



E-learning and Pandemic: Management and Adoption of Different Online Platforms in China

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Abstract

The COVID-19 pandemic has had a significant influence on education globally, and China has been no exception. In response to the school closures, many educational institutions in China have turned to E-learning as a way to continue delivering education to students. The Chinese government has also played a role in promoting E-learning during the epidemic by launching initiatives to support the development and managing online education. The rapid growth of E-learning in China has been facilitated by the emergence of online learning platforms that offer a wide range of courses to students. The qualitative approach has been adopted for this research and 25 valid responses were collected from the participants. The findings of this research reveal the importance of E-learning and the studies management ability of China during pandemic. In fact, E-learning has revealed as an innovative approach to amplify the procedure of learning and it may be further enhanced by social media. The findings of this research will motivate other countries in applying and managing E-learning in pandemic or non-pandemic situations in a better way. Despite the benefits of E-learning, there are also limitations to this form of education, including technology and infrastructure limitations, quality of education, student engagement, teacher training, and assessment and evaluation. Overall, E-learning has become a crucial tool for delivering education during the COVID-19 pandemic in China, but there are still challenges to be addressed to ensure that students receive a high-quality education through digital means.

1. Introduction

At the end of 2019, the outburst of COVID-19 in Wuhan, had greatest chance to spread the infection and became the health emergency at public level [1]. The government had to take measures to stop public gatherings to minimize the infection, for this they had discontinued business dealings, public activities and all economic operations [1]. To avoid the face-to-face interactions and preventing the virus from spreading, Ministry of Education (MOE) of China suspended all the educational institutes [2]. The educational departments adopted the alternative methods for teaching during this outbreak and lockdown situation [3] and it facilitated the way for E-learning. Despite delaying the classes, MOE of China adopted different solutions like E-learning program, according to their domestic situations. Therefore, in China about 170 million students, from primary and secondary school, participated in this extensive E-learning program which started from mid-February 2020 [2].

E-learning is very easy to comprehend and use. This teaching approach makes extensive use of computers, laptops, smartphones, and the internet. In many industries, especially education during this pandemic, E-learning has shown to have the fastest development [3]. All schools and universities in China implemented E-learning applications during the COVID-19 pandemic to conduct online teaching and learning, but at that time, not every person was aware of the effectiveness of these technologies in the educational system [4]. During that era, E-learning was not a popular way to get an education in China. During the COVID-19 pandemic, China set up different E-learning platforms to help students and the overall Chinese population get the education they needed [4].

Studies investigate how satisfied students were with their online education during the COVID-19 pandemic and how important factors like learning stress and motivation for learning mediated that satisfaction. The current study examines the relationship between academic success during COVID-19 and student's contentment with E-learning. In order to understand the relationship between students' satisfaction with E-learning and their academic achievement, the study also examines the adaptability of online learning platforms.

2. Literature review

Information technology (IT) offers a lot of training and educational resources that can help students and teachers learn and teach better. It is also employed to improve educational policies and to encourage a creative atmosphere at educational institutions [5-7]. E-learning is computerized, interactive learning at the learners' and lecturers' convenience. Modern technologies and Online tools are integrated into E-learning education [8]. In addition to "electronic," "E" should express "everything, everyone, engaging and easy" [9]. It promotes content delivery, collaboration, and confidence in both instructors and learners. E-learning can generally be divided into synchronous and asynchronous types. With synchronous E-learning, teachers and students converse in real time. It can be carried out via live chat, webinars, or video conferencing. Asynchronous E-learning does not call for students and teachers to communicate in real time. The instructional resources are available to learners at their own convenience and speed. Online classes, self-paced modules, and discussion boards are a few examples.

Satisfaction for E-learning

China convinced millions of regular learners to restart their studies online in response to the COVID-19 pandemic. Students at Chinese educational institutions voluntarily embraced this change as the new norm after China first implemented E-learning tactics by promoting and carrying out online learning courses there [10]. Academic achievement is positively connected with the desire for and interest in E-learning, which may explain why more successful students are satisfied with E-learning. [11]. COVID-19 suspended institutions globally, compelling about 10 million students to study off-campus. The shift from lecture halls to online classes transformed higher education. E-learning solved the higher education dilemma immediately. It was new to many colleges and students, making it a challenge. E-learning's impact on student satisfaction and academic accomplishment increased during the pandemic. During the outbreak, E-learning students reported higher learning satisfaction and academic accomplishment [12]. Student satisfaction is associated with their experience during E-learning. The student will be satisfied with his or her positive experience and dissatisfied with a negative experience of online learning, and the nature of his or her experience will decide whether to continue E-learning or not [13]. Because of the many advantages that come with E-learning, its

acceptance rate is increasing worldwide. It includes everything from increasing user awareness, satisfaction and engagement to offer thorough, high-quality knowledge at an affordable cost. Online learning is steadily replacing traditional learning techniques because of the advantages it provides.

During the epidemic, Indonesian students were dissatisfied with E-learning due to poor Internet connection, imprecise teaching materials, and lack of lecturer support. E-learning allowed students to use technology for learning, but many grumbled about the absence of critical feedback [12]. Afghan students' academic performance and online teaching satisfaction after COVID-19 has also investigated. Afghan students were quite disappointed with this kind of instruction. The university's weak online learning policy, teachers' lack of technological support, an insufficient student evaluation system, and students' lack of online education all affected their satisfaction. It is also discovered that COVID-19 significantly influenced students' performance in various areas, including course tasks, results, and assessment [14]. In Nigeria, the awareness and level of participation of students in E-learning were investigated. This study revealed that students also faced some challenges during online learning, which affected their level of satisfaction [15].

During COVID-19, the Higher Education Commission (HEC) of Pakistan motivated the educational institutes to continue the academic activities through online learning. Feedback from the students engaged in online learning revealed that different pathways were utilized for online classes. During a survey, more than 60% of students gave a positive response to the completion of a course and satisfaction with E-learning [16]. During Covid-19 epidemic, the first country that switched from conventional to online education was China. Students in Chinese colleges and universities voluntarily embraced this change as the new norm after China first implemented E-learning tactics by promoting and carrying out online learning courses in those institutions. [10]. Three factors—interaction with teachers and fellow students, self-efficacy, and student engagement—influenced the enjoyment of students during E-learning [17].

The aim of the present study is to investigate the level of satisfaction of teachers, pupils, and parents regarding E-learning by identifying the factors that motivated them and the various online platforms used for E-learning. By conducting interviews, this study hopes to answer the following research questions:

1. Were the E-learning initiatives implemented by educational institutions successful?
2. During the epidemic, which online education tools were the most widely used?

3. Methodology

Research design

This study used the Interpretative Phenomenological Analysis (IPA). The method has its origins in phenomenology, which is concerned with the investigation of individual, subjective experience. Semi-structured interviews, for instance, were conducted to study a particular group of respondents in a deeper way [18]. IPA is more appropriate for studying people's reactions to specific events [19]. Transcription of interviews or data, examining the data to find patterns and themes, and creating interpretive summaries are all part of IPA analysis. IPA encourages researchers to stay close to the data and let it lead their study of participants' experiences.

Participants

The participants in our research were students, teachers, and parents who were involved in E-learning from different regions during pandemic. This research was done in the schools and universities in one city of China. The responses of 25 participants were taken as valid to carry out the research. Participants in this research were Chinese as well as foreigners. Because of the pandemic situation, we could not conduct face-to-face interviews. Students from middle schools and teachers from primary and middle schools were interviewed. The parents whose children participated in this research were studying in both primary and middle schools. All the participants in this research participated voluntarily. The purpose of the study was clarified to participants, and they gave their written consent. The study was voluntary, and participants could skip questions they

didn't want to answer. Respondents were informed during the consent process that the data would be used only for academic purposes.

Data collection instrument

An individually semi-structured interview based on IPA was conducted. The questionnaire was validated and administered by a panel of expert professors. Multiple platforms were used for interviews, like calls, WeChat, or QQ (mostly used APPs in China). After collecting the demographic details of participants, the participants were asked these questions. "What do you feel about the E-learning during pandemic?", "What factors motivated you to use E-learning and why did you find it satisfying?", "Which online platforms were most frequently used during the pandemic?". Interview questions were basic and straightforward to prevent any uncertainty, ranged from 25 to 35 minutes for each. Interview questions were designed both in English and Chinese. We gathered the responses in English (from foreigner participants) and in Chinese (from Chinese participants). Then Chinese responses were translated into English for the analysis. The sample was chosen for the current study using a purposive sampling technique. According to the previous researches [20, 21], the purposive sampling strategy is often employed in qualitative research to find and select the information-rich instances for the most effective usage of the resources available.

Data analysis

This interview data was analyzed in different steps [19, 22]. The verbatim transcripts were examined for key themes and expressions that revealed each participant's E-learning perspective. The second process was marking up transcripts with themes from the notes. After recording the themes independently from the transcript, they were evaluated for resemblance and differences. Similar concepts were grouped and labeled. Researchers independently coded and validated the procedure.

4. Results and Discussion

This part summarizes the findings of the analysis of 25 valid interviews conducted using IPA. The research has been divided into two "management" portions, including

"motivations and satisfaction of E-learning management" and "different platforms used for E-learning"

a. Motivations and satisfaction of E-learning management

The management of courses, accessibility, cost, convenience for users, quality education, and opportunity were found by the researchers to be the main characteristics that contributed to participant satisfaction with E-learning during pandemic (Figure 1).

1. Accessibility

The majority of participants were motivated and satisfied to embrace E-learning or take part in courses via online learning because of the simplicity of accessing online courses. Students may have an easy access to the concerned courses.

The ability to access the content is major benefit of E-learning. The content is right at your fingertips, so you don't need to search for it (Participant 4).

E-learning is accessible to everyone at any time and from any location, and its ease encourages studying around-the-clock (Participant 7).

Learning through E-learning gives the learner the freedom to study when it's most convenient for them (Participant 11).

Students desire to learn more, but they are reluctant to compromise on giving up ease to do so. E-learning is a highly flexible and convenient way to train one-self regularly or whenever one has free time. It lets people learn just when they need to. It is consistent with the previous researches [23, 24]. The studies revealed that E-learning is flexible when things like place and time are taken into account. The learners have the freedom to choose the time and place that works best for them.

2. Affordability

E-learning classes are popular among students because they are inexpensive and affordable. Many online education sites offer free, high-quality education, which is a big attraction for students.

E-learning is a time- and place-independent, cost-effective learning solution (Participant 8).

There were a variety of digital tools that facilitated interactive contact between a teacher and a student even when they are not physically present in the same room (Participant 23).

The availability of different platforms made participation in assessment and the timely submission of assignments digitally possible (Participant 18).

Due to its cost-effectiveness and low financial load, E-learning has been widely adopted by students, particularly during the pandemic age. It is economical in sense that it doesn't the need for students to travel. It also provided the facilities for the submission of assigned tasks.

3. *Enlivens the topic*

The participants of this research emphasized the fact that they participated in E-learning due to the captive character of the format. Due to the inclusion of multimedia, the subject matter of the E-learning experience held participants' attention. and, in some instances, because of the interactive character of the content. According to the findings of previous studies, the primary motivation for implementing new technology in educational settings of a higher level is to facilitate increased student interaction [25, 26].

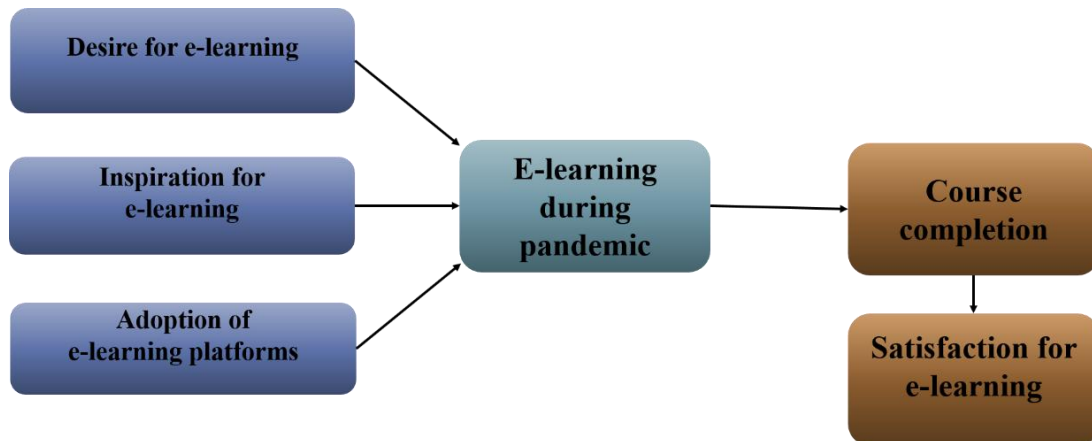


Figure 1. Motivations and satisfaction of E-learning management.

E-learning helped me keep my subject-matter expertise current with the most recent modifications, and I very much appreciated that time period (Participant 25).

Online education resembles an interactive text book in many ways. To continuously assess the knowledge acquired, some also include tasks and quizzes (Participant 2).

I think that when youngsters watch or hear anything in moving visuals or movies, they may readily retain it and relate to it. Therefore, in addition to keeping students' attention, images also aid in helping them remember the material for longer periods of time (Participant 4).

All the participants were strongly inspired to adopt E-learning because of the engagement that it offers, and because of this, it engages the audience (especially primary school students) for a longer time period. The use of information and communication technology (ICT) tools has the potential to affect and revolutionize learning by fundamentally altering the manner in which content can be taught and learnt [27].

4. Effective academic achievement

The learners exhibited a strong desire to learn more and enjoy content of a higher quality. This was the impetus that led to the widespread adoption of online learning. E-learning, which they believe to be effective and which may make a major contribution toward the acquisition of a particular skill, was essential because of this. Online learning enabled the continuation of education for students during the challenging time.

E-learning facilitates the use of a wider variety of resources, in addition to traditional textbooks, for the transmission of information and content (Participant 14).

During the lockdown period, educational programs were conducted on a global level to acquire important skills while sitting in a room, or by having seminars, which were organized for students of the same or different institutions under one roof. E-learning proved to be the most effective method of education during this time, and it continues to be the most effective method of education today (Participant 19).

Educational institutions performed well during the COVID-19 pandemic lockdown by utilizing technology to avoid the loss and interruption of education delivery for course completion (Participant 21).

Students who are engaged in their coursework report higher levels of overall enjoyment, enhanced motivation to learn, reduced feelings of solitude, and improved academic achievement in the context of an online learning environment. Students are able to learn at their own speed and without being constrained by a set schedule when they participate in asynchronous online learning. As a result, it brings about an increase in contentment and a reduction in tension [24, 28].

5. *Opportunities*

The participants' levels of satisfaction with E-learning were impacted by a number of different aspects, including the availability of instructor, as well as the educational approach that was utilized. The satisfaction with E-learning is also influenced by the institutional support that is provided to participants, the technological support that is offered, the structure of the course, the pedagogic techniques employed by the lecturers, the support that is supplied to participants, and the strategies that were used to measure the achievements of participants.

E-learning has consistently been very beneficial to me. By taking the online classes, I was able to land both positions, and whenever I was unclear about an issue, I would look for lecture videos to help me understand (Participant 12).

Gives individuals access to the most recent technology, allowing them to compete with the rest of the world by developing their skills (Participant 17).

All the participants discussed about how E-learning may act as a support system for them as they carve out their careers. It assists in the development of their talents and the expansion of their knowledge, both of which ultimately lead to the creation of work chances.

b. Platforms used for E-learning

E-learning is a technological advancement that has had a significant impact not only on the method of education but also on the practice of teaching. E-learning has taken place on a number of different online platforms in China while the COVID-19 epidemic has been ongoing; however, some platforms have seen significantly higher usage than others. Participants of this this research verbalized about the platforms used during E-learning (Figure 2). After conducting an analysis of the interviews, it was discovered that the following platforms were among the most often used for online education.

During the pandemic, students were engaged in online learning. In order to improve the effectiveness of online teaching, sometimes different task-based teaching methods were used. I mostly used Ding Talk (钉钉) and sometimes used Tencent Meeting (腾讯会议) and SuperStar Learning Pass (超星学习通), (Participant 14).

To teach the primary school students online, I usually used Ding Talk (钉钉), Tencent Meeting (腾讯会议), and Enterprise WeChat (企业微信). We used these Apps because they were old and had mature systems for online teaching (Participant 22).

At first, I used the ZOOM online platform, but later it started charging money. Then switched to Ding Talk (钉钉) and Tencent Meeting. I sometimes recorded online lectures while using Ding Talk (钉钉) which were very helpful for the students (Participant 11).



Figure 2. E-learning platforms used during epidemic.

Many online platforms have been used for E-learning in China during COVID-19 epidemic, although some have seen higher usage than others. This section discusses some of the most popular E-learning platforms in China.

1. Commonly used platforms in schools and universities

Tencent Meeting/Classroom

With the help of Tencent Meeting, anyone could hold and joined meetings from any location. Its services were easily accessible in mainland China. Tencent also owns VooV, which is its foreign counterpart. Tencent, one of China's biggest internet corporations, created Tencent Classroom, a complete E-learning platform. Tencent Classroom was a

great tool for online learning and teaching since it had a variety of functions like live streaming, video recording, and online tests.

DingTalk

Alibaba Group created the business communication and collaboration platform called DingTalk. The majority of educational institutions chosen the DingTalk platform because it ensured the quality of instruction and because COVID-19's influence meant that institutions must manage students uniformly online. Students used the DingTalk platform in their classes as a result. Students were motivated to utilize the DingTalk platform more actively because they found it to be simple to use and had favorable opinions of the platform's performance, features, and design. Students were able to respond via the message window.

WeChat

WeChat performed routine interactions, clocking, permission, and other tasks in addition to live meetings. Therefore, it required some sort of privacy interference conduct in order to function as a teaching tool. The majority of users also believed that WeChat is a secure platform, despite the fact that supervisors could see the conversation histories of employees or students, and the meeting moderator had complete control over who had access to the microphone.

Zoom

Prior to the pandemic, the sole drawback of Zoom Cloud in comparison to other platforms was its access speed. After the epidemic broke out, Zoom Cloud's access speed significantly increased, and users started focusing on its instructional features. Zoom Cloud received high accolades for its relatively stable system, straightforward user interface, and simple operation during the pandemic. It worked better in group settings where individuals could freely had expressed and discussed their opinions.

2. E-learning platforms used only in universities

SuperStar Learning Pass

A mobile learning platform called SuperStar Learning Pass offered features for electronic review of literature, curriculum education, and conversations in groups. Although its teaching capabilities had increased since the pandemic's start, it still ranked last among the most popular platforms in terms of the caliber of video images, speed of video information transfer, and course management, and there were still many restrictions.

WeCom

Tencent WeChat Team created WeCom, a platform for workplace collaboration and commercial communication. This online platform was used in the universities of China during the pandemic. With greater personalization choices, WeCom offered the same communication experience as WeChat and integrates with WeChat every way. WeCom included features similar to those of Snapchat, including text messaging, voice messaging, broadcasting messages, video and conference calls, gaming, video and photo sharing, as well as location sharing.

3. E-learning platforms used only in schools

Yuanfudao (猿辅导)

This platform is one of the largest online education platforms in China, offered a wide range of online courses and resources for students of all ages. It provided a range of goods, including live instruction, an online question-and-answer database, and alternatives for testing mathematics problems. Through live streaming, they provided online education and home tutoring services under their distinctive logo. A group of qualified, experienced, and well-known national and international real-name teachers lead the tutorials. On its platform, almost 2 million of these students become paid members. Through the WeChat feature, parents or guardians also spoke openly with the teachers and asked about their children's academic achievement.

Zuoyebang

School students accessed Zuoyebang, an online learning application, where they watch live stream videos, found teachers for one-on-one Question & Answer sessions, and submitted assignments for review. Additionally, the website acted as a hub for parents,

teachers, and students to communicate. Students took photo of a problem, posted it to the app, and received the solution through Zuoyebang, which also offered online courses and conducted live lectures. According to the startup, it employed artificial intelligence to determine the query and its response. Primary and secondary school kids throughout the country were an ideal audience for Zuoyebang. It served as a thorough research tool for finding academic material as well as for practicing, learning, and conversation.

Xuexi Qiangguo

This is an E-learning platform developed by the Communist Party of China (CPC), offered a range of online courses and resources for students. The platform had been widely used for E-learning during the pandemic, providing students with access to high-quality educational resources.

Tencent Classroom, Yuanfudao, Zuoyebang, and Xuexi Qiangguo are some of the platforms for E-learning that have seen the most widespread adoption in China during the COVID-19 pandemic (Figure 3). Students have been given the opportunity to continue their education despite the fact that schools have been closed as a result of the platforms' provision of access to online resources and courses of a high academic standard.

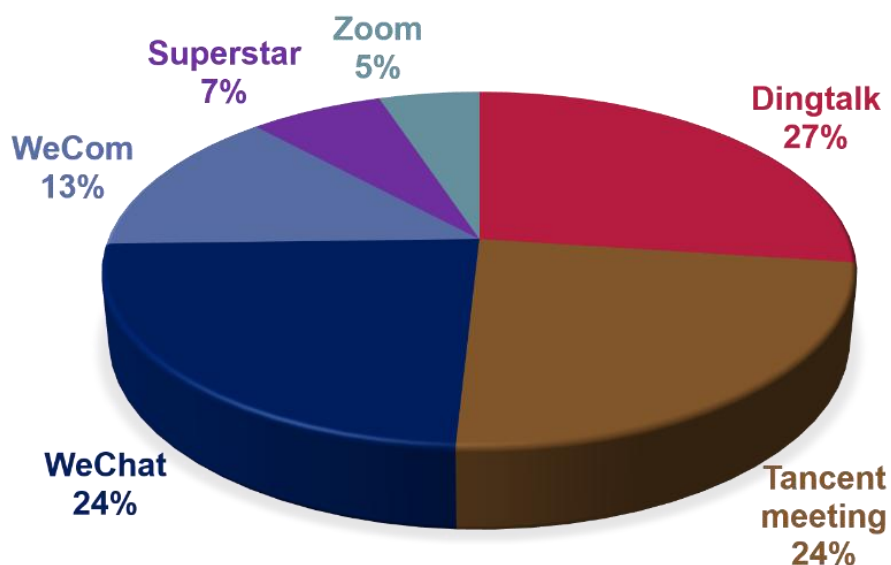


Figure 3. Percentages of different platforms

5. Conclusion

The pandemic's forced closure of educational facilities which boosted E-learning and the use of technology. The success of managing E-learning is associated with the contentment of the participants of E-learning. Course completion and academic achievement during E-learning shows the satisfaction of students as well as teachers and it is the proof of proper management of the journey of E-learning. The results of the research in one city of China reveals that the satisfaction and educational accomplishment justify the management of whole process of E-learning by the government of China. Utilizing various E-learning platforms ensures success.

Due to the growing popularity of E-learning throughout the pandemic, the entire field of education and learning has undergone significant transformation as well as the introduction of several technology applications and their consequences on student's satisfaction and academic success as online influencing elements, as research has shown that E-learning has a notable relation with both of these outcomes. Academic accomplishment and E-learning satisfaction were found to be related; students who used E-learning throughout the pandemic reported higher academic achievement levels. The study is consequential because it provides students and decision-makers with a new angle on how to be ready for the adoption of E-learning while ensuring student's satisfaction.

The Chinese government closed all educational institutions nationwide to stop the epidemic. E-learning became necessary in that time. The Chinese government has supported E-learning to keep learners engaged during school closures. The government has promoted online education and urged schools to use E-learning systems. They also trained teachers for online instruction. The Chinese government also implemented online exams, online projects, and other remote evaluation methods to address E-learning difficulties. They promoted E-learning, invested in technology, trained teachers, and implemented flexible evaluation systems to manage the school system during the COVID-19 outbreak. These approaches allowed Chinese students as well as foreign students enrolled in Chinese educational institutes, to continue their study during this difficult time.

All educational institutions in China adapted well-known regional platforms and tools to administer E-learning and distribute course materials. Through interactive teaching tools like message boards and videos, online instruction made more interesting and effective for instructors as well as learners. E-learning also falls under the category of flexible learning, allowing the learner to customize his study time to fit his schedule. Through observation and analysis, we discovered that, with the right techniques and tools to support interactions and communication, E-learning can be advantageous for both students and academic staff. China's 5G network infrastructure enabled speedy access to internet resources and real-time communication to ensure the quality of E-learning.

6. Limitations and future work

This study also has some limitations. First, a purposive sampling technique was adopted for this research. Participants should be randomly selected to gather rich discussion. Second, this research was done only in the educational institutes of one city in China, which didn't express the views of the entire population of the country. Future research can be carried out in other cities to gather detailed responses. A questionnaire can be added along with interviews to reflect society's view about online learning satisfaction as well as the problems related to E-learning during the epidemic.

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