers has aroused great concern from all walks of life. In particular, the emergence of the COVID-19 has put forward higher requirements for online teaching of primary and middle school teachers, and has also placed more emphasis on improving the level of education informatization. According to the actual needs of online teaching of primary and middle school teachers against the background of the prevention and control of the COVID-19, perfecting the online teaching system of primary and middle school teachers will help solve the difficulties encountered by primary and middle school teachers in online classroom teaching, promote the reform of online curriculum teaching in basic education and explore ways to improve the information-based teaching ability of primary and middle school teachers.

Keywords: epidemic prevention and control, primary and middle school teachers, information-based teaching, path

I. INTRODUCTION

In 2016, the "13th Five-Year Plan for Education Informatization" of the Ministry of Education clearly stipulates that "to build a networked, digital, personalized, and lifelong education system, and to build a learning society in which everyone learns, everyone learns everywhere and learns all the time". [1] The "Opinions on Comprehensively Deepening the Reform of the Construction of Teachers in the New Era" issued by the State Council in 2018 clearly states that "By around 2035, teachers will actively adapt to new technologies such as informatization and artificial intelligence, and actively and effectively carry out education and teaching". [2] In February 2019, the "Implementation Plan for Accelerating the Modernization of Education (2018-2022)" issued by the General Office of the Central Committee of the

Communist Party of China and the General Office of the State Council clearly proposed to "promote the deep integration of information technology and education and teaching, support schools to make full use of information technology to carry out the reform of talent training model and teaching methods, gradually realize the full coverage of teachers and students in the application of informatization teaching and learning, innovate a new model of education governance in the information age, carry out the optimization of education governance capabilities under the support of big data, and promote the use of Internet and other information means to serve the entire process of education and teaching".[3] Informatization education is an important measure to cultivate talents in the new era, which is also an inevitable choice to help basic education teaching reform. In the context of the prevention and control of the COVID-19, the difficulty of online teaching management in primary and middle schools is increased, the experience of online teaching process control is insufficient, and the feedback effect of online teaching is difficult to monitor. It is necessary to do online teaching during epidemic prevention and control

to ensure that the expected teaching tasks are completed on time with quality and quantity.

II. Problems to be Solved Urgently in Online Information Teaching of Primary and Middle School Teachers During Epidemic Prevention and Control Period

From February to March 2020, the China Education Policy Research Institute of Beijing Normal University and the Moral Education Research Section of the Primary and Middle Schools of the Chinese Education Society investigated the satisfaction of online teaching during epidemic prevention and control. The results showed that 80.3% of the teachers recognized the effect of online teaching, and 84.07% of the students felt good about online learning. At the same time, 43.32% of primary and middle school students believe that online learning during epidemic prevention and control is not as effective as studying at school. [4] During the period of prevention and control of the COVID-19, primary and middle schools have "continues learning during the suspending classes period", and online teaching has played an active role. At the same time, some primary and middle school teachers don't have relatively mature online teaching experience and lack professional information teaching ability, which makes them difficult to adapt to the actual needs of primary and middle school online teaching in the context of epidemic prevention and control. There are mainly the following problems.

A. *The online curriculum resources of primary and middle schools urgently need to be effectively integrated*

The arrival of the "Internet +" era has created a good situation for the sharing, development and application of various Chinese and foreign educational and teaching resources, and created the prerequisites for the combing of online and offline curriculum educational resources in primary and middle schools. However, because the application of big data, cloud platforms, new media and other network information technologies is not mature enough, the information literacy of teachers in rural primary and middle schools is generally not high, and primary and middle schools have insufficient human and material security for the development of online and offline curriculum resources, the sudden occurrence of the epidemic has made it more and more difficult for the development and application of online curriculum resources in primary and middle schools. In addition, the differences in the educational level, working status, and economic conditions of the parents of primary and middle school students also lead to students' different levels of information literacy, which also makes students adapt to online teaching differently. Some primary and

middle school students from poor families lack the network equipment for online learning. These all affected the effect of online teaching.

B. *Primary and middle school teachers have difficulty in accurately judging the effect of online classroom teaching*

The emergence of the epidemic has made primary and middle schools more dependent on online network platforms for teaching. Although some schools already have an online teaching platform, they can also deliver live lectures, submit and correct homework through platforms such as DingTalk and Learning Through, teachers can't guide and observe students' learning status in a specific atmosphere like traditional classroom teaching and it is for them difficult to accurately judge the effect of online classroom teaching. In addition, students have a certain adaptation period for long-term online courses, and it is relatively difficult to maintain long-term concentration. Restricted by objective conditions, teachers can't fully grasp students' feedback performance on online classroom knowledge learning.

The classroom teaching in primary and middle schools has strong enlightening itself, which puts forward higher requirements for students to master scientific and cultural knowledge and exercise various abilities. According to the results of the "Investigation of the 'Spring Semester' Teaching Activities After the Epidemic" conducted by the China Education Policy Research Institute of Beijing Normal University and the Moral Education Research Section of the Primary and Middle Schools of the Chinese Education Society, 49.07% of primary and middle school students believe that online teaching has shortcomings that affect physical and mental health, and 69.62% of primary and middle school students believe that the learning atmosphere for home study is insufficient. If the teaching content of the curriculum can't be adjusted in time according to the requirements of the information education reform in the new era, it will affect the physical and mental development of primary and middle school students and will not be conducive to the cultivation of the core literacy of primary and middle school students. In addition, because primary and middle school teachers themselves lack theoretical guidance and case references for online teaching, they often rely on their own power to continue to explore and the methods and application skills of online classroom teaching need to be further proficient and mastered, it is difficult to meet the personalized online teaching needs of students.

C. *The difficulty of online teaching management for primary and middle school students has increased*

The emergence of the epidemic requires objectively reducing crowding, optimizing management models, innovating monitoring methods, and exploring forms of assessment. While the traditional and regular primary and middle school curriculum teaching is done in the school classroom. Few schools use online teaching platforms as carriers to carry out educational activities systematically and most schools don't establish a relatively complete online teaching management platform, relying more on traditional telephone, WeChat and other means to supervise students' online learning. Although there is a certain degree of contact between students, teachers and schools, such communication, exchange, feedback, and management are basically difficult to guarantee real-time and immediacy, and affected by the epidemic, the demand for teachers has increased, and more often students and teachers can hardly achieve one-to-one monitoring and management. Some primary and middle schools usually lack training, management and evaluation of teachers' informatization teaching ability, and don't incorporate informatization teaching ability into performance evaluation indicators. The practicality and application of training content for teachers' participation in improving informatization teaching ability need to be strengthened. As a result, the school's informatization construction level can't be improved for a long time and some teachers don't have the ability to apply online education technology to carry out online classroom teaching, affecting the quality of online teaching. Some teachers and students are not very familiar with online course teaching, some teachers are not proficient in online teaching and online learning methods and skills, and the practical experience of online education is not rich enough. For some primary and middle schools in rural areas, teachers and students rarely use online information technology to carry out online teaching activities, resulting in insufficient pre-preparation for online education during epidemic prevention and control period.

III. PERFECTING THE ONLINE TEACHING SYSTEM OF PRIMARY AND MIDDLE SCHOOL TEACHERS DURING THE EPIDEMIC PREVENTION AND CONTROL PERIOD

"Primary and middle school education informatization is a method of applying information technology and other methods, with the aim of improving students' interest, and its purpose is to maximize the effect of online teaching at the minimum cost." [5] In order to fully complete the online teaching management of primary and middle schools during the epidemic prevention and control period, it is necessary to continuously optimize and improve the online classroom teaching system for primary and middle school teachers, promote the organic integration of educational information construction and online teaching management, provide basic guarantee for primary and middle schools to better carry out online teaching activities, and create prerequisites for teachers and students to better conduct online and offline integrated teaching.

A. *Building an online education management platform for primary and middle school students*

First, it is important to systematically construct an online education management carrier for primary and middle school students under the epidemic situation. It is necessary to apply big data in the era of "Internet +", cloud computing, multimedia and other information technologies, invite professional technicians or scientific research teams to design and develop online education management websites, web pages, Internet applications or applets for primary and middle school students so as to facilitate the innovative development of online education management in primary and middle schools during epidemic prevention and control period. Second, it is necessary to establish and improve the online education management mechanism for primary and middle school students under the epidemic situation. It is possible to rely on the online education management platform for primary and middle school students to design rules and regulations for online education management for primary and middle school students, require students to regularly report on the specific situation of curriculum knowledge learning, stipulate that students submit periodic and final assessment work materials through online platforms, clarify the content and responsibilities of teachers, schools and parents in the process of monitoring and evaluating students' learning status, and highlight the primary status of primary and middle school students. In addition, primary and middle schools need to actively organize teachers to carry out collective lesson preparation, carry out cross-school and cross-regional interscholastic cooperation, share high-quality online education and teaching resources, and strengthen the construction and management of online teaching resources database.

B. *Doing a good job in online education management services for primary and middle school students*

On the one hand, it is important to timely release dynamic information on the epidemic situation, which is convenient for optimizing the epidemic prevention work. Online education and management platform should be used to timely release the progress of the epidemic prevention and control situation in various regions, so that primary and middle school students can timely grasp the epidemic situation, primary and middle schools can adjust students' online classroom teaching

plans, and schools, teachers, students and parents can work together to prevent and control the epidemic. On the other hand, communication and feedback of students' physical condition is convenient for online education and teaching. Teachers need to communicate and feedback the students' physical conditions during the online course in a timely manner, find physical problems in time and provide effective help, and adjust the subject curriculum guidance program for the epidemic prevention and control problems encountered by students in online classes.

C. *Exploring the online teaching monitoring mode for primary and middle school students*

The design and construction of the online network education management platform should reflect the systematic, operable and rigorous nature of epidemic prevention and control and knowledge learning. The sub-modules of the online course teaching process management system should be designed in accordance with the corresponding standards and norms. In particular, it is necessary to monitor the whole process of online teaching pre-preparation, in-class learning, and after-school review of primary and middle school students. It is also necessary to supervise and manage the learning performance and attention participation of primary and middle school students at all stages of online network classroom teaching to ensure timely find problems in the online teaching process and timely adjust the epidemic prevention and control program and curriculum teaching mode. At the same time, the progress of online courses in primary and middle schools should be supervised and guided throughout the process. The online teaching platform and Learning Through can be used to manage and supervise the participation of primary and middle school students in online learning of various subjects. The time, frequency and duration of students' real-time online learning activities are statistically analyzed based on big data so as to provide timely feedback on students' learning status and help teachers adjust online teaching plans.

D. *Quantifying the online teaching evaluation indexes of primary and middle school students*

By distributing online questionnaires, conducting telephone interviews, video interviews, symposiums and experience exchange meetings, it is possible to understand the views of primary and middle school students on the prevention and control of epidemic situations. For the feedback performance of online course knowledge learning, it is needed to consult the opinions and suggestions of teachers and parents and incorporate epidemic prevention and control into the teaching evaluation index system. According to the collected empirical research data, information, materials as well as the characteristics of online teaching, it is necessary to scientifically quantify the

evaluation indicators for the completion of online learning tasks and the evaluation indicators for the staged examinations. A comprehensive and systematic assessment should be conducted on the physical, learning and psychological conditions of primary and middle school students during the epidemic prevention and control period, and a teaching evaluation scale should be designed to continuously improve the quality of online teaching.

IV. PRACTICAL COUNTERMEASURES TO IMPROVE PRIMARY AND MIDDLE SCHOOL TEACHERS' INFORMATION TEACHING ABILITY DURING EPIDEMIC PREVENTION AND CONTROL PERIOD

The online curriculum construction, resource integration, and content development of primary and middle schools under the epidemic have been affected. In particular, it is difficult to ensure the integration of online and offline teaching, and it is difficult to ensure the real-time and effectiveness of online course teaching. There is an urgent need to reduce the impact of the epidemic on online course teaching by improving the information teaching ability of primary and middle school teachers, ensure the completion of quality and quantity of the regular course teaching tasks, and provide scientific guidance and practical reference for Qingyuan Polytechnic and more brother schools to better carry out online curriculum teaching activities and better deepen the reform of informatization education.

First, diversifying and sharing online teaching resources in primary and middle schools. Cloud platforms, Internet, multimedia, new media and other means create conditions for students to learn the curriculum knowledge of various subjects in primary and middle schools through various campus websites, network platforms, live broadcast software, etc., which is convenient for primary and middle school students to learn the curriculum knowledge in a timely manner through computers, collections and other diversified methods and share teaching feelings and experiences.

Second, establishing a teaching community to carry out collective teaching research on primary and middle school teachers so as to carry out cross-school and cross-region cooperation, jointly prepare lessons, coordinate teaching and research and work together to teach and so on. By jointly sorting and integrating Chinese and foreign high-quality curriculum resources for teaching various subjects in primary and middle schools, and combining with the grasp of the development trend of online teaching models, materials such as online videos, documents, and pictures of primary and middle schools online courses can be updated in time. Based on the requirements of

informatization education and epidemic prevention and control, the teaching content of various subject courses can be scientifically innovated. At the same time, teachers with strong information-based teaching ability can guide and help other teachers improve their information-based teaching ability, communicate with others about possible problems in the online teaching process, and carry out cooperative teaching.

Third, the staged evaluation tests the online curriculum learning effect of primary and middle schools. By issuing periodic learning tasks, course assignments, assessment and examination every day and every week, students are urged to participate in online course learning on time and develop regular learning habits of online course, which can avoid students' delay or even not participating in online course learning. And at the same time, teachers should criticize students who have not completed the learning content of phased course in time. In addition, it is important to pay attention to play the synergy of home and school and collaboratively cultivate students' good online learning habits.

V. CONCLUSION

In general, the online teaching effect of primary and middle schools during epidemic prevention and control period needs to be further demonstrated. There are some problems that need to be solved in practice in the development of online teaching resources, the construction of online teaching platforms, and the optimization of online teaching management. In addition, the informatization teaching ability of primary and middle school teachers is also uneven. It seems that there is insufficient experience in applying education information technology to online course teaching and epidemic prevention and control work. It is necessary to improve the online teaching effect during the epidemic prevention and control period by improving the online teaching system of primary and middle school teachers and improving the information-based teaching ability of primary and middle school teachers, so as to take this opportunity to promote the information-based education reform of primary and middle schools and build an information-based teaching faculty.

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