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EDITORIAL

When Education Faces the COVID-19 Pandemic

Editorial Office of *Science Insights Education Frontiers*

IN the face of COVID-19, countries around the world have taken proactive measures accordingly. While actively controlling the epidemic, most countries are also actively exploring how to maintain normal social functioning and provide basic education activities within our ability. With the spread of COVID-19 worldwide, many countries have adopted online education and teaching activities accordingly.

In order to provide a better reference for online education activities in various countries, the Editorial Office of Science Insights Education Frontiers organizes and publishes special issue to report the situation of education during the pandemic, as well as the practices and experiences of online education activities. Meanwhile, theoretical exploration and evidence-based studies are conducted on this brand-new educational activity.

In this special issue, we include not only the overall consideration of school education during the pandemic, but also evidence-based studies on the effects of education measures. There are teaching strategies adopted by countries in the face of the COVID-19 pandemic, as well as psychological comfort and intervention for students. There are not only the teaching methods of elementary and middle schools, but also the technology support to the regional teaching activities. There are reports on the status of online education where they are suffering from the pandemic, as well as measures to deal with the pandemic when the school resumes learning after the COVID-19 has gradually been controlled.

The editorial office of the journal hopes that through the publication of this special issue, it will provide certain experience and necessary reference for countries in the world to carry out education during and after the epidemic. What we particularly need to acknowledge hereto is that some of the manuscripts presented in this issue are not "academic research" in a strict sense. We believe that at such an urgent moment, academic standards should give way to realistic needs to a certain extent. In addition, after this special issue, we will continue to solicit and publish outstanding manuscripts about COVID-19 and its impact in the field of education.

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ORIGINAL ARTICLE

Challenges of "School's Out, But Class's On" to School Education: Practical Exploration of Chinese Schools during the COVID-19 Pandemic

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***Abstract**: "School's Out, But Class's On", i.e. "suspending classes without stopping learning", specifically refers to China's education and teaching activities during the postponement period during the COVID-19 pandemic prevention and control. This was an emergency measure to prevent and control the pandemic in the field of education in China, and it was also a continuation of school education in this special period. During the pandemic period, how school education should operate has become a topic of social concern. I herein discuss the origin and connotation of the concept of "School's Out, But Class's On", analyze the challenges of "School's Out, But Class's On" to school education, and then put forward measures for schools to respond to "School's Out, But Class's On" and explain the practical significance of "School's Out, But Class's On" for school education.*

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***Keywords**: COVID-19 Pandemic; School's Out, But Class's On; School Education; Online Teaching; Students Study at Home*

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AT the end of 2019, COVID-19 epidemic broke out in Wuhan of China. Because of the strong concealment and contagiousness, rapid spread, and extremely harmfulness, it quickly swept across other regions of the country. Subsequently, 30 provinces, municipalities, and autonomous regions nationwide successively initiated the first-level responses to a major public health emergency. In order to protect the lives and health of the people, the China government has organized a variety of forces to carry out prevention and control, and adopted various measures to prevent the epidemic from spreading on a large scale. According to a report published by the *New York Times*, about 760 million people in China were in a state of "confinement" (Robert, 2020).

In order to prevent the spread of the pandemic (*Editor's note: due to the COVID-19 was defined as a pandemic by the World Health Organization, so we herein use "pandemic" over "epidemic"*.) to schools and reduce the impact of pandemic on teaching, the Chinese Ministry of Education has issued notices that required schools of all types to postpone the 2020 spring semester and encouraged the provision of guidance services for students' home study via the Internet. Thus, the implementation of "School's Out, But Class's On" during the postponed period could be realized.

Although "School's Out, But Class's On" was a measure for home study during the pandemic, its essence was still a continuation of school education. Schools are the main implementers of "School's Out, But Class's On". During the postponed period, each school integrated different types of resources to provide services and support for the home study and to ensure an effective implementation of "School's Out, But Class's On" policy. This article starts with a discussion of the school education, and then analyzes and summarizes the measures implemented by schools during the pandemic period, and hopes to provide reference for school education during the pandemic in other countries.

Because school education involves all types of schools including universities, middle schools and elementary schools, and due to the limitation of information, this article only analyzes the measures of elementary and middle schools during the pandemic period, and the situation of universities will be analyzed in another article.

Origin, Connotation and Requirements of "School's Out, But Class's On"

The concept of "School's Out, But Class's On" originated from a series of documents from the Chinese Ministry of Education. In order to control the deterioration of the pandemic, the State Council has repeatedly extended the Spring Festival holidays, and the postponement of the spring semester has become a foregone conclusion. On February 10th, 2020, the Ministry of Education issued the "*Notice on Several Issues concerning Targeted Teacher Work during the Pandemic Prevention and Control*". This notice proposed "suspending classes without stopping teaching and learning" from the perspective of teachers' work; it required education departments and schools to organize teachers to carry out online teaching according to local conditions, and to ensure that

teachers undertake online teaching, tutoring, and homework corrections. All these work would be included in the workload as performance management, and thereby eliminated the worries of teachers (Ministry of Education of the People's Republic of China, 2020). On February 12th, 2020, the Ministry of Education and the Ministry of Industry and Information Technology jointly issued the "*Notice on 'School's Out, But Class's On' Work Arrangements during the Postponed Period*". This clarified that during the postponed period, in addition to the pandemic prevention and control, the major task was to conduct "School's Out, But Class's On" (Ministry of Education of the People's Republic of China, 2020). On February 28th, 2020, the Ministry of Education issued a "*Notice on Coordinating the Prevention and Control of COVID-19 Pandemic in Education System and Education Reform and Development*". This again emphasized "School's Out, But Class's On" from the perspective of online education and teaching, and believed that this was a test of the ability of the education system to respond to a major public health emergency. Therefore, it is of great significance to use information technology to promote education and teaching reform (Ministry of Education of the People's Republic of China, 2020). For this reason, "School's Out, But Class's On" has become a specific concept of education and teaching in elementary and middle schools during the pandemic prevention and control.

What is the deep meaning of "School's Out, But Class's On"? First of all, the understanding of its connotation is also constantly deepening and changing. "School's Out, But Class's On" refers to a state in which the school operates during the postponed start of the 2020 spring semester due to the pandemic. The appearance of this state has led to the inability of teachers and students to carry out educational and teaching activities in the school environment, and the school's operation can only be realized through the online platform. Therefore, "School's Out, But Class's On" does not only refer to online teaching or online learning, but a broad-based teaching and learning during a special period and in a special environment. The relevant notices issued by the Ministry of Education also gradually made it clearer that "School's Out, But Class's On" is a kind of broad-based learning, and online teaching is only one kind of format and it cannot completely replace classroom teaching (Ministry of Education of the People's Republic of China, 2020).

"School's Out, But Class's On", as the China government's overall deployment of school education during the pandemic prevention and control period, put forward the following seven requirements (Ministry of Education of the People's Republic of China, 2020):

(1) Strengthen student home study guidance. It is necessary to arrange the work and rest time reasonably, so that the teaching content and the teaching time are appropriate.
(2) Standardize online teaching behaviors, so as to prevent increasing the burden on teachers and students.
(3) Further improve the construction of online learning platforms for elementary and middle schools, and continuously enrich the learning resources, and pre-

vent coping the normal classroom teaching methods, duration and arrangements.

(4) Strengthen the review mechanism of online teaching resources of elementary and middle school students, and strictly review the online learning resources to ensure a high quality.

(5) Make full use of the free learning resources provided by the national elementary and middle school network cloud platforms and the China Education Television Channel 4 air classroom to serve students' home study and ensure the learning needs of students in rural and remote areas.

(6) Integrate epidemic prevention, life education, public safety, and mental health into online e-learning.

(7) Concerned about the physical and mental health of students, guide students to strengthen physical exercise, and seriously improve myopia prevention and control.

Challenges of "School's Out, But Class's On" to School Education

A school is a place where the formal education activities can be provided. In the strict sense of formal education, school education excludes all informal learning opportunities. During the prevention and control of COVID-19 pandemic, the education and control measures of "School's Out, But Class's On" proposed by the Chinese government have expanded the scope of school education. It also includes so-called non-formal learning opportunities, thereby challenging school education in many ways. The "School's Out, But Class's On" initiative proposed by the China government has expanded the scope of formal school education. It also includes some so-called informal learning opportunities, which thereby challenges school education in many ways.

Challenges to Traditional Forms of School Education

In the traditional form of school education, schools and classrooms are the basic places for education and teaching. In the classroom, teachers pass knowledge to students, and students learn what teachers instructed, so this is obviously a typical form of education. In this form, teachers fulfill their responsibilities by completing the teaching tasks of each lesson, and students engage in learning and complete learning tasks under the teacher's supervision. The physical space of schools and classrooms has become a necessary condition for school education and teaching activities. However, during the postponed period, neither teachers nor students can come to school, and the physical space for regular education and teaching no longer exists. To complete the task of "School's Out, But Class's On", it is necessary to transfer the physical space of the traditional school education to the virtual space of the Internet platform. How teachers and students adapt to the virtual teaching space is a challenge to the traditional form of education.

Challenges to Teachers' Teaching Methods

In traditional classroom teaching, teachers need to carry out teacher-student and student-student interaction in a variety of ways in order to attract students to participate in the classroom and reflect the teaching concept of "student as the main body". "School's Out, But Class's On" has brought about changes in the teaching environment, making teachers' teaching methods shift from offline classroom to online teaching. In comparison, online teaching cannot achieve the face-to-face emotional communication between teachers and students, and lacks real-time feedback of information and classroom constraints. When face-to-face classroom teaching is not available, and how to use online resources to implement online teaching activities based on the characteristics and rules of students' home study through online teaching is the second challenge that school education faces when implementing "School's Out, But Class's On".

Challenges to Student Learning Styles

In the new round of China's basic education curriculum reform, promoting the development of students' innovative consciousness and practical ability through independent, cooperative, and inquiry learning methods has become one of the cores of curriculum reform. But all these are done under the guidance of the teacher's organization. During the pandemic, the family became the only place for students to learn, they left regular classroom teaching, and their autonomous learning became an essential learning method for students while performing "School's Out, But Class's On". Therefore, how to improve the self-study ability and interest of students in school education according to the characteristics of students' home study, and how to change the student's learning style under the premise of respecting the law of learning, and guide them to effectively learn at home is another challenge that the school education faces.

Challenges to the Innovation of Teaching Resources

Teaching resources are materials that can be used for the effective development of teaching. The quality of teaching resources has a pivotal impact on teaching results. In traditional classroom teaching, teaching resources mainly include materials such as textbooks, learning materials, courseware, and pictures, etc., whereas online teaching resources are rarely presented in school teaching. The implementation of "School's Out, But Class's On" has made online teaching the main teaching method. Correspondingly, the presentation and content of teaching resources also changed. First, the digitization of teaching resources is necessary, that is, transforming conventional teaching resources into digital resources as much as possible. The second is the diversification of teaching content. In addition to the curriculum content stipulated in the spring semester, pandemic prevention and control, home health education, mental health, and practical activities also need to be added into the instructing contents.

Challenges to School Administration

School administration is the activity of planning, organizing, coordinating, and controlling the school's education, teaching, scientific research, logistics, and staff and students. Through administration, the school combines various tasks and its constituent elements to give play to its overall function, thereby achieving its training goals for students and various work goals (Gu, 1988). To achieve the goal of administration, the school cannot do without effective communication and coordination between administers and teachers and students. During the postponed period, since all the school administrative personnel are at home, and how can school administers coordinate various types of staff to carry out their work, and handle the relationship between the school's unified regulations and the autonomous arrangements of teachers and students is a big challenge to school administration.

School's Main Measures to Deal with "School's Out, But Class's On"

While the Ministry of Education issued the "School's Out, But Class's On" notice, it also put forward seven requirements (Ministry of Education of the People's Republic of China, 2020). Each provincial and municipal education administration department had successively put forward the requirements of their own province and city in accordance with the actual situation. Schools at all levels following the provisions of the Ministry of Education and the provincial and municipal education administrative departments, and based on their actual situation, have formed their own initiatives. After several weeks of postponement, various measures of "School's Out, But Class's On" have been continuously improved. The main initiatives that have been implemented are summarized below.

Improving Information Release, Publicity and Education

With schools as the main body, use WeChat public account and other network channels to publish "*Open Letters to All Teachers and Students of the School*", "*Open Letters to All Parents*", etc., to carry out pandemic prevention knowledge publicity, announce the relevant postponed school policies, and promote the deployment of pandemic prevention and control work, publicize the school's online teaching work during the postponed period (The Education Department of Shandong Province, 2020).

Through the WeChat public account, publish the pandemic control information of the school and the area to the staff, students and parents, so that students and parents can learn more about the severity and seriousness of the pandemic. The school's "*Pandemic Prevention and Control Guidebook*" and "*Pandemic Prevention and Control Brief News*" were issued to guide teachers and students to master pandemic prevention and control knowledge and methods to develop good hygiene habits (Zibo Municipal People's Government, 2020).

Focusing on the moral education of pandemic prevention and control, publicize role models who were on the front lines of the pandemic prevention. In this way, a

sense of overall situation and responsibility for preventing and controlling the pandemic was established. It helped students correctly judge and analyze various messages involving pandemic (The Education Department of Guangdong Province, 2020). Also, pandemic prevention works did by teachers and students were sent out every day.

Formulate the Work Plan of "School's Out, But Class's On"

According to the "*Notice on Several Issues concerning Targeted Teacher Work during the Pandemic Prevention and Control*" (Ministry of Education of the people's Republic of China, 2020), "*Notice on 'School's Out, But Class's On' Work Arrangements during the Postponed Period*" (Ministry of Education of the people's Republic of China, 2020), and "*Notice on Coordinating the Prevention and Control of COVID-19 Pandemic in Education System and Education Reform and Development*" (Ministry of Education of the people's Republic of China, 2020) issued by the Ministry of Education, all schools across the country have studied and worked out their own work plans. The content of the plan includes two major aspects, one is the work of pandemic prevention and control, and the other is the education and teaching work carried out using the Internet platform. These two aspects are essential to complement each other. Simply focusing on pandemic prevention and control without carrying out education and teaching has abandoned the school's basic responsibility; but only focusing on education and teaching without on pandemic prevention and control is a disregard for the physical and mental health of all teachers and students. So, a complete "School's Out, But Class's On" work plan must include both aspects of pandemic prevention and control and online education and teaching. Here are two typical cases that show the contents of the "School's Out, But Class's On" in their work plans via presenting both Tongshan University Road Experimental School in Xuzhou City, Jiangsu Province and Tangquan Middle School in Pukou District, Nanjing City in Jiangsu Province as examples.

On January 30, 2020, the University Road Experimental School in Tongshan District, Xuzhou City, Jiangsu Province issued a "*Notice on Strengthening Pandemic Prevention and Control Measures*" via WeChat public account (Xuzhou University Road Experimental School, 2020). They announced the school's pandemic prevention and control work plan to all staff, students and parents. The work plan includes the establishment of a pandemic prevention and control work leading group and a special working group; strictly implement closed campus management and cancel all collective activities; establish a registration and inspection schedule for all teachers and students to fully follow their movement; strengthen the timely reporting of information, and clarify the specific person to report pandemic defense and control information; all teachers, students and parents do not arrange activities such as gatherings, visiting relatives and friends, and perform self-isolation at home.

The work plan of Tangquan Middle School in Pukou District, Nanjing City, Jiangsu Province, divided "School's Out, But Class's On" into multiple stages (Dai & Lin, 2020). Each stage has specific requirements for technical support, student learning, teacher instructing, learning schedules, teaching content, learning resources, and home-

school co-education. The specific education and teaching requirements for studying subjects such as Chinese, mathematics, English, science, ethics and law, arts, as well as activities such as online theme learning, project-based learning, and housework were clearly defined in sections. Through the overall planning, guidance, inspection and evaluation, the implementation of the plan was guaranteed.

Provide Technical Support for "School's Out, But Class's On"

All school education and teaching work during "School's Out, But Class's On" requires network operation. Therefore, the Ministry of Education issued the "*Notice on Supporting Education and Teaching Work with Informationization during the Pandemic Prevention and Control Period*" on February 6th, 2020 (Ministry of Education of the People's Republic of China, 2020), to support the implementation of online teaching during the postponed period. The Ministry of Education organized the China Education and Research Network (CERNET) and telecommunications operation companies such as China Mobile, China Telecom, China Unicom, and China Satcom, etc. to strengthen the protection of national and local education public service platforms and various types of school networks. This provided fast and stable online services for schools in various regions to carry out online teaching, and help teachers, students and parents to obtain digital education resources. The Ministry of Education also required schools in all regions to rely on the national digital education public service system and various educational reform service platforms such to smooth the application of online learning spaces, and actively support school education and teaching activities including issuing notices, organizing online teaching, carrying out home-school coordination and tutoring students' learning.

Select Appropriate Education Resources

In order to support the implementation of "School's Out, But Class's On" in various schools, the Ministry of Education opened the national elementary and middle school network cloud platform (website: www.ykt.eduyun.cn). This teaching resource includes courses from the first grade of elementary school to the third grade of high school. Besides, a dedicated TV Channel-China Education TV Channel 4 was launched to cover the remote rural areas of the country with limited television signal. The Ministry of Education also organized some provincial-level education departments and elementary and middle schools to open online learning platforms to the country free of charge and provide electronic versions of relevant teaching materials for free. For example, the People's Education Publishing House has freely opened the digital teaching resource library of "People's Education Click Reading" to all (Ministry of Education of the People's Republic of China, 2020). Taking Henan Province as an example, the digital textbook service platform was free for all elementary and middle school students in the province. They launched a total of 154 digital textbooks that planed for 2020 spring semester and tens of thousands of supporting resources, which basically achieved full coverage of disciplines and semesters. The coverage rate was over 95%. In addition to providing

"digital teaching materials", the elementary and middle school digital teaching materials service platform also provided teachers and students with traditional cultural videos, book resources, and "one teacher for one excellent class" teaching case video resources (The Education Department of Henan Province, 2020).

Based on the rich education and teaching resources provided by the Ministry of Education and the provincial education department, school had studied and selected the most appropriate teaching platform and continuously optimized it to meet their technology and teaching foundation. Some schools divided resources into four types: live broadcasting resources, learning product resources, self-produced resources, and subject technology tools according to online teaching needs, to maximize the role of various resources in online teaching. For rural schools, the level of teachers and technology is limited, and the network of student families cannot fully realize platform online learning. Therefore, the school's online education is mainly carried out through mobile phones and the recorded online resources. Schools arranged online assignments and organized examinations to support "School's Out, But Class's On" to varying degrees.

As most schools in China have basically realized the requirements for the construction of education information infrastructure, and established a school education platform or resource library. This also enables these schools to rely on the existing teaching platform to strengthen the guidance of students' online learning resources when they launch "School's Out, But Class's On". At the same time, according to the characteristics of online learning and disciplines, we have carefully studied and provided curriculum resources suitable for students' online learning, and developed school-based teaching and learning resources such as digital protocol-guided learning that are suitable for students' learning (Xia, 2020).

Strengthen the Guidance and Management of Teachers

Facing the work of "School's Out, But Class's On", an important factor is the teaching ability of teachers. As early as the beginning of "School's Out, But Class's On" since it was launched on February 10th, 2020, the Ministry of Education requested in relevant documents that schools across the country should improve teachers' information technology capabilities and open and share teacher training resources. It also required each institution that undertakes national teacher training and provincial teacher training projects to organize online special training for teachers' long-distance teaching and information technology, and to provide free consultation and online guidance; at the same time, it required the provincial and municipal education departments to implement relevant supporting measures to strengthen the training of teachers' informatization ability to provide support and guarantee for teachers to carry out online education and teaching scientifically and efficiently (Ministry of Education of the People's Republic of China, 2020).

The teaching and research departments of the provinces across the country organized teams of teaching and researching staff to deeply study the rules and characteristics of online teaching, and actively explored both online and offline teaching modes

and methods. They have carried out online collective lesson preparation, online listening and assessment, and other measures to serve the school's online teaching work, and urged schools to avoid online teaching by directly copying offline classroom teaching methods, duration and teaching arrangements (Shandong Provincial Institute of Education Sciences, 2020). The education departments of various provinces and cities have launched advanced teachers, subject leading teachers, and famous teachers to guide schools to formulate online teaching plans scientifically, record live broadcasting demonstration lessons, research and develop excellent curriculum resources, and guide teachers to focus on online course preparation and teaching (The Education Department of Shandong Province, 2020).

In order to make teachers' guidance and management accurately and precisely, after two weeks of online teaching in elementary and middle schools, the teaching department summed up the problems in online teaching in time, and focused the teachers on the needs of the online teaching matter. This includes:

(1) How to carry out online teaching to promote better home study for students?
(2) What should be the difference between the teaching schedule of online teaching and the regular school teaching?
(3) What kind of online teaching content is more suitable for students to learn?
(4) How to adopt a suitable form of online teaching?
(5) What aspects should be paid attention to in preparing for online teaching?
(6) What methods can promote teacher-student interaction?
(7) How can online teaching promote the improvement of students' autonomous learning ability?
(8) How to help the graduating class review for the exam?
(9) How to arrange and correct assignments, carry out Q & A and feedback?
(10) How to develop school-based teaching and research for online teaching? (The Education Department of Zhejiang Province, 2020).

Pay Attention to Students' Learning Status

In order to adapt to the characteristics of students' home study, when the school organized and conducted online teaching, it paid close attention to the student's learning status and guided students to have better home study. During the home study, teachers' instructing time is reduced. Teachers stimulated students' motivation by giving students clear learning goals, and designed essential autonomous learning tasks based on the core content of teaching to increase students' participation in online learning. The school organized teachers to select high-quality learning resources to closely follow the teaching goals and content, meet the physical and mental characteristics of learners, promote effective but avoid inefficient learning. Instruct students to choose reasonable learning methods and use home learning opportunities brought by pandemic to cultivate students' good self-study habits and improve self-study quality and ability. We value students' practice, understand the teaching effect in time through practice, and then strengthen the learning effect and adjust their learning plans in a more focused manner.

Stimulate learning through instant evaluation, strengthen successful experiences and self-confidence, and encourage them to participate in the learning process to meet the most basic learning requirements.

In the process of organizing online teaching, we need to always pay attention to motivate students' learning motivation and cultivate self-learning ability and level. Empirical research by Zhou et al. showed that students' learning motivation was highly correlated with autonomous learning and academic achievements (Zhou & Li, 2020). In addition, we must focus on the students' experience on the network platform. Relevant research during the postponed period showed that the platform satisfaction used by online teaching had a high correlation with the overall satisfaction of students with online teaching, that is, the more satisfied students were with the online teaching platform, the more satisfied they were with the overall online teaching (Zhejiang Research Institute of Education Science, 2020).

During the "School's Out, But Class's On", schools must ensure that students from families with limited resources can participate in online teaching. It is necessary to carry out comprehensive investigations, find out the bases of students in difficult families, and understand the actual difficulties of students, including any necessary hardware such as smart phones and computers? Does his family have access to the network? Are they familiar with the use of smart devices? The school has extensively mobilized social forces to solve students' difficulties so that they can smoothly participate in online teaching activities.

Close Communication between School and Parents

During the postponed period, the family became the only place for students to study at home. Strengthening communication and cooperation between schools and families is an important measure to promote "School's Out, But Class's On".

In order to better manage students' home study, schools organized homeroom teachers to establish corresponding class platforms for communication management. Establish contact with students' families through multiple channels such as class QQ group, WeChat group or school platform, and school official WeChat. Build up a good, positive, smooth, and effective communication channel between the school and the family to maximize parental support and cooperation. Through the communication platform and collect the data of online viewing and homework submission to better understand their self study situation.

The school developed guidance for parents, and guided parents and students to make home study and living plans together, so that each student's home study and living plan could be formulated according to their home study characteristics and family circumstances, and realized "one student for one case". During the postponed period, students were living at home and their parents spent more time with their children together. Schools should help parents establish a sense of family education, help them create a good family learning environment, and ensure that students' home study pro-

grams were put in place through the guidance and supervision of both schools and families.

It is necessary to establish a school notification system to parents. The school held an online parental conference once a week, during which the school informed parents of the home study situation, including statistics of home study time, the use of e-learning tools, parental accompaniment, student learning status at each period, and homework completion. At the same time, school informed parents of the online teaching situation of teachers, including the preparation of lessons and teaching seminars. Put forward requirements for students' home study, ask parents to urge students to make a weekly study plan, arrange daily learning activities, and cultivate good study habits. Told them the expectations for parents, and hoped that parents could serve as role models, guide and supervise students "School's Out, But Class's On", and go along with their children through every day of the postponed spring semester.

Pay Attention to the Physical and Mental Health of Students during Home Study

When the Ministry of Education began to deploy "School's Out, But Class's On", it already paid attention to the physical and mental health of students during the pandemic prevention and control. It required elementary and middle schools to take care of the physical and mental health of students in the process of conducting online teaching and to control the appropriate amount of teaching content and the appropriate teaching time (Ministry of Education of the People's Republic of China, 2020).

In order to guide the school to promote the overall development of physical and mental health during students' home study, the Jiangsu Provincial Department of Education specially issued documents to schools to put forward specific suggestions on promoting the development of students' physical and mental health:

(1) Maintain healthy living habits. It required a reasonable arrangement of study time (< 3 hours per day for lower graders and < 4 hours for upper graders for elementary students; < 6 hours for middle school students and < 7 hours for high school students); sufficient sleep time (elementary school students > 10 hours, and middle school students should be > 9 hours); avoid staying up late and develop good habits to work on time; increase the interval between study and rest, take appropriate physical exercise to ensure physical and mental health; and learn to master the basic skills to prevent infectious diseases.

(2) Carry out physical exercise at home. Instruct parents to exercise with students. Its content was mainly based on basic skills (strength, flexibility, etc.), basic activities (such as jumping, supporting, balancing, etc.), and basic movements of some items (aerobics, hula hoop, jumping rope, etc.). Arrange 2 to 3 time a day with 20-30 minutes each.

(3) Insist on prevention and control of myopia, and control the length of time of using eyes. In elementary school, each class does not exceed 20 minutes, and the total length of online lessons per day does not exceed 80 minutes. Each

middle school and high school class should less than 30 minutes each, and the total length of online lessons per day should not exceed 3 hours and 4 hours, respectively. The break time is not less than 15 minutes (looking for 10 minutes in the distance, rest with eyes closed, or do vision exercises for 5 minutes).

(4) Enrich cultural life at home. When choosing educational resources, the school should pay attention to recommending the content of art appreciation, film appreciation, calligraphy writing, sports and fitness to students. Guide them to take the theme of "fighting against pandemic", and carry out thematic activities such as film and television production, learning to sing songs, home sports, housework, and research projects (Education Department of Jiangsu, 2020).

The Practical Significance of "School's Out, But Class's On"

"School's Out, But Class's On" is the world's largest online school education practice. The postponement of the 2020 spring semester due to the COVID-19 pandemic has enabled 270 million students and nearly 20,000 full-time teachers across China to conduct online education and teaching activities. This is the pioneering work of online education in China and even around the world (Zhou, et al., 2020). Meanwhile, in the process of "School's Out, But Class's On", each school formulated specific work plans, schedules for curriculum, and clarified the distance teaching and assessment process. This allowed elementary and middle school students across the country to study at home according to the study schedule every day, and the school evaluated the students according to the planed teaching stage. This educational practice solved the problem of the actual education and teaching of Chinese schools that were postponed for the purpose of preventing and controlling the pandemic, and ensured that all students' learning was not affected by the pandemic, and its implementation effect had been recognized by the majority of students. A survey conducted by the China Education Policy Research Institute of Beijing Normal University showed that the satisfaction of home and elementary school students was generally high, and the vast majority of students acknowledged online learning methods and the learning effects (Jing & Zhang, 2020).

"School's Out, But Class's On" education practice has tested the achievements of China's education construction of informatization. Since the 1980s, China has been continuing to promote the construction of education informatization with "three links and two platforms" as its core, and completed the project of "full coverage of digital education resources at teaching sites", which has enabled China to include teaching sites in remote rural areas with modern teaching equipment and nationally prescribed curriculum resources. Up to 2019, 98.4% of China's elementary and middle schools (including teaching sites) have achieved network access. The national education resource public service system has been connected to 150 online platforms. In addition, there are Tencent classrooms, NetEase public courses, Chinese university MOOC,

Homework Help, Learn+Think Online School, Ape tutoring, VIPKID and other educational platforms. Based on the construction of online platforms, China has also vigorously promoted the construction of high-quality digital education resources, including online courses, media material resources, and digital learning resource centers (Zhou, et al., 2020). These national-level online course resources provided strong educational technology and resource support for "School's Out, But Class's On" during the pandemic, thereby making it possible for schools across the country to develop online education and teaching.

"School's Out, But Class's On" educational practice is of great significance to the use of information technology to promote education and teaching reform. Online learning breaks the limitation of time and space and the limitation of the source flow of offline teaching, and makes a full use of the advantages of modern education technology. In online teaching, teachers use cutting-edge Internet technology to restore real teaching situations, and use massive electronic teaching resources to enrich teaching content, thereby achieving a rich, practical, and interesting live teaching. Students use the Internet to make learning choices more diverse and personalized, to make learning content and activities more free, and to make information technology and teaching more closely. Online teaching is considered to be an essential part of the future teaching mode, but since its rise in 2013, online learning has not become one of the popular teaching forms. The successful practice of "School's Out, But Class's On" provided valuable experience for the further implementation of online education, enriched people's understanding of online education, and increased the stickiness between technology and education. It is foreseeable that after the resumption of the normal school, the use of the Internet for autonomous learning and after-school supplementary learning will become a crucial way for students. Online teaching through the Internet will also become a critical style of teacher instructing. Using the network for teaching administration will also become an important form of school management (Zhou, et al., 2020).

"School's Out, But Class's On" is an educational response to the COVID-19 pandemic, but this should not be taken as a passive move under the crisis. On the contrary, we should combine the long-term task of reforming learning and teaching models in times of crisis to make it a good opportunity for school education reform. Schools should take advantage of this rare practical opportunity to re-examine the mission of school education in the spirit of reform, further consider the high-quality construction of educational resources, and the reconstruction of educational models and forms, and explore new types of education and teaching models.

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ORIGINAL ARTICLE

What Role Should Teachers Play in Online Teaching during the COVID-19 Pandemic? Evidence from China

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***Abstract**: After the outbreak of the COVID-19 pandemic, China implemented the largest online education practice in human history. In the process, different teaching models coexist. Through a quasi-natural experiment, a total of 1,024 samples from Guiyang No.8 Middle School and another comparable school with the same conditions and students were enrolled for analysis, we discussed the impact of two online teaching methods, recorded video versus live broadcasting, on student performance, and the role teachers should play in online teaching. The study found that, compared with the self-study-based recorded video teaching, live broadcasting teaching with more teacher-student interaction is a more conducive to improving students' academic performance. In the process of online teaching, teachers should not only assume the role of transmitting knowledge, but also play the role of "leader" and "accompanier" through effective guidance and communication.*

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Question

TEACHERS play an important role in the teaching process. In John Hattie's famous book "Visible learning: A synthesis of over 800 meta-analysis relating to achievement" (2009), the author analyzed the influence of teachers on academic performance. He found that teachers' teaching strategies and methods have a significant impact on student performance. Among them, the interactive teaching method has the largest impact on performance among all other teaching strategies, with an effect size of 0.74. In the teaching process, teachers' timely feedback and formative evaluation provided the greatest impact on the academic output, with effect size of 0.73 and 0.90, respectively. The academic community attaches great importance to students' autonomous learning, whereas Haiti's analysis showed that self-controlled learning by students themselves may not be an effective way to improve academic output, and its effect size was only 0.04.

Hattie's study did not discuss at length the impact of teacher behavior on academic performance under online teaching conditions. In recent years, cumulating evidence showed that online teaching had convincing role in improving students' performance. Cheng et al. (2019) conducted a systematic review and meta-analysis of the published data and found that almost all the use of technology plays a role in improving students' academic achievement. Compared with students who do not use technology or use traditional teaching methods, the use of technology could help students improve their academic performance by 15.5 percentage points. Other studies have found that the use of information technology could also improve student performance, as well as help reduce inequality in education (Fang, et al., 2019; Tian, et al., 2020). Currently, most of these studies used technology as a booster for the transformation of the teaching from the "teacher-centered" to the "student-centered" process. Of this, teachers could use information technology to help students improve their academic output via giving students more autonomy in learning to achieve the transition from "leaders" to "helpers" of learning (Tian, 2018).

So, can technology further play an independent role, or even replace teachers to achieve students' completely autonomous learning? With the advent of online teaching formats such as MOOC, such assumptions are no longer unlikely like Arabian nights. Even some more radical views believe that in the future, with the help of artificial intelligence, virtual teachers can replace most of the roles of offline teachers do (Yu, 2018).

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Zhou et al. (2018) used large-scale academic monitoring data and found that the teacher-student relationship is the most essential factor that affects student performance. This means that technology is playing an increasing role, but the effective communication between teachers and students face-to-face is still indispensable and is a critical link for students' learning process.

But to date, most of the research on this issue has been carried out only in the presence of teachers. It is not clear whether technology plays a role of "replacement" or "reinforcement" for teachers. Furthermore, we have no way to know what role teachers should use to get into student's learning process with the help of technology if teachers are completely "absent"? However, it is difficult to get a complete answer to this question because the "absence" of the teacher cannot be realized in a normal course of teaching.

The sudden outbreak of COVID-19 at the end of 2019 forced schools to close. The Chinese government has adopted the "School's Out, But Class's On" approach, i.e. "suspending classes without stopping learning", to provide online learning tutoring for students at home. This largest online teaching activity in human history has made tens of millions of teachers and students have to complete the conversion from offline teaching to online teaching overnight. Teachers and students no longer meet each other as usual. Regardless of whether or not they are willing, teachers have to quickly adapt to this change in teaching methods and switch the accompanying role. Such a large-scale online teaching practice provides us with a good opportunity to explore the above-mentioned issues. We can use this to examine how teachers and technology should be combined under online teaching conditions. In other words, what role should teachers play in order to better achieve the teaching goals and improve students' academic performance? We will explore this through a quasi-experiment.

Study Design

Experiment Objective

The main purpose of our research is to investigate the ways in which teachers organize teaching under online teaching conditions to better improve student performance. During the COVID-19 pandemic, all schools in China adopted online teaching methods, but the methods adopted by different schools were different. Generally, there are two basic online teaching modes. One mode is "Recorded Video", from which the teacher recorded the class contents in advance and the students watched them online themselves. During this process, there was no online communication between teachers and students, and the delivery of contents was single direction. Students totally relied on self-study to complete learning tasks. In this case, teachers were more likely to assume the role of content providers. The other mode is "Live Broadcasting", through which teachers use teaching software to teach online. During teaching, the real-time interaction and communication with students was realized. Students could complete learning tasks with the guidance and assistance of their teachers. In this way, the teacher still plays the role of a

student's learning guide or even a leader; and the immediate teacher-student interaction enabled the teacher to play the role of "accompany" in the learning process. We hereto compare the effect of these two teaching modes on student performance to analyze what role teachers' play in online teaching, which will help improve the teaching efficiency and student performance.

Experimental and Control Groups

In this study, the live broadcasting mode in which teachers were more involved in learning was used as an intervention variable to set the experimental group and compare the teaching effect with the Recorded Video mode. For this reason, we chose Guiyang No.8 Middle School and another comparable school with the same teaching conditions and students as the experimental subjects. These two middle schools are all high schools in Guiyang City, and the school's running conditions, teachers, and student resources are relatively close. In the experimental course, after matching, we took samples of senior students from the two schools to make the results of the students in the two schools comparable. By comparing the differences in teaching effectiveness between the two schools during the pandemic, we could determine which form of online teaching is more conducive to improving student performance. Among them, Guiyang No.8 Middle School mainly used Live Broadcasting to organize teaching during the pandemic, and it was set as an experimental group; another school with the same school conditions and student sources mainly used Recorded Video to organize teaching, which was set as the control group. During the pandemic, the content, progress, and prior and posterior testing tools of the two schools were consistent, thereby ensuring that the experimental results were comparable. A total of 1,024 student samples were enrolled from both schools. Since China senior high school students are taught in literal and science classes separately, so we divided the total samples into two sub-groups: literal and science. Among them, there were 209 in the literal experimental group and 221 in the control group; 294 in the science experimental group and 300 in the control group.

Experimental Process

During the pandemic, Guiyang No. 8 Middle School and another peer school complied with the requirements of the Chinese Ministry of Education for "School's Out, But Class's On" and the unified deployment of the Guiyang Education Bureau. Since February 3, 2020, online teaching has been implemented totally. By mid-March, 2020, Guiyang's epidemic prevention and control had achieved remarkable progress, and social life gradually returned to normal. The school resumed on March 16th, 2020, and so the 6-week online teaching and e-learning was over. The students returned to school and switched to the normal offline teaching.

During the online teaching, the experimental group and the control school implemented teaching according to a unified schedule. However, the experimental group, Guiyang No. 8 Middle School, was mainly based on live broadcasting, supplemented by a small amount of recorded video. Live broadcasting accounts for more than 70% of the

total teaching time. The peer school in the control group mainly used the recorded videos that are available on various teaching platforms or recorded by the teachers of the school, supplemented by a small amount of live Q & A, so the recorded video accounted for more than 80% of the total teaching time. After the beginning and end of the experiment, both groups performed prior test (pretest) and posterior test (post-test), and the tests were standardized uniformly.

Results and Discussion

Pretest Results

The test results of the experimental group and the control group are shown in **Table 1**. Table 1 presents the results of the mean, standard deviation, and independent sample t test. The results showed that, except for the Chinese language scores of the science samples, the average and total test scores of the subjects in the experimental group were lower than those in the control group; however, the results of the independent sample t test showed that the difference was not significant ($p > 0.05$). This shows that the experimental conditions were good, and it was possible to more accurately analyze the impact of teachers in the experimental group that showed more involvement in online teaching through analyzing the post-test results.

Post-Test Results

The post-test results in **Table 2** show that after 6 weeks of online teaching, the experimental group surpassed the peer control group in both the total and the average scores in each subject. This shows that the online teaching in the experimental group had achieved better results, and the students in the experimental group had made greater academic progress during the pandemic. The difference in performance between the two groups changed from insignificant at the beginning to significant at the end of the study ($p < 0.001$).

Discussion of the Results

In fact, due to the urgency of the epidemic, when online teaching was implemented, although each school made a lot of preliminary preparations, because this was an unprecedented exploration, teachers and students had never been in such a long time to solve teaching problems online. Therefore, it was not clear what kind of teaching mode would be used to improve teaching efficiency. It should be said that for most schools in China, the online teaching activities carried out during the pandemic were of a certain experimental nature.

Because of this, in this online teaching practice in China, various forms of teaching have appeared. As mentioned earlier, live broadcasting and recorded video were the two most common modes. In recent years, due to the rapid development of online education resources and technology, various views on the role of teachers had

Table 1. Means, Standard Deviations, and Independent Sample *t* Test Results.

Sub-Sample	Subject	Sample Size		Mean		SD		*t*	*p*	*Cohen's d*
		Exp.	Ctrl.	Exp.	Ctrl.	Exp.	Ctrl.			
Literal	Chinese	209	221	74.785	78.009	41.618	38.054	-0.839	0.402	-0.081
	Math.			51.297	55.955	33.620	33.371	-1.441	0.150	-0.139
	English			74.726	80.507	43.768	42.563	-1.388	0.166	-0.134
	Total			200.808	214.471	114.845	109.479	-1.263	0.207	-0.122
Science	Chinese	294	300	89.364	87.227	21.634	27.088	1.061	0.289	0.087
	Math.			64.561	64.867	24.238	30.904	-0.134	0.894	-0.011
	English			90.815	92.712	24.836	32.037	-0.805	0.421	-0.066
	Total			244.740	244.805	59.871	81.810	-0.011	0.991	-0.001

Note: Math: Mathematics; Exp.: Experimental Group; Ctrl.: Control Group; SD: Standard Deviation.

been put forward in the information age. The substantive difference behind the two online teaching modes examined in this study was the difference of teachers' roles. Compared with recorded video, the relationship between teachers and students in the live broadcasting was much closer to the traditional way, and the only difference was the delivered knowledge lies in different means of technology.

Our experimental results showed that in the current online teaching process, more teachers' involvement is an effective way to improve teaching efficiency. From the calculation results in **Tables 1** and **2**, compared with the control group in which students had greater autonomy, the experimental group had more explaining and giving feedback online in time, which may be the main reason that leads to higher performance. This result also showed that although the development of information technology provides students with greater space and resources for autonomous learning, teachers' teaching and feedback still play a critical role. From this perspective, in online teaching, it is not enough for teachers to play the role of knowledge or resource providers, like offline courses, teachers also play a role as a mentor and a companion.

Conclusions and Implications

In response to the problems in online education during the COVID-19 pandemic, we based on a sample of 1,024 students from Guiyang No. 8 Middle School and another peer comparable school with the same school conditions and students. Through this 6-week quasi-experiment, we found that:

Table 2. Means, Standard Deviations of Post-test Results, and Independent Sample *t* Test Results.

Sub-Sample	Subject	Sample Size		Mean		SD		*t*	*P*	*Cohen's d*
		Exp.	Ctrl.	Exp.	Ctrl.	Exp.	Ctrl.			
Literal	Chinese	209	221	89.617	78.719	26.421	34.260	3.679	0.000	0.355
	Mathematics			76.785	66.294	23.793	31.620	3.871	0.000	0.374
	English			105.242	94.333	23.349	35.458	3.746	0.000	0.361
	Total			271.644	239.346	57.185	91.720	4.353	0.000	0.420
Science	Chinese	294	300	92.585	85.450	14.600	28.797	3.797	0.000	0.312
	Mathematics			77.124	69.413	19.270	30.458	3.679	0.000	0.302
	English			102.182	94.690	24.722	32.042	3.186	0.002	0.262
	Total			271.891	249.553	44.641	82.655	4.086	0.000	0.355

Note: Exp.: Experimental Group; Ctrl.: Control Group; SD: Standard Deviation.

First, in the current online teaching process, simply providing teaching resources is not enough. Taking more live broadcasts to form more teacher-student communication and instant feedback is an effective way to improve student performance. Second, for teachers, in the process of online teaching, more attention and feedback should be given to students to form an effective online communication mechanism. Only in this way can we achieve the teaching goals more efficiently.

Our findings apply not only to online teaching during the pandemic, but also to offline teaching. Under the condition that the experimental group and the control group are basically the same in all aspects, the most crucial factor for the difference in student academic performance is the difference between the teacher and student communication of the two groups during the online process. This further enlightens us on how to build a good teacher-student relationship, form a smooth teacher-student communication, and enable teachers to truly assume the role as a mentor and a companion, which is the real key to the effective teaching.

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The Global Crisis Brought about by SARS-CoV-2 and Its Impacts on Education: An Overview of the Portuguese Panorama

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***Abstract**: The emergence of CIVID-19 caused by the SARS-CoV-2 virus at the end of 2019 changed the face of the world. Deep consequences are being felt across the whole world at all levels. This opinion piece aims to provide a picture of the Portuguese educational scenario, specifically the impact of COVID 19 in education and government measures to mitigate it, the hindrances and the challenges ahead.*

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Introduction

WHEN the novel coronavirus (Severe Acute Respiratory Syndrome Coronavirus 2, SARS-CoV-2) first emerged in December 2019, the world was not prepared for what came right after. The virus quickly spread to Europe and, in a few weeks, strayed into a planetary scale. The world realized that this deadly virus was unlike others of the kind, which only attacked distant and underdeveloped countries with a poor health system. Now the whole world was facing an enemy that hit almost all countries worldwide, with different degrees of intensity, showing no country was safe, regardless the strength of their economy or the development of their healthcare system. Governments quickly put in place measures that sought to prevent COVID-19 from spreading, but in a few weeks, the number of infected citizens and the death toll was daunting.

Thus, the world had to quickly adapt to this reality, as this scenario is expected to remain dynamic (Abajo, 2020). Supra-national entities such as the World Health Organization (WHO) – that declared a state of pandemic (Teles, 2020), the United Nations (UN) and, at the European level, the European Union, as well as national governments, swiftly took severe measures that aimed to contain the spread of the virus. Yet, the face of the planet changed almost overnight, as – borrowing a phrase from a popular band – it was the end of the world as we knew it. While the changes traverse the whole spectrum of society, in the economic, societal, environmental and other spheres, the focus of this opinion piece is the educational arena in Portugal, notably the changes that took and are taking place; the strategies put in place the hindrances and the opportunities that are emerging with this shift in the educational paradigm.

Methods

The methodology used in this opinion piece consisted of a collection and analysis of publications and other documents that directly focus on this topic. Furthermore, the authors consulted Portuguese By-Laws and other legal documents, as well as informative websites on this very current problem.

COVID-19: Some Notes

The last global pandemic that the world has witnessed was the Spanish flu, caused by the influenza virus H1N1 from January 1918 to December 1920. This pandemic infected around 500 million people and claimed the lives of between 50 and 100 million people across the planet, which made it one of the deadliest pandemics in human history. After this pandemic, others broke out, such as H5N1, H1N1, Ebola, MERS-CoV and, more recently, the Zika virus, but with far fewer casualties than the Spanish flu.

Currently, the planet is experiencing a similar pandemic, caused by the SARS-CoV-2 virus. Since its first emergence, it rapidly spread to Europe, with Italy being the first severely hit country (where the death toll is already higher than in China), followed by Spain, the UK, France, Germany and a bit all European countries. Countries in the

North and South American continent have also been hit by the virus. As of 11 March 2020, the date when WHO's Director-General declared COVID-19 a global pandemic, almost 120,000 cases of COVID-19 were reported worldwide by more than 100 countries. As of 25 March 2020, ECDC (2020a, online) reported 416,916 cases of COVID-19, including 18,565 deaths. This is indicative that this virus is highly contagious, spreading rapidly through contaminated objects (e.g., elevator buttons or restroom taps) or virus aerosolization in a confined public space (e.g., restrooms or elevators). Furthermore, although a vaccine is being developed in several countries, there is a significant time frame between its creation, development, testing and mass production, and its use by the population at the global scale. For the time being, neither vaccine nor strong evidence on the effectiveness of potential therapeutic agents is available (ECDC, 2020b, online). Thus, other measures have been put in place by many countries to mitigate the impact of the epidemic: social distancing measures (notably, the immediate isolation of symptomatic persons, the suspension of mass gatherings, social distancing measures at workplaces and measures in and closure of schools); ensuring the public is aware of the seriousness of COVID-19; prevention and control of COVID-19 in hospitals and long-term care facilities; the training for all staff of healthcare facilities; rational approaches to limited resources; and surveillance systems for detecting cases and assessing community transmission (ECDC, 2020b, online).

The Portuguese Reality

Current Situation

As of March 26, 2020, Portugal recorded 3,544 citizens infected, 22,257 under assessment and 60 deaths. The North of the country (with 1,858 positive cases and 28 casualties) and the region of the capital, Lisbon (1,082 positive cases and 18 casualties), were the most affected by the disease (DGS, 2020a, online). The Portuguese government swiftly put in place measures and a national plan to prepare for the epidemic and respond to it as effectively as possible (DGS, 2020b, online). This pandemic will certainly (and, in some cases, already is) have a profound impact in all contexts, namely the societal, economic and environmental ones. However, the focus of this work is the educational arena and the changes underway in Portugal. This is addressed next.

The Impact of COVID 19 in Education and Government Measures to Mitigate It

Portugal learnt from the unfortunate experience of other European countries, especially Italy, and shut down all educational institutions, from pre-school to higher education, on March 13, 2020. Before that, several higher education institutions (HEIs) had closed their campuses due to the emergence of coronavirus, which infected members of the academic community. Classroom classes were suspended, as well as live student tutorial support. These activities started being developed via the Internet, and HEIs used their specific internet platforms (e.g., Moodle) or other online tools, such as Zoom, for ex-

ample, and e-learning became the only possible formal learning overnight. At the remaining educational levels, the government created a website where several online tools are provided to teachers (e.g. Simple Scripts, Colrd, Inkscape and Sketchpad, just to name a few (Portuguese Republic, 2020a, online). Furthermore, teachers also use the e-mail to send students exercises, which they complete and return also by e-mail. In many schools, students carry out online tests and livestream the presentations of the exercises they prepare at home. With these measures put in place, the Portuguese Ministry of Education seeks to ensure that the regular school year and student learning are not jeopardized or, at least, the negative consequences of schools' shutdown are mitigated (Portuguese Republic, 2020, online).

The Hindrances

Portugal has been preparing its population to the technologic advancements. The government's major strategy encompasses the Portugal EnCoDe.2030 programme, whose main goal (and, simultaneously, challenge) is to train and qualify the Portuguese population in digital competences (Portuguese Republic, 2020b, online). Yet, this project is rather recent and much has still to be done in technologic and digital terms. Only 71.5% of Portuguese households have a computer with Internet and broadband Internet connection, that is, one in four Portuguese citizens does not have a computer at home (PORDATA, 2020, online). With the government and schools assuming that all students (and teachers, for that matter) have access to a computer with an Internet connection, this may be a serious hurdle, even more so because the country is on complete lockdown as of March 18, 2020 (Decree no. 2-A/2020) and students/teachers cannot leave their homes to go to a library, for instance.

The reality of the conditions, both in terms of lack of training and competences and technical equipment on the part of teachers – which, ultimately, entails that they have to buy the necessary equipment with their money – and also the lack of a technical structure at the national level that allows such a large number of people in simultaneous online connection, seems not to be the most conducive to successful distance learning. The same applies to students, given that, in general, the most disadvantaged are those who need more monitoring. An example taken from a March 26, 2020 news story is illustrative of this reality:

> *"Teachers are getting exhausted, after more than a week of distance classes due to Covid-19. They had to adapt ways of teaching and even buy equipment and licenses to use online tools [...] Teachers had to reinvent ways of teaching and, for many, digital platforms were unknown ground. At least, until last week." (SIC News, 2020, online).*

Final Remarks

The portrait of Portugal and the status of education offered shows that the government worked hard and quickly to seek to overcome the potential negative effects of the SARS-CoV-2 pandemic in education at all levels. There are difficulties to face, mostly

because digital competences, computers and access to the Internet are not widespread through the Portuguese population. Some questions need to be put, and the answers to them will dictate the success or failure of this novel educational system: is the country prepared for a hypothetical shutdown of all schools extended in time? Do all students in compulsory education have access to a computer with access to the internet? Are parents prepared to support their children, encouraging them to study and monitoring their learning? Has the necessary investment been made to provide schools with adequate and safe e-learning platforms and tools? Has there been a correct teacher training plan in recent years that enables these professionals to teach in the e-learning modality, not only in terms of technological competences but also in teaching-learning strategies? Can parents stay at home to support and help their children without being having cut on their payrolls or even put their jobs at risk? These are issues that need to be carefully thought about.

However, the reality the country is experiencing brought about by the coronavirus should not be viewed as a set of hurdles, but rather as a challenge and an opportunity to change and to innovate in the educational and pedagogical field. Whether Portugal is ready to fully embrace this challenge remains to be seen.

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REPORT

Guiding Teaching Strategies with the Education Platform during the COVID-19 Epidemic: Taking Guiyang No.1 Middle School Teaching Practice as an Example

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***Abstract**: During the COVID-19 epidemic, how to use online education platforms to teach and ensure the effectiveness of home study for students is a topic of concern for many high schools. During the epidemic, Guiyang No.1 Middle School used the information management platform, based on the actual situation of the school, combined multiple resources, and rationally used the online education platform to guide and teach, which effectively guaranteed the implementation of "School's Out, But Class's On" i.e. suspending classes without stopping learning. Based on the practical exploration of Guiyang No.1 Middle School, we explored the strategies of using educational platforms to guide teaching during the epidemic.*

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WITH the rapid development of information technology, the Internet, cloud computing, big data, Internet of Things, artificial intelligence and other technologies have been widely used in education. The multiplication function of the cross integration of information technology and education is having an epoch-making impact on education.

Affected by the COVID-19 epidemic, normal classroom teaching could not be carried out. Schools move teaching from offline to online, and teachers use the Internet to carry out online teaching. How to use the online platform for online teaching, especially the senior high school students who are about to face the college entrance examination is particularly important. How the school can ensure the quality of students' online learning through online teaching; at the same time, how to let students' develop physically and mentally in a comprehensive and healthy way has become a topic of common concern to everyone.

Guiyang No. 1 Middle School in Guiyang City, Guizhou Province serves as a provincial demonstration modern educational technology experimental school. The school gives full play to the existing advantages of the school, and with the help of national and local platforms and resources, it has formed an online teaching model with students as the mainstay, ensuring the quality of online learning for students, and effectively implementing "School's Out, But Class's On". We herein use the school's specific practice as an example to explore how to use online education platforms to teach during the COVID-19 epidemic to ensure students' home study strategies.

Online Education Related Concepts

Network Teaching Platform

The network teaching platform is the migration of the Internet in the field of education (Lv, et al., 2017). It is the infrastructure of future education informatization and the product of technology. It evolves with the development of technology. It includes all the hardware computing resources required for educational informatization. After these resources are virtualized, they can provide a good platform for educational institutions, education practitioners and students. The role of the platform is to provide cloud services for the education field (Zhang & Tong, 2010), so that learners can learn better.

Therefore, some scholars believe that by using online education platforms, learners can participate in the construction of learning and can progress in exploration and discussion in order to achieve a multi-dimensional and comprehensive grasp of knowledge (Garrison & Terry, 1998). As long as teachers have a better understanding of students, educators can adapt online courses to learners' needs and maximize their success in online learning environments (Black, et al., 2008).

Educational Big Data

Educational big data refers to the data collection generated during the entire educational activity process and collected according to educational needs, all of which are used for

educational development and can create huge potential value. Compared with traditional education data, the collection of educational big data has stronger real-time, coherence, comprehensiveness and naturalness; its analysis and processing are more complex and diverse, and its applications are more diverse and deep (Yang, et al., 2016).

Educational big data, as the soul of intellectualization of education, aggregates and stores information assets in the field of education, and is the most important foundation for the development of intelligent education (Ke, 2013). Some people believe that big data in education will promote important changes in several aspects of education: first, the educational process will change from "non-quantified" to "quantifiable", and behavioral information of teaching and learning will be recorded more and more accurately; Second, from "experienced" to "scientific" in educational decision-making, data-driven decision-making will become more and more reliable. Third, the educational model will change from "popularization" to "personalized". Learning analysis technology will give teachers an understanding of each the ability of a "real student" to teach students according to their aptitude. Fourth, education management goes from "invisible" to "visible", through which more intuitive, accurate, and efficient education resources and business management will occur (Yang, et al., 2016).

The Basics of Schools Using Online Education Platforms for Teaching during the Epidemic

The School's Information Infrastructure is Relatively Complete

With the continuous advancement of national education informatization, schools continue to improve the informatization infrastructure. The school has established a public service platform for education resources and a public service platform for education management, and has continuously updated and optimized the campus platform to meet various needs for safe, flexible, personalized, high-speed, and high-quality information. With the technical support of educational information enterprises, it provides support and services for teaching research and management through modern technologies such as big data analysis, and achieves better integration with education and teaching.

At the same time, the school attaches great importance to the cultivation of the ability of teachers and students to apply information. The practical application of courses, projects, and seminars has promoted the construction of curriculum resources and the improvement of teachers 'and students' educational technology application capabilities.

During the COVID-19 epidemic, the school established an online teaching platform based on the school's teaching and management platform, combined with the national education platform, the education cloud platform of both Guizhou Province and Guiyang City. At the same time, the school's cultivation of the application level of

teacher-student education informatization provided a basic guarantee for online teaching during the epidemic.

Schools Actively Develop School-Based Online Teaching Resources

In the course of advancing the education informatization infrastructure, the school will fully explore the value of teachers' own curriculum resources in combination with the actual situation of the school. The school strengthens the construction of teaching courseware, teaching design, teaching materials, etc., develops and properly integrates the network teaching resources of the school, and forms a school-based network teaching resource database.

During the epidemic, the National Education Resources Public Service Platform opened a national network cloud classroom. Based on the course resources that won the ministerial award for the "one teacher for one excellent course; one lesson for one excellent teacher" project, it absorbs other high-quality online course teaching resources and provides resource support for schools to carry out online teaching. In addition, under the guidance of the Education Department of Guizhou Province, the Guiyang Education Bureau organized more than 600 outstanding teachers from 12 schools in Guiyang to record a total of more than 1,600 online courses on "Sunshine Campus • Air Guizhou Course", which is aimed at elementary and middle school students in the province.

The school organizes teachers and homeroom teachers of each class to screen the rich online teaching resources provided by the nation, provinces and cities in accordance with their own learning characteristics. Select learning resources that match the student's academic situation and guide the learning content to ensure the effectiveness of online learning.

The School Establishes a Classroom Teaching Model with Students as the Main Body

With the comprehensive progress of the national curriculum reform, schools have been insisting on the reform of teaching methods. Pay attention to the construction of classroom teaching based on student autonomous learning and group cooperative learning. During the exploration, the school gradually established an education concept aimed at the autonomous development of students. Strengthen the guidance of students' learning methods in classroom teaching. The school advocates autonomous learning, encourages autonomous learning, self-exploration, self-discovery, and self-acquisition of knowledge. Give full play to the potential of students' own development, return the classroom to the students as much as possible, and highlight the student's subjective status. Through the optimization of teaching methods, students' self-learning ability and the spirit of active inquiry had been cultivated, which provides core support for this online teaching.

Establish a More Mature Home-School Management Mechanism

For a long time, schools attach importance to home-school communication and firmly establish the correct school-family connection concept. Each class has a class QQ group and a WeChat group based on the public communication platform. Each class has formed a mature home-school management mechanism centered on the homeroom teacher and assisted by other teachers.

During the COVID-19 epidemic, each class made full use of WeChat groups, Dingding group, and QQ group, etc., providing students and parents with an effective digital management platform for communication and interaction. Through the platform, teachers can publish learning tasks online in real time and check the completion of student assignments in real time, and provide with counseling and answering questions. Students complete the learning tasks in time through the computer and mobile phones, and realize online learning and submission of homework. Parents use the platform to interact with teachers in a timely manner and maintain communication, forming a good home-school co-education model.

Measures to Use Online Platforms for Teaching during the COVID-19 Epidemic

With the help of national and local public education platforms and educational resources, the school has formed an online teaching model based on a strict teaching management system, diversified teaching forms as the core, and multiple evaluation methods as the guarantee.

A Variety of Online Teaching Modes with Live Teaching as the Mainstay

Teachers use a variety of forms such as public communication platforms (Dingding Group, WeChat Group, QQ Group), as well as cloud classes for corporate education cloud platforms, and Tencent classroom for online teaching. These diverse forms of online teaching complement each other and provide guarantee for the quality assurance of online teaching during the epidemic.

When using "Dingding" for live lessons, teachers can choose online teaching tools such as PowerPoint, Seewo whiteboard, Seewo EN5 according to their own needs and habits. After the live broadcast is completed, the teacher can arrange accurate remedial assignments based on the students' response to the class (message interaction during the live broadcast). Students complete and submit their homework during the evening self-study (19: 00-23: 00), and the relevant class teachers promptly correct and give targeted comments.

Homework Training Based on Big Data Analysis

It has become the norm in the field of education in China to instruct teachers and students through big data in education. More and more schools are using educational big data analysis platforms to achieve personalized learning for students and targeted teaching by teachers. During the COVID-19 epidemic, the school used multiple platforms to conduct online assignments and online assessments for all students.

After the student's homework or test is completed, upload it to the system platform. Teachers review student assignments and quiz on the platform and the platform automatically collects student assignments or quizzes every day. The system automatically analyzes student work or test data to provide accurate learning reports for each student. For the common problems of the students in the study report, the teacher gave a collective lecture and let the students do common exercises; for the individual problems of different students in the study report, the teacher carried out hierarchical teaching based on the student's study report and the students' cognitive level, and performed stratified training.

What is particularly commendable is that after each practice and assessment, the system will analyze the statistics of the students' practice results. Through the homework analysis, the teacher can get the grades, class common problems and personality errors of the homework each week. Common mistakes refer to most students who will make mistakes in the practice process. Personality mistakes are a few students' mistakes. For common mistakes, the system will automatically push parallel exercises, and the teacher requires all students to practice again; for personal mistakes, the system will automatically push different exercises, and the teacher will send different exercises according to the students' cognitive level. In principle, the high-level students will be provided with difficult exercises, the lower-level students will get the most basic exercise problems, and the middle-level students will be provided with middle-level difficult exercises.

Establish Strict Online Learning and Teaching Management System

Requirements for Online Teaching

There are several unifications in online teaching: unified data, unified progress, unified training, and class time. The team leader prepares an emergency team in advance. According to the progress of the second round of review, allocate resources and integrate tasks with monthly and weekly plans. The teaching and training materials, electronic documents, PowerPoint, and micro-learning vary from day to day in the unified grade online course. The grade leader arranges the class schedule for the whole year, unifies the time of each subject, and unifies the students' pace.

Strict Management of Online Teaching

- **Time Management:** The school develops class schedules for third-year online learning, and conducts student and teacher attendance checks in strict accordance with the schedules.

  Before 8:00 am, the head teacher posted a health check-in task through the public office communication platform "Dingding" to carry out student attendance; administrative management (leaders above the middle level) stationed in the "Dingding" group of each class to watch the live broadcast and conduct attendance of the subject teacher.

  From 8:00 am to 10:40 am, students conduct autonomous learning based on the learning tasks (simulated sets of papers or time-limited trainings, Chinese and English famous words or word recitations) released by teachers of various subjects in the "Dingding" class group, and are required to submit assignments according to the prescribed time.

  From 10:40 am to 12:00 pm, Chinese or mathematics teachers will conduct homework reviews or special lectures through "Dingding" live broadcast according to the progress of the second round of review and the students' homework.

  From 14:30 pm to 17:40 pm in the afternoon, teachers of English, Liberal Arts or Liberal Arts courses will be arranged for live teaching. The online teaching time for each subject is one hour.
- **Behavior Management:** Teachers and administrators manage online teaching activities through the "Dingding" platform

  Teachers use the Dingding platform to publish homework at the prescribed time (before 8:00 am) through the home-school interactive platform. According to the submission of the homework, they understand the completion of the homework and submit comments. Provide timely reminders to students who have not completed in time, and if necessary, contact the students' parents to learn about the situation.

  Administrative personnel need to know well the layout and correction of teacher assignments based on the teacher's home-school interaction platform and the operations in the corresponding class sections. The Teaching Office conducts brief reports on teachers' teaching activities every week.
- **Emotional Management:** During the epidemic prevention and control stage, teachers, students, and even parents, especially the senior high school students, may have bad emotional changes such as extreme anxiety. The school uses large and small classes to carry out epidemic prevention and control, and provides campus with hotlines of psychological counseling to help teachers, students, and parents' mental health management.

The Effectiveness of Using Online Platforms to Implement Teaching during the COVID-19 Epidemic

During the epidemic, students learn autonomously by watching videos of famous school classrooms and school micro-classes provided by the Provincial Department of Education. On the basis of students' self-directed learning, the teacher answers questions through live broadcasts online, and guides students' problems in the learning process in a timely manner, thus gradually formed a student-centered online teaching model. At the same time, the educational big data system is used to collect, statistically analyze and accurately deliver student learning data.

On the one hand, it helps teachers master the students' process learning data to effectively improve teaching. On the other hand, it frees students from the traditional problem-solving tactics, and provides personalized and accurate practice materials to help students improve the efficiency of practice and achieve the maximum practice effect in a limited practice time. Teaching and learning promote each other. This really helps the school to improve the quality of teaching, and help students improve their performance, and then achieve personalized learning for students, targeted teaching for teachers.

It is undeniable that in the process of practice, students' ability to learn independently has been tested tremendously. At the same time, teachers need time to prepare lessons online, correct and live teaching. Teachers' online teaching work is overloaded. How to ensure the needs of students and teachers on the premise of ensuring the quality of online teaching is an urgent problem to be solved in the online teaching model.

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REPORT

Strategies for Regional Mental Health Education under the Influence of the COVID-19 Epidemic: A Case Study of Nanjing, China

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***Abstract**: The outbreak of COVID-19 pneumonia severely affected the psychological health of children and produced negative effects on it. How to help children overcome the negative psychological impact caused by the epidemic is a common concern. During the epidemic, the administrative department of education in Nanjing, China actively carried out psychological health education and assistance for students. I outline the measures for developing mental health and psychological assistance in Nanjing, China.*

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IN the Spring Festival of 2020, the COVID-19 epidemic broke out and it was very aggressive. China has implemented strong prevention and control strategies. After the holidays, according to the development of the epidemic, Jiangsu Province issued guidance on February 6, 2020 to postpone the start of the school. The epidemic affects everyone's life and learning, and inevitably invades people's spiritual world. As the sense of control is destroyed, everyone generally experiences negative emotions such as panic, helplessness, anxiety, fear, worry, and anger. If a loved one dies during the epidemic, the sadness and feeling of loss will be worsened. Faced with this kind of psychological crisis, as the hub of mental health education guidance and management in Nanjing, Nanjing Mental Health Education Guidance Center of elementary and middle schools responded quickly and launched a series of coping strategies.

Launch of Volunteer Service Mode to Provide Psychological Assistance by Hotline

Due to the highly contagious nature of the COVID-19 virus, daily face-to-face mental health education and consultation activities cannot be carried out normally, and the hotline has become the best carrier for psychological assistance. Nanjing has always had a team of psychological volunteers, who carry out psychological hotline services at the Nanjing Elementary and Middle School Students' Psychological Assistance Center (Teacher Tao Workstation). At the same time, the hotlines of the 12 district-level Tao teacher workstations in Nanjing were opened immediately during the epidemic, and the staff on duty came to work under strict protection to provide psychological help for the hotline. In addition, Nanjing "Professor Ning" Studio, a teacher's mental health service platform, has also been launched to provide teachers with psychological anti-epidemic guidance. The opening of these hotlines and consulting platforms has sent psychological support and spiritual comfort to elementary and middle school students, parents, and teachers in Nanjing.

In the early stage of the epidemic, the content of the hotline was mainly about: fear, worry and anxiety of the epidemic; concerns about the safety of themselves and their families; and questions about the disease itself, such as whether the symptoms of a cold and fever are infected with COVID-19 pneumonia, etc. At this time, the function of the hotline is to popularize science, stabilize emotions, and find positive resources to respond.

In the middle stage of the epidemic, when everyone gradually understood the development of the epidemic and the country's response plan, the panic mentality turned to adaptation and began to focus on the topics of family life and interpersonal conflict. Because children have this extra long vacation, the time between parents and children has increased. The benefit of this is that the children have a companionship that is usually difficult to obtain; on the other hand, it also potentially compresses the parents and children time and space to get along. As a result, conflicts between families with poor relationship and conflicts have worsened. At this stage, the hotline is mainly

to guide the caller's emotions and guide them to learn good interpersonal communication methods.

In the late stage of the epidemic, children's long-term exposure to electronic products led to some overuse of the Internet, which stimulated conflicts between parents and children in the use of electronic products and learning anxiety, especially students who are nearing graduation, such as 8th and 12th graders, talked about their anxiety and helplessness about learning in the hotline. The hotline at this time provided more psychological support and problem-solving strategies to help callers perform psychological fitness and restart the chapter of life.

Compile Guidance Manuals on "Psychological Anti-Epidemic" For Elementary and Middle School Students, and Give Guidance to Students and Families on Mental Health Education

Facing the epidemic, the Nanjing Municipal Government and the Nanjing Education Bureau attached great importance to quickly organizing front-line mental health education experts and teachers, combing the psychological hotline at the "Teacher Tao" workstation (including each branch station), and the network psychology of "Professor Ning" Studio psychological distress faced by students, parents, and teachers learned during the consultation. They compiled a set of "Nanjing Primary and Secondary School" Psychological Anti-epidemic "Education Guidebook". Through vivid and easy-to-understand methods such as problem descriptions and case analysis, students, parents and teachers were provided with effective and effective anti-epidemic psychological masks to protect the mental health of children and adolescents during the epidemic.

According to the characteristics and needs of different groups of people, this instruction manual is divided into "student part", "parent part" and "teacher part". Among them, the "student part" focuses on guiding children with different family environments to adjust their emotions, manage time effectively, get along with their families, and understand the impact of the epidemic. Look at the problem from a positive perspective and turn the crisis into an opportunity for self-growth. The "parent part" is to guide parents to review the family's upbringing style, life issues and relationship model through the change of family lifestyle caused by the epidemic. By adjusting the family system and parent-child relationship, psychological harmony in family life is achieved. The "teacher part" introduces the concepts and skills of mental health education to teachers, improves teachers' mental health education literacy, promotes them to better understand the psychological needs of students, and to be an effective teacher. This instruction manual is distributed electronically to elementary and middle schools and families for free.

Design Mental Health Education Courses According to Different Stages of the Epidemic and Carry out Online Course Teaching

In accordance with the general guidelines of "School's Out, But Class's On", relying on the electrification education resources and "Jinling Micro School" network platform, a series of online courses have been established. According to the different stages of the epidemic, it is divided into: psychological popularization and home instruction courses in the early stage of the epidemic; life education courses in the middle stage of the epidemic; psychological adaptation courses in the late stage of the epidemic, preparing for the start of school.

The specific course content includes: how primary and secondary school students cope with the crisis and challenges brought by the epidemic; how to carry out time management and career planning; how to improve resistance to adversity; how to debug the parent-child relationship of families; how to respond to the requirements of online learning, and how to avoid the risk of Internet addiction; how to maintain brain health during an epidemic; how to respond to various emotional and emotional reactions during the epidemic; and how to work regularly and psychological self-protection during the epidemic.

These courses are recorded by teachers of psychology and arranged into the schedule of online learning for students. The network platform and TV broadcast were used to push resources to families in Nanjing, and class schedules were posted by the homeroom teacher to remind parents to assist their children in learning. These courses have helped students and parents and teachers to provide scientific guidance in coping with the psychological effects of the COVID-19 epidemic, and are generally welcomed.

Relying on Social Networking Platforms to Carry out Home Accompany and Guidance

During the outbreak, family education needs guidance. Under the organization and recruitment of the Nanjing Women's Federation, Nanjing's psychological volunteer teachers established trust and cooperation with their mothers in the WeChat group. We used the online log-in card method. Every day, parents wrote a detailed story and feelings in family education after work, and the co-operative family education instructor responded, paid attention to and gave targeted guidance to this story.

The guiding principles are affirmative, supportive, and constructive suggestions to help parents see the impact of education methods in interacting with children on children and adolescents. It pays attention to the subtle development and changes in parent-child relationship, whether the needs and expectations of children and adolescents are better seen and treated, and the emotional development and psychological needs of parents in the process of educating children. This "family support plan" has the main goals

of adjusting family relationships, assisting parents to deal with problem behaviors of children and adolescents, and inspiring parents' self-awareness and growth through the impact on parents' educational concepts and methods. This project cycle has 21 days that helps to form a new family education model.

In summary, what people need in the face of an epidemic are protection, confidence, and caring actions. Nanjing is well-known as the "City of Fraternity and Love". The common concern for the fate of humankind has enabled everyone in it to inspire the potential of life and the spirit of contributing to society. This kind of selfless dedication and service, and the love for children and adolescents, are the greatest motivation to guide us to defeat the epidemic, build up hope, and reshape new life.

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REPORT

Guidance Strategies for Online Teaching during the COVID-19 Epidemic: A Case Study of the Teaching Practice of Xinhui Shangya School in Guangdong, China

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***Abstract**: During the COVID-19 epidemic, schools responded to national calls to implement the "School's Out, But Class's On" policy, i.e. suspending classes without stopping learning. Xinhui Shangya School of Jiangmen City, Guangdong Province uses online teaching to guide students to e-learning. We herein discuss the teacher guidance strategies of online teaching during the COVID-19 outbreak.*

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***Keywords**: COVID-19; Online Teaching; Protocol-Guided Learning; Live Broadcast; Recording and Broadcasting; Micro-Lecture*

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IN order to implement the "School's Out, But Class's On" policy, Xinhui Shangya School of Jiangmen City, Guangdong Province has formulated the "Implementation Plan for 2020 Spring Semester in Middle School Section of Xinhui Shangya School Regarding 'School's Out, But Class's On'".

Xinhui Shangya School is a private school. The school's running conditions are relatively complete. Each student is equipped with a Pad for daily teaching. The school adopts a teacher-led and student-based teaching model based on digital Protocol-guided Learning (Xia, 2020).

Teaching activities are bilateral activities consisting of teacher's teaching and students' learning. Students' learning must rely on teachers' proper guidance, and students' online learning also cannot be separated from teachers' proper guidance. During the COVID-19 epidemic, our teaching was mainly based on live video lessons, supplemented by the individual application of recorded video lectures, and along with micro-lessons to help students learn.

Live Video Classroom with Teacher's Intensive Lecture and Teacher-Student Interaction

The process of the school's live video lesson is "Pre-class learning → Live video classroom (teacher's intensive lecture and teacher-student interaction) → Class quiz → Post-class feedback ". The teaching process of the live classroom is as follows:

(1) **Pre-Class Learning.** Students learn autonomously under the guidance of Digital Protocol-guided Learning. Complete the "Preview Navigation" section within the allotted time. Students with learning difficulties are advised to scan the code to see the micro-lectures, and middle-level students choose on their own, while the gifted students are not encouraged to watch the micro-lectures. If having difficulties in autonomous learning, students can discuss in the interactive area of the Qingning (Lime) platform. Detect the pre-learning situation through Digital Protocol-guided Learning's, and complete "doubts and suggestions" according to the preview (Guo, 2018), and finally upload the snapshot of the assignment to the teacher for correction through Pad.

(2) **Live Video Classroom.** The school uses the combination of the Qingning platform and the Tencent Class Express version of the two-line method to realize online teaching. You can use screen sharing, PowerPoint sharing, video playback, and mobile screen projection to diversify teaching formats according to different subjects, learning contents, and course types. Students can ask questions rose during the lectures directly to teachers through audio, or to leave messages in the discussion area of the platform to achieve real-time interaction between teachers and students.

(3) **Class Quiz.** The subject teacher will test the students according to the content of the lectured lesson, and grasp the students' learning situation in time.

(4) **Post-Class Feedback.** Students upload the snapshot of the classroom test, and the teacher will correct it. Teachers can write comments on students' questions, and can also give students voice messages to personalize the correction. Finally, send the feedback of the test results to the class group and parent group on the same day, and urge students to correct the wrong questions in time and review what they have learned that day.

Recorded Video Broadcast with Detailed Explanation of Difficult Points and Practice Innovation

Compared with the combined lectures and exercises in live video class and teacher-student interaction, recorded video broadcasting classes are more focused on teaching project-based learning methods and assigning student tasks. By giving students time and space to practice, it will improve their learning interest and innovation ability.

In the exploration and practice of recording video and broadcasting, teachers integrate a variety of teaching resources, providing a basis for students' inquiry and practice. Each recorded video lasts about 15-20 minutes. At the end of the course, students conduct autonomous practice inquiry.

(1) **Physics, Chemistry, Biology and Other Disciplines.** For highly exploratory and difficult experiments, such as biological "human use of bacteria and fungi", chemical "burning and fire fighting", physical "force and motion", teachers use recorded videos and simulated experimental teaching to allow students to analyze, solve, and preheat the experimental contents, steps, and details in an autonomous learning way, thereby improving students' familiarity and proficiency in the experiment. After self-learning of the experimental operation of the recorded video and broadcasting, the difficulty of experimental operation is effectively reduced, and the inoperability is broken. This is beneficial for students to cover all aspects of the book from knowledge points to operation details.

(2) **Music and Art Courses.** In the practice of online education, schools mainly adopt the forms of detailed picture explanation, video appreciation, and classroom practice. Taking the music lesson "Playing Hulusi-New Learning Tone 4" as an example, the teacher explains the content of the score, plays a video file to appreciate the music, and feels the musical charm and emotional expression of playing Hulusi during the performance. The teacher plays the repertoire, explaining and demonstrating the playing skills to the students in both the key and difficult parts. Students can adjust the tempo of the recorded lesson according to the speed of their mastery of Hulusi performance.

(3) **Sports and Physical Exercise.** Through video explanations, teachers' action demonstrations and student follow-up exercises are used. Taking the experience class "Physical Recovery Training" as an example, the classroom process includes: warm-up exercise (freehand exercise), dynamic stretching technique action experience learning, rope skipping exercise, and body re-

laxation. Students can master the essentials of various body movements through the adjustment of the progress bar.

(4) **Information Technology Courses.** The opening of the recorded video and broadcasting with rich contents and leading problems. With "Game: No Way! By creating a small game similar to Parkour" as an example, the teacher uses the content of the game to stimulate students' interest in learning, and uses the mind map and knowledge framework to explain the game structure in detail. Through competition, stimulate students' passion for creation. For difficult operation points, students can help them master the essentials by repeatedly watching the recorded lessons. In addition, the design of the curriculum takes into account the stimulation of interest and humanistic education during the epidemic with large classroom capacity.

The recorded video courses are guided by its concentrated knowledge and difficult points, sufficient independent practice space, and interesting questions to guide students in each way during and after the class. This is a fruitful practice of technical courses.

Micro-Lecture Aids Learning with Classroom Switch New Knowledge Guidance

Schools take advantage of Digital Protocol-guided Learning to provide guidance for students' autonomous learning. The Digital Protocol-guided Learning for each lesson is divided into six sections: "learning goals", "pre-learning navigation", "class interaction", "summary", "post-class improvement", and "postscript". Each lesson is supplemented by learning-oriented, scenario-creating, and difficult-to-interpret micro-videos to provide effective support for students' autonomous learning.

Through micro-lecture assisted teaching, teachers can either guide students to scan the QR code in Protocol-Guided Learning to watch micro-lectures during the preview process, or they can send micro-lecture through the platform. Through micro-lecture, students can not only understand the basic information such as the author's profile, historical background, etc., but also learn in a targeted manner based on the knowledge points and focuses of this lesson. Students can not only watch science simulation experiments, grasp the experimental principles, but also can be used for review after class to consolidate the students' learning foundation. Teachers send different micro-lectures according to the learning ability and learning needs of students at different learning levels. This satisfies students' individual learning needs and fully mobilizes their enthusiasm for learning, and helps students to construct knowledge in depth (Li, 2019).

Through the proper guidance of teachers, the "School's Out, But Class's On" was successfully carried out during the COVID-19 epidemic, which provided a solid guarantee for students to carry out e-learning.

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REPORT

Practical Exploration of Using "Cloud Classroom" to Organize Online Learning: A Case Study of Jianye District, Nanjing during the COVID-19 Pneumonia

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***Abstract**: In the case of COVID-19 pneumonia, how to carry out "School's Out, But Class's On", i.e. suspending classes without stopping learning, is not only a problem to be solved by schools, but also a problem that education administrative departments need to solve. During the epidemic, the Education Bureau of Jianye District in Nanjing actively responded to the government's call to implement the "School's Out, But Class's On" policy. I will introduce the specific measures to implement "School's Out, But Class's On" in the Jianye District of Nanjing, Jiangsu Province of China.*

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SINCE February 4th, 2020, the Leading Group of the Ministry of Education for the COVID-19 Epidemic has issued three guiding documents including "Guiding Opinions on the Implementation of Online Teaching Organization and Management in Colleges and Universities During the Epidemic", "Notice to Support Education and Teaching with Informatization during the Epidemic" and "Notice on Several Issues in Targeted Teacher Work during the Epidemic Prevention and Control". It is proposed that schools use the online platform to guide students to realize "School's Out, But Class's On", aka "suspending classes without stopping learning", during the COVID-19 epidemic (Zhou, et al., 2020).

On February 12th, the Ministry of Education and the Ministry of Industry and Information Technology jointly issued the "Notice on the Work Arrangement of 'School's Out, But Class's On' During the Postponed Spring Semester". It is required to adhere to the principle of unified provincial-level deployment and implementation of measures tailored to local conditions in various schools, make overall arrangements, open an education cloud platform, and use the Internet to achieve "School's Out, But Class's On" to provide support and guarantee for students' home study (Ministry of Education of the People's Republic of China, 2020).

After the release of the document by the Ministry of Education, the Education Bureau of Jianye District in Nanjing paid special attention, organized and responded actively, and held video conferences. We studied and issued a document as "Notice of Jianye District on the Implementation of the Work of "School's Out, But Class's On" in Response to the Epidemic". It guided the entire district to use "Internet +" technology to carry out online teaching in an orderly manner. We adhered to the "province, city, district, and school" four-level synergic cooperation to provide guidance, service, and guarantee for students' home study.

Make Good Use of Provincial and Municipal Air Classroom Platforms and Resources

In response to the severe epidemic and the postponed Spring semester, platforms such as "Jiangsu Famous Teachers Air Classroom" and Nanjing "Jinling Micro School" provide comprehensive courses and online Q & A services for elementary and middle school students. The Teacher Development Center of Jianye District issued a notice to widely publicize the elementary and middle school students in the district, and actively use the platforms and resources. At the same time, we organized outstanding teachers in the district to answer questions for students online; and cooperated with provincial and municipal teaching and research departments to develop high-quality learning resources.

Organize "Jianye Cloud Classroom" Online Learning

Build "Jianye Cloud Classroom" Online Learning Platform

In order to provide high-quality online self-learning platforms for elementary and middle school students in the district, the Jianye District Education Technology Office has established a "Jianye Cloud Classroom" network platform (http://ykt.jyedu.cn) to organize online learning for elementary and middle school students. The Teacher Development Center organized subject seminars for subject teachers. According to the learning situation and characteristics of students, implement the overall planning and curriculum design of online teaching. At the same time, teaching and research staff lead key teachers in the region to develop high-quality curriculum resources based on the subject knowledge system and learning topics and upload them to the cloud classroom platform. Students can arrange learning independently as needed. At present, the total number of lessons on the Jianye Cloud Classroom Platform is 1,076, including 607 for elementary students and 469 for middle school students.

Opened the "Jianye Cloud Classroom" Cable TV Live Channel

In order to protect students' eyesight and reduce the time spent watching computers, starting from March 2nd, 2020, Jianye Cloud Classroom had begun to broadcast on the cable TV with the famous teacher's classroom channel jointly created by Jiangsu Education Department and Jiangsu Cable TV. Jiangsu Cable TV has opened up a dedicated live channel for grades 1-9 for Jianye Cloud Classroom. Students watching Jianye Cloud Classes on TV can not only effectively acquire knowledge, but also relieve eye fatigue properly. This measure is welcomed by students and parents.

Instruct the School to Set Up a "Live Class"

In addition to organizing students to participate in relevant classroom learning activities of provincial, municipal, and district famous teachers' air classrooms, the district's primary and secondary schools also combine their own characteristics and individual needs of school students, relying on live broadcast platform and open live interactive classrooms such as Tencent classrooms, Dingding campus, Seewo, CCTALK, QQ, etc. Subject teachers arrange learning tasks, online tutoring, and answer questions after class in accordance with the learning situation of the students, so that let students learn at home in diversified forms and richer contents.

Improve Technical Support and Guarantee

In order to ensure the stable operation of the cloud classroom platform, the educational technology department of Jianye District monitors on duty 24 hours a day. Through the collaboration with the Education Metropolitan Area Network and the Nanjing TV Education Museum, through the joint mobilization of the urban area, the distribution of Telecom and China Mobile access users is realized.

At the same time, stored data such as videos and pictures that require high bandwidth and high disk read and write to the cloud, and utilized the capabilities of the CDN cloud to achieve high concurrent access, greatly reducing the pressure on the local

data center. Since its launch, the platform has been running smoothly, with zero failures and no stutters, and has provided students with a good experience.

Jianye Cloud Classroom is completely open and shared, no registration is required, and it supports login as a "guest" to watch all the micro courses. In addition to meeting the online learning needs of students in the region, the platform and resources of the region and schools are encouraged and encouraged to open to the outside world. Judging from the operation situation, after the Jianye Cloud Class is online, in addition to serving students in the urban area, it is also free of charge to other provinces and cities across the country. Schools in Guangdong, Hubei, and Changzhou and Shuyang in Jiangsu have also used this platform.

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REPORT

Practical Exploration of Home Study Guidance for Students during the COVID-19 Pandemic: A Case Study of Hangzhou Liuxia Elementary School in Zhejiang Province, China

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***Abstract**: During the COVID-19 pandemic, Hangzhou Liuxia Elementary School in Zhejiang Province adopted an online education model to carry out home-based distance education and student academic counseling, and actively developed teaching practices for home-based learning. We discuss the teaching practice of students' home study during the pandemic.*

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AFFECTED by COVID-19 pandemic, the school is unable to carry out normal teaching activities. The China government adopts the method of "School's Out, But Class's On", i.e. "suspending classes without stopping learning", to continue its teaching activities. Teaching moved from offline to online, teachers moved from classroom face-to-face teaching to online cloud teaching, and student learning moved from classroom listening to home study. "School's Out, But Class's On" has completely changed the way students learn and teachers 'teaching methods, and has completely overturned the traditional teacher-centered teaching model. This is a test of student-centered education in China's education reform to guide students to learn at home (Zhou, et al., 2020).

In order to strictly implement the requirements of the Ministry of Education of China, Zhejiang province and Hangzhou city for the "School's Out, But Class's On" during the COVID-19 pandemic prevention and control period, Hangzhou Liuxia Elementary School in Zhejiang Province made full use of the online education platform and adopted an online education model to guide students to study at home. We actively carried out online education and teaching activities to rationally arrange students' home study time. Strived to improve the quality of students' home study and cultivated their ability to study at home. To the maximum extent, it guaranteed the normal progress of students' learning progress and laid a solid foundation for the subsequent restoration of normal teaching activities.

Problems Encountered by Students at Home during COVID-19 Pandemic

The school used "Internet+" educational technology to guide students to study at home. However, in the specific implementation process, students often could not effectively study at home due to various problems. The main issues are as follows:

Fundamental Changes in the Learning Environment

During the pandemic, students switched from traditional classroom learning to online learning at home. In the absence of teachers' face-to-face instruction and parental supervision, students who lack self-control have become a formalism of online learning, and their home study results are not satisfactory.

It was difficult for teachers to adapt to the new environment of online teaching. Teachers did not know how to express themselves in the face of live broadcasting. Their teaching language lacked flexibility, and the form was simple and formless, which could not attract students' interest. In addition, online teaching could not directly face students, and could not achieve real-time teacher-student interaction, so student participation was not high. As a result, the teacher's live broadcasting completely became a self-talking performance.

Unsuitable Learning Resources

National and local education administration departments at all levels provide schools with a large number of high-quality teaching resources. Giant education companies are also actively enriching curriculum education resources to provide resource guarantee for online learning during pandemic. But the numerous educational resources ignore the true learning needs of students. The incompatibility of learning ability, resources and students' learning situation leads to students being hindered in home study and poor study effect.

Unskilled Application of Online Teaching Tools

Online teaching not only puts forward requirements for teachers, students, teaching content and resources, but also sets higher standards for the online teaching support environment. On the one hand, teaching platforms had encountered technical errors in the face of huge data demands. Many online education platforms had problems such as freezes, flashbacks, and dropped calls. These directly led to a great impact on the teaching and learning effects. Second, in terms of platform applications, many teachers and students were not proficient in the application of teaching platforms, especially those of middle-aged and elderly teachers, and they were not able to use modern educational technologies to realize live broadcasting.

Too Simple of the Teaching Activities

During the pandemic, online e-learning has become a major activity for student home isolation. E-learning courses focused only on students' academic studies and ignore other extracurricular activities. Such a course arrangement was not "student-centered." This lacked the idea of whole-person education, ignored the developmental nature of students as individuals, and inhibited the active nature of school life. The individual life potential of students could not be developed freely, fully, comprehensively, harmoniously and sustainably. This was not conducive to the all-round development of students.

Measures Taken by Students at Home during COVID-19 Pandemic

In response to the problems that students encountered during the pandemic, and in combination with the actual situation of the school, we have taken the following measures by referring to the accumulated experience in the past:

Combining School Reality to Construct an Educational Information Environment

The school has basically built a "three links and two platforms", which provided basic technical and platform support for students' home study. At the same time, the school also used a variety of online platforms to further improve the information environment during the pandemic. We continued to strengthen the integration of education

informatization and classroom teaching, and further improved education and teaching through means of education informatization.

Considering the lack of information technology capabilities of Elementary School students, in the early days of online teaching, the school uniformly chose QQ groups, which were stable and easy to operate, and were familiar to both students and parents as a platform for online learning. This ensured that the whole school's teachers and students could quickly enter the atmosphere of online learning.

After the online teaching was initially mature, the school guided students to use national and local education digital resources and other teaching platforms to obtain more teaching resources. In terms of platform selection, the school unified teaching platform to avoid confusion caused by frequent platform changes.

Restructuring Teacher-Led and Student-Centered Teaching Methods

In order to mobilize students' initiative and enthusiasm for learning, and help students learn at home, we carried out online teaching through feedback interactive mode. The specific process is shown below:

- Teachers sent class resource packs to students through teaching platforms. This includes protocol-guided learning, micro-lecture resources, and practice testing questions. Students downloaded their own resource packs on the teaching platform for home study and practice. The teaching platform analyzed student data and fed it back to teachers.
- Teachers used the shared screen function in Tencent meeting tools to organize students to carry out online teaching. In the teaching process, teachers taught based on the feedback results; at the same time, students were invited to express their views and opinions to help students improve their attention.

Combining School-Based Resources to Build Appropriate Learning Resources

Students' home study needs to build diverse resources suitable for their learning. During the pandemic, we organized teachers to conduct regular online discussions to prepare protocol-guided learning materials that meet the needs of students.

In order to ensure the comprehensive development of students' morality, intelligence, physical exercise, arts, and labor, the school has developed a special course on "learning martial arts to prevent virus, and living a healthy life" based on the original school-based curriculum and the current status of the pandemic. Through this special course, students were guided to exercise at home and strengthened their management of physical health while learning. This enhanced students' practical activities and enriched their spiritual life.

Use Home-School Communication to Achieve Home-School Co-Education

During the pandemic, parents were more responsible for supervising student learning. In order to grasp the learning situation, the school communicated with parents in time and cooperated with each other. This gave play to the advantages of home-school synergy and formed a good atmosphere for home-school co-education.

- **Parents accompany their children to study.** Parents urged their children to complete the learning tasks assigned by the teacher. Participate with your child at the same table, and learn together to directly sense their learning status and promptly remind them when they are distracted.
- **Parents guide children's healthy learning.** Parents guided children to go green online. Paid close attention to the use of computers, mobile phones and other equipment. Parents instructed them to do eye exercises regularly to protect their eyesight. This not only improved the efficiency of learning, but also realized the integration of work and rest.

Elementary School students' home study outside the normal teaching scene is a new topic (Xie & Yang, 2020). During the pandemic, we carried out corresponding practices and attempts, but were limited by various factors. In particular, the difficulty in transforming the teaching methods of teachers and the unfamiliar grasp of information technology need to be continuously improved in the future.

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REPORT

How to Carry Out Epidemic Prevention and Control After School Starts with the COVID-19 Epidemic Mitigated? A Case Study of Experimental High School in Wangmo County, Guizhou Province, China

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***Abstract**: In order to cope with the impact of the COVID-19 epidemic on student learning, the Chinese government has launched a "School's Out, But Class's On" strategy. With the further control of the epidemic, schools in some provinces have begun to resume classes, but the epidemic prevention and control work should not be lax after the class is resumed. Guizhou is one of the provinces where the middle schools and senior high schools resumed classes earlier. The epidemic prevention and control is still very critical even the school was resumed. I herein used the Experimental High School in Wangmo County, Guizhou Province as an example to introduce the epidemic prevention and control strategies after the school resumes classes.*

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***Conflict of Interests:** None.*

WANGMO County is located in the southwest of Guizhou Province, with remote terrain. Affected by natural conditions and history, economic development is relatively backward. Wangmo Experimental High School is a full-time boarding high school with a total of 2,688 students. In response to the COVID-19 epidemic, Wangmo County Experimental High School adopted a gridded management strategy for prevention and control.

According to the arrangement of the Guizhou Provincial Department of Education, the senior high school students (12th graders) and senior middle school students (8th graders) began to return to class on March 16th, 2020 and gradually entered the normal teaching process.

Aiming at the problems of school opening and students returning to school safely, Wangmo Experimental High School formulated the "General Plan for Resuming Experimental High School in Wangmo County during the COVID-19 epidemic" and a series of subprograms. The issue of epidemic prevention and control during the resumption was regulated. During the student's return to school, Wangmo Experimental High School set up baggage disinfection checkpoints, temperature measurement (health code scanning) checkpoints, and the homeroom teacher report office (signing a letter of commitment) at the school entrance. Students wear disposable medical masks throughout the school, actively cooperate with body temperature detection and enter dormitories or classrooms along the prescribed route, thereby ensuring that students return to school safely and start school smoothly.

After returning to school, in order to ensure the normal study life of students on campus, the school adopts the following preventive and control measures:

Dividing Areas and Grid Management

The school implements the division of regional responsibilities, dividing the campus area into apartments, teaching buildings, cafeteria and other areas. Any problem that occurs in the corresponding area is the responsibility of the person in charge of the corresponding area. At the same time, the school set up the following working groups: teaching support group, life support group, prevention and control material group, campus health group, student health group, and teacher and student security group.

(1) The teaching support group is mainly responsible for the order of daily teaching activities in the school, collecting student learning, teaching tests, and attendance of teachers and students. Timely follow-up and report on faculty, staff and students absent due to illness.

(2) The life support group is responsible for the normal meals of teachers and students throughout the school. Schools implement off-peak dining. Teachers and students pass the fixed temperature detection door, and those with qualified temperature enter the cafeteria to eat. Teachers and students bring their own tableware. When dining, each person has a table, facing one direction, 1.5 meters apart from the front, back, left and right.

(3) The prevention and control material group is responsible for the storage and distribution of prevention and control materials. The school distributes materials such as face masks, hand sanitizer, disinfectant and gloves to teachers and students for free every day.
(4) The campus health group sterilizes classrooms, dormitories, libraries, restaurants, sports areas and other places daily. Have soft-soap, soap, and quick-drying hand sanitizer in the hand washing area.
(5) The student health group conducts temperature tests on all teachers and students every morning, noon and evening, and implements a "daily report" and "zero report" system. They recycle old face masks. At the same time, they broadcast the knowledge and precautions related to epidemic prevention and control continuously during the recess.
(6) Teachers' and students' security group is responsible for the safety office. The campus implements enclosed management, and teachers and students are prohibited from going out unless there are special circumstances. Once out, students need to isolate themselves for 14 days before returning to school.

Implementing Responsibilities and Comprehensive Control

In order to strengthen the responsibility management, the school clearly recognizes the work responsibilities of personnel at all levels:

(1) The principal fulfills the main responsibility of school epidemic prevention and control. Take it as a top priority, do scientific management, implement it effectively, and strengthen supervision.
(2) The homeroom teacher manages the students in the class and does a good job of preventing and controlling the epidemic. Supervise the completion of daily learning tasks and epidemic prevention and control, and do psychological counseling.
(3) Other teachers assist the homeroom teacher in managing the students in the class. Help to do the epidemic prevention and control and teaching.
(4) Parents of students cooperate with the school to improve the school's epidemic prevention and control investigation. Need to take the initiative to communicate with the homeroom teacher and subject teachers to form a home-school synergy.
(5) Students obey the arrangements of the homeroom teacher and subject teachers to actively cooperate with the epidemic prevention and control work.
(6) School janitors strengthen their awareness of the position, prevent the spread of the epidemic to schools, protect the health of teachers and students, and maintain campus stability.
(7) Residential management staff implements closed management of student dormitories. Check the information of the students who are staying, and verify the real name and temperature of the personnel entering the dormitory.

(8) Cafeteria workers strengthen awareness of epidemic prevention and control. Wear disposable hats, masks, and gloves as required avoiding direct contact with fresh meat and poultry.
(9) School medical doctors are responsible for school health care and epidemic prevention and control. To ensure the health management of teachers and students; organize, direct, supervise and inspect the implementation of disinfection in schools.

Routine Teaching Activities Centered on Teaching

The quality of teaching is the foundation of the school's survival and development. While doing a good job in epidemic prevention and control, education and teaching must be carried out in an orderly and normal manner. Teachers should formulate teaching quality standards. After formal resumption, the school will test and analyze the data of students and carry out hierarchical teaching activities. At the same time, due to the implementation of online lessons during "School's Out, But Class's On", some students failed to participate or the results were not satisfactory. Therefore, this group of students needs to be brought together, and teachers provide additional guidance, so as to ensure the quality of teachers' teaching and solve the learning problems of them.

Strict Supervision and Strengthen Discipline

In order to strengthen supervision and management, the school clarified the work regulations:

(1) Supervise the performance of faculty and staff in their posts and implement their duties.
(2) Supervise the situation of epidemic prevention and control, strictly prevent and control input, and strictly prevent and control the spread.
(3) Supervise the education and teaching situation.
(4) Supervise the moral situation of teachers.

After the school resumed classes, a series of prevention and control measures adopted by Wangmo Experimental High School showed the following highlights:

Multi-Faceted Epidemic Prevention and Control

It can be seen from the school epidemic prevention and control that Wangmo County Experimental High School epidemic prevention and control involves many details. From the whole school's general plan to various detailed sub-plans, from a small point to an entire area. As a result, the situation of prevention and control of epidemic situation with full coverage and no dead ends has been formed.

Standardization and Systematization of Epidemic Prevention and Control

The division of labor in the prevention and control of the experimental high school in Wangmo County is clear, with its own duties. Schools take epidemic prevention and control, education and teaching as top priorities, fully improve reporting and distribution, and coordinate overall work.

Multi-Sectorial Cooperation to Form an Epidemic Prevention and Control Model of "Public Security + Health + Education"

To ensure the safety of teachers and students, the school contacted the public security, health and education departments, and the three jointly stationed the school to prevent and control the epidemic. Thus, a rigorous epidemic protection wall was built for the teachers and students of the school, and the teachers and students were escorted safely.

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