

# The Current Situation, Problems and Countermeasures of Online Teaching in the Post-Epidemic Era—Based on the Perspective of Educational Ecology

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**Abstract:** Since the outbreak of the Covid-19 pandemic, schools of all levels and types have carefully organized and carried out online teaching in accordance with the spirit of the Ministry of Education's instructions, and achieved remarkable results. This paper analyzes the current situation and problems of online teaching for teachers and students during the epidemic, and how to solve these problems in the post-epidemic era, explores new teaching models to make reasonable educational decisions, implements effective educational response measures, and improves teaching quality.

**Keywords:** post-epidemic era, online teaching, education ecology

## 1. Introduction

At the beginning of 2020, a sudden new crown pneumonia virus swept the world. In the big test of this epidemic, China took the lead in handing over a perfect answer sheet. The whole country united to fight the epidemic, and controlled the spread of the virus by suspending work, production and school for 2 months. During the epidemic, for the physical and mental health of all students, the Chinese Ministry of Education first issued a notice to postpone the start of the spring semester, which relieved parents' anxiety about students contracting the virus at school, and at the same time launched carefully prepared online teaching resources to "suspend classes" keep learning" [1].

In the post-epidemic era, many online teaching guidelines and policies of the Chinese Ministry of Education are worth learning from abroad. From the perspective of teachers and students, the Ministry of Education of China analyzes the common challenges faced by the education system: education departments and schools need to ensure the quality of students' learning and solve the technical, hardware and software problems of teachers' online teaching. It is necessary to reconstruct the teacher-student relationship and innovate teaching design; students need to change the home-school learning mode and adjust their learning methods and habits, and support students whose basic learning conditions cannot be guaranteed to carry out online teaching smoothly.

## 2. Theoretical basis: educational ecology

In the post-epidemic era, how students learn online is thought-provoking. Whether it is for contemporary students or the education sector, online learning is neither a last resort during the epidemic, nor can it be turned a blind eye as it was before the epidemic. Mixed learning between online and offline has disappeared. Voice has become the regular path for students to acquire knowledge, which is a great and far-reaching educational experiment. Colleges and universities must take the initiative to meet this rare opportunity to promote education reform and explore new laws for students' online learning [2].

Educational ecology was first proposed by American educator Kremin. The core of Kremin's educational ecology thought is that he regarded education as a complex, organic and unified ecosystem. He used the theory of ecology to analyze education for the first time. The ecological relationship between the various factors of the system and the inter-relationship among the various factors of the educational ecosystem are dynamically presented as unity and contradiction, balance and imbalance.

Educational ecology studies the law of education development from the relationship between the material and spiritual environment of education, realizes the exchange of material, energy and information inside and outside the system, in order to improve the efficiency of education, guide us to understand educational phenomena, and solve educational problems [3].

Educational ecology is a science that uses the principles and methods of ecology to study educational phenomena. The approach of educational ecology is to examine various educational institutions and structures in relation to each other and to the wider society that sustains them and is influenced by them. Hussen believes that the research line of educational ecology has focused on individual children and their experiences and school performance, and has now turned to the study of a series of factors that constitute the educational environment in which children grow up. Therefore, for the school, it is necessary to connect and link with other educational institutions, and also have its own agenda. The purpose of the latter is to maintain the integrity and balance of the school itself [4]. School is an extremely important ecological environment. We should not only explore the distribution mechanism of schools in various ecological environments, but also explore the various ecological environment elements within the educational ecosystem that affect the development of educational and teaching activities and the physical and mental development of students. The purpose of educational ecology research is to reveal the law and ecological mechanism of educational development, and explore ways and methods to optimize the educational ecological environment by analyzing the complex and dynamic relationship between various educational ecological environmental factors and the development of educational undertakings [5].

American scholar Ogbe tries to study how the relationship between the community environment and the school environment affects learning, and tries to use it to link various macroscopic and microscopic studies to gain a multi-level understanding of the educational process. Use "The Ethnographic Ecology of Schooling" to examine the interrelationships among students, parents, teachers, learning staff, and "taxpayers." The educational ecological environment is diverse rather than single, and different participants, students, teachers, parents, educational administrators and politicians, have different environments in this system [6].

In contemporary society, learning is no longer dominated by teachers and supplemented by students, but an educational model centered on students' learning should be established. Social constructivism and educational ecology theory will become an important theoretical basis for educational development and innovation. In the post-epidemic era, educational ecology theory has important guiding significance for students' online learning. During the epidemic period, the ecological environment of traditional face-to-face classes has been transformed into the formation of learning communities. In the original class system, due to online teaching, students who choose the same subject are automatically formed as learning partners. The learning form is mutual assistance and independent learning. Communication and learning, mutual support and encouragement, the seemingly loose learning community has become closer because of the formation of learning partnerships, and students' autonomous learning ability has been improved and practiced.

### **3. The current situation and problems of teachers' online teaching - during the epidemic**

The emergency online teaching has put all teachers in a severe test of their teaching skills. As the designers and organizers of online teaching, teachers play a leading role in the online learning process of students. In this era of information and knowledge explosion, teachers can only be good guides for students in the big test of the epidemic only by constantly learning new educational and teaching skills and improving their information technology literacy. Teachers need to change the teaching concept, enhance the effect of course teaching, deepen the way of teaching reform, and master the development of information technology. Before teachers conduct online classroom teaching, they should not only do sufficient lesson preparation work, master the teaching methods and methods, but also understand the use process of the entire online teaching platform to ensure smooth network. The emergency online teaching caused by the epidemic is a practical training ground for teachers to adapt to future online and offline teaching. Teachers need to reflect while learning, improve while teaching, practice their true skills in actual combat, and find ways to improve online teaching means.

The teaching tasks that need to be completed in traditional face-to-face courses are transferred to students online through live broadcasts. Teachers are required to carefully design teaching tasks. In fact, teachers need to invest more time and energy, which puts forward higher requirements for teachers' education and teaching ability and quality. If online teaching wants to achieve the same teaching effect

as the traditional classroom, it is far from enough to communicate with students through video. It is impossible for students to absorb the course content through live online courses and browsing a large amount of texts. This actually puts forward higher requirements for teachers' online teaching effect. Teachers should guide students in learning methods, carry out in-depth online communication, diversify teaching forms, and enhance communication between teachers and students.

### ***3.1 Proficiency in online teaching techniques and methods***

Transplanting traditional classrooms to online, teachers are still very unfamiliar with online teaching operations. There is no doubt that teachers will face many practical difficulties. First, they need psychological and technical buffers, and then gradually transform into a process of adaptation and proficiency. Online teaching relies on information technology, which puts forward high requirements for teachers' information literacy. Although teachers' information literacy has been improving in recent years, emergency online teaching is still confusing. First of all, teachers should choose their own habits or familiar platforms for online teaching. 's online platform has teachers in a choice phobia. Teachers have high-intensity online training and self-learning drills in a short period of time to master the teaching skills of the network platform. It is polite to spend many times more time than usual to carefully prepare the content of the lectures. Emergency plans for emergencies such as freezes, slow network signals, and delayed feedback information. For in-depth study of the excellent online course resources provided by the school and the Ministry of Education, refer to the rich online education and teaching content, distribute the preview materials of this course in advance for each class, and communicate with the students on the digestion of the previous course in the discussion area. Begin to prepare for the next class. In the course of teaching, according to students' feedback and absorption of knowledge, constantly modify and optimize their own classroom teaching content, continuously improve teaching methods, and improve the quality and level of online teaching.

### ***3.2 Careful teaching design to improve teaching level***

Teaching design is very important to the quality of teachers' online teaching. The selection of teaching materials, the progress of courses, the organization and development of teaching, and the way of interaction and discussion between teachers and students will all affect the effect of teaching. The Ministry of Education requires online teaching to give full play to the advantages of Internet resource sharing, do a good job in teaching design, fully listen to students' feedback, and adjust teaching content, teaching strategies and teaching progress.

Teachers design their own teaching goals and expected teaching results, and design specific implementation plans according to the teaching goals. When students study at home, the teaching design can be richer and fuller. At the same time, the introduction of ideological and political education related to the epidemic is also the main content of patriotism education. Improve teachers' theoretical basic knowledge and education and teaching skills, master the in-depth integration of information technology and disciplines, grasp the depth and breadth of teaching content, and complete teaching content to achieve teaching goals. Collect and organize course-related materials before class, teach in class, and discuss after class. To guide students to develop the ability of independent learning, they can conduct effective self-study after class according to the teaching materials provided by teachers.

Online teaching content forms are more diverse and easier to understand. Online teaching breaks the boundaries of traditional subject knowledge, is problem-oriented, takes knowledge points as units, and presents students with personalized learning navigation tools with a networked knowledge hierarchy. In the process of online teaching, teachers should make good teaching design for the selection of teaching materials and materials, what to teach, how to teach, online answering of students' questions, interaction between teachers and students, allocation of discussion time and course evaluation.

Teachers' online teaching design needs to conform to the cognitive laws and knowledge structure of the contemporary digital natives' brains, meet the learning habits of college students in the new era and the target needs of talent training, and build a systematic, mature and effective teaching theory design and teaching practice. Teachers cannot simply transfer traditional classrooms to online teaching classrooms. Successful online teaching requires a solid theoretical support of teaching design. The theoretical research on online education in the world has guiding significance for online teaching design, giving full play to artificial intelligence, Internet +, and big data. The advantages of online intelligent technology such as 5G technology and cloud computing can effectively improve the effect

of students' online learning. In this epidemic, teachers should reflect on their own teaching design. Teachers, as teaching designers and guides of students' learning, should strengthen the mutual assistance between teachers and students in the classroom through rich network resources and online teaching design, arouse students' interest in learning, cultivate independent learning ability, and cultivate students' learning ability form good study habits.

#### **4. Current situation and problems of students' online learning - during the epidemic**

During the epidemic period, students studying at home should shift their focus to "student-centered", how to improve students' self-learning ability, give full play to students' initiative in learning, and strengthen cooperative learning between students, so as to improve students' learning efficiency .

Students studying at home need certain information literacy, and they can use various online learning platforms at all levels under the guidance of parents and teachers. Learning initiative requires students to have strong self-management ability, self-monitoring ability and self-evaluation ability. There are differences in students' study habits, learning ability and purpose and motivation, resulting in many students not having the initiative to study. In the online learning environment at home, many students cannot resist the temptation of online information and various mobile games, and are easily distracted and deserted; some students chat with their classmates and friends while in class, and some are attracted by pop-up information and news, unknowingly I switched the class page to a news page, and even started a Weibo Moments. What's more, after signing in, I closed the class platform and watched Tiktok and videos with great interest. In a free and open network environment, without effective supervision and management, students' online learning is useless and has no effect. In the process of online learning, how to share high-quality learning resources through the Internet, and how teachers can guide students to increase their participation in the learning process in the classroom, so as to achieve the goal of optimizing the effect of online learning, are topics worth exploring.

Students who are accustomed to the traditional face-to-face learning method have weak online learning ability, and online learning requires students to have higher learning initiative, learning enthusiasm and self-management ability. Students need the assistance and guidance of teachers and parents. Students need to follow the teaching plan designed by teachers. After gradually familiarizing themselves with the online learning method, they should actively participate in teaching activities, communicate with teachers and classmates, conduct group discussions to complete homework tasks, and use the rich Internet resources for thematic discussions and deep thinking. Compared with traditional face-to-face courses, the most deadly aspects of online learning are the sense of isolation in time and space and the sense of loneliness in learning. At this stage, online platforms should be committed to solving this problem, such as setting up "chat rooms" or "discussion areas" to allow teachers and students to learn. There are opportunities for instant communication with students and students, so that students can ask questions to teachers at any time in online classes, and conduct group discussions and share learning materials between students and students.

#### **5. Strategies for improving students' online learning - post-epidemic era**

The emergency launch of online teaching not only solves the urgent needs of schools and parents about the difficulty of students going to school during the epidemic, but also is a good training for online teaching. In the post-epidemic era, how to better combine online and offline teaching, under the overall planning, coordination and organization of the education department, teachers and parents work closely together to build a new situation of home-school cooperation.

The online classroom is a way of learning at home, which greatly saves the time for teachers to commute to work and students to commute to school. An online live broadcast can accommodate thousands of people, greatly expanding the scale of teaching, and online live teaching videos can also be saved and played back. High-quality teaching resources can be reused, reducing teaching costs, improving resource utilization, and providing teaching objects in a convenient way, teaching resources and the breadth of teaching time and space provide possibilities for popular lifelong learning in the future.

#### **6. Make good use of information technology to carry out home-school cooperation**

Build a mature information ecological environment through information technology, and extend the

information platform of the education system to the family, so that the home-school collaboration can be seamlessly connected, so that teachers, students and parents have their own complete and independent use paths, and do not need to be busy switching between different a learning platform that adapts to different platforms. For students to adapt to the information society and become lifelong learners of the information society, it is necessary to open social education places such as libraries, children's palaces and museums to parents and students. These places provide students with information services with important educational significance place.

Under the overall planning of the Chinese Ministry of Education, this large-scale emergency online teaching during the epidemic is a full-scale training and widespread popularization of the Ministry of Education's use of information technology for teaching, and it is a real shot of the online education achievements accumulated over the years. The actual military parade is a vivid experiment combining modern information technology with classroom teaching.

Home-school cooperation makes good use of information technology, and virtual learning communities can replace common communication tools such as telephone, WeChat and QQ, and better support home-school cooperation in work. China's "home-school co-education" digital platform and online learning space are accessible to everyone, and each has its own characteristics, enabling home-based online learning and smooth communication between school teachers during the epidemic. Many mature informatization platforms have cooperated with schools to develop Tencent Smart Campus. The functions and applications in it fully cover the release of learning materials, download of courseware, release of homework, and playback of course videos during face-to-face teaching. You can even query parents' address books, class Weibo, and WeChat. Groups and official accounts, I believe that after this round of baptism of online platforms, parents and teachers have found a better way to communicate with each other.

## **7. Policies and systems to promote the improvement of online teaching**

Local governments are actively promoting the construction of Internet infrastructure. During the epidemic, the Chinese Ministry of Education launched a national online cloud platform with rich resources and high-quality courses, covering various disciplines and stages, strengthening online learning support for disadvantaged groups, and promoting education equity in poverty-stricken areas. Promote the popularization of the Internet in poor and backward areas, and subsidize and help poor students and left-behind children from families who do not have computers and mobile phones to learn online. After returning to work, parents are unable to accompany and help their children log in to online classes, and even some uneducated parents have very low information literacy and have no way to understand the equipment of online classes and guide their children to achieve online learning. Many children from poor families do not have enough mobile phones and computers for online classes. Schools and teachers should provide more phone calls and homework assignments to narrow the gap in learning.

Education administrative departments strengthen the integration of educational information systems and data sharing, build digital educational resource standards, jointly build and share high-quality educational resource libraries, and build content including educational digital resources, technical facilities, and educational data, covering the openness and interactivity of various disciplines and majors resource library. Improve the co-construction and sharing mechanism of resource pools, strengthen the promotion and sharing of high-quality educational resources, and promote positive interactions between schools and enterprises and between home and school, so as to realize the effective connection and sharing of educational resources, comprehensively promote the upgrading of educational resource supply models, and improve the quality of education, to promote educational equity.

The new semester is about to start. The school conducts a thorough diagnosis of the effect of online courses through various forms such as questionnaires or assessments, formulates targeted teaching plans for different types of students and majors, adjusts teaching progress and time, and teaches students according to their aptitude. However, it is different from elective courses or stratified teaching. During the epidemic, the Chinese Ministry of Education promoted the five educations of "morality, intelligence, physical beauty and labor", strengthened patriotism education and mental health education during home isolation during the epidemic, and shared and passed on advanced deeds and touching positive anti-epidemic energy. In the post-epidemic era, while coordinating schools to promote epidemic prevention and control, the Ministry of Education has scientifically formulated a normalized

teaching plan for epidemic prevention and control and an emergency online teaching plan for emergencies. The school attaches great importance to natural science education and despise humanities education. In the post-epidemic era, it strengthens life education, integrates quality education such as art and sports into life, develops humanities, and creates extracurricular expansion activities.

The designation and implementation of various school policies require the support and active participation of parents, and good home-school coordination can reduce the resistance of schools to decision-making and policy-making. In the post-epidemic era, students' health check-in, the popularization of normalized epidemic prevention knowledge, and online and offline teaching arrangements all require the participation and understanding of parents. The school strengthens the performance appraisal of online teaching, optimizes teaching work assessment and teaching evaluation, and conducts differentiated management to motivate teachers to engage in online teaching. In the post-epidemic era, repeated epidemics have become the norm. Teachers and students need to have the ability to temporarily switch to online teaching. Schools in individual epidemic-affected areas cannot rule out switching to pure online teaching at any time. Adopt an intelligent learning platform, promote the deep integration of information technology and teaching, strengthen teaching research and guidance, and focus on problem-oriented and situation-based inquiry-based classroom teaching in a digital environment.

## **8. Personalized student self-directed learning**

Schools formulate learning plans by classification. For different groups and different categories of students, schools should implement targeted learning plans, using conventional teaching and non-conventional teaching. For online learning, students should first choose the courses they are really interested in, and make sure to develop the habit of logging on to the course platform from time to time every day, so that they can communicate and interact with teachers and classmates every day, understand the learning content and course dynamics, and effectively improve their enthusiasm for learning and learning content engagement. Before choosing a course, students should have an estimate of their interests and hobbies, and be aware of their own knowledge structure and learning methods, so as to choose courses that suit them, and then learn selectively and proactively. Set up online learning groups, implement peer-to-peer learning, arrange groups in a differentiated way, reasonably arrange students of different levels and students without parents to accompany each other on common learning tasks to help and counsel each other, and serve as "small class teacher" for students with strong online learning adaptability", to help the learning of the underachievers.

The advantage of students' online teaching is personalization. In the post-epidemic era, the inherent needs of Internet + education have been activated. Students' online learning takes advantage of the advantages and functions of emerging information technologies such as artificial intelligence in big data, information transmission and intelligent recommendation, giving birth to new education and teaching methods and new teaching service methods. Compared with the limitations of paper textbooks, virtual simulation, speech recognition and image recognition in artificial intelligence technology can greatly improve the learning experience and enhance the learning effect. Students make full use of the resources of the online learning platform, make annotations on digital textbooks, upload homework and take notes, and form personalized learning records and tracks. Tailor-made educational programs for students.

The use of artificial intelligence in the field of education has always been a hot topic of research and exploration. Products such as intelligent learning companions, intelligent teaching assistants and educational robots have appeared one after another. During the epidemic, they acted as teachers' assistants and parents' nanny to help teachers supervise students' health learning progress, accurate and timed release of course information and assignments, and personalized push of learning resources. Assist parents to remind their children to go to class and do homework in a timely manner, and guide their children to study. Parents, as children's home study supervisors, should play a role of companionship, encouragement and demonstration in the process of home learning, assist children in completing online classes, and help children develop good study habits.

## **9. Conclusion**

The epidemic will eventually be defeated, because the new crown ravages the world, and such large-scale online teaching is unprecedented in human history. Opportunities and crises will always

coexist. In the era of artificial intelligence, Internet + education has brought a new dawn to educational reform. The in-depth integration of intelligent technology into online teaching is transforming into a process of teaching reform supported by physical space, social space and information space. Although education informatization has promoted teachers' online teaching and students' online learning, the online teaching innovation theory is lacking, the hardware guarantee conditions for online teaching are lacking, and the online-offline integrated teaching model has not been put on the agenda. Based on the theoretical perspective of Kleming's educational ecology, feasible strategies and plans are put forward for the practice of online teaching in the epidemic era, that is, making good use of information technology to carry out home-school cooperation, and policies and systems to promote the improvement of online teaching and personalized student self-learning. Online teaching requires the coordination and cooperation of education authorities, educational guidance agencies, parents, teachers and students in order to promote education reform. Education authorities issue policies from top to bottom and allocate human, material and financial resources to ensure the implementation of online teaching and ensure education fair.

## References

- [1] Ministry of Education. *The General Office of the Ministry of Education, the General Office of the Ministry of Industry and Information Technology, on the postponement of the opening of primary and secondary schools notice on work arrangements for "suspending classes without stopping" during the semester*[DB/OL].[2020-02-12].[http://www.moe.gov.cn/srcsite/A06/s3321/202002/t20200212\\_420435.html](http://www.moe.gov.cn/srcsite/A06/s3321/202002/t20200212_420435.html).
- [2] Guo Zhenhu. *Exploring the new normal of online learning for primary school students in the "post-epidemic era"* [J]. *Teacher Training for Primary and Secondary Schools*, 2021, (02)
- [3] Fan Guorui. *Educational Ecology* [M]. People's Education Press, 2000.
- [4] Hu Sen. *The current trend of education* [J]. *Global Education Outlook*, 1988, (03): 189.
- [5] He Zubin. *Review of Higher Education Ecological Research* [J]. *Journal of Guangxi Normal University (Philosophy and Social Sciences Edition)*. 2005, (01)
- [6] Xu Xiaohong: *Research on the Cultural Ecology of Rural Junior Middle School Classrooms under the New Curriculum Reform*, Southwest University, Master, 2010.