Investigation and Insight into the Status of Large-scale Online Teaching during the New Crown Epidemic— Taking a University in Gansu as an Example

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Abstract: Large-scale online teaching is an important measure for universities to guarantee teaching progress during the epidemic prevention and control period, and an important way to achieve fair and homogeneous education. In order to comprehensively understand the real state of online teaching and improve the quality of online teaching, this paper investigates the large-scale online teaching in Gansu University of Political Science and Law in November 2021 and March 2022 respectively by questionnaires, and compares the results of the two surveys, analyzes the problems of online teaching under epidemic prevention and control, gives corresponding suggestions and response strategies, and provides important references for improving the quality of online teaching in local undergraduate institutions The results of the two surveys are compared, and the problems of online teaching under the epidemic prevention and control are analyzed.

1. Introduction

At the beginning of 2020, a sudden outbreak of Newcastle pneumonia broke the original teaching arrangement of colleges and universities, and in response to the call of the Ministry of Education to "suspend classes without stopping school" [1], the teaching of major colleges and universities across the country were switched from "offline" to "online". In order to respond to the call of the Ministry of Education for "stopping classes" [1], the teaching in universities nationwide has been changed from "offline" to "online". With the advantages of information technology, teachers quickly established an online teaching environment, which broke the spatial restrictions of teacher-student interaction and communication caused by the epidemic and ensured the normal teaching order and progress. The quality of online teaching has become a focus of concern.

In order to understand the status of online teaching, improve the effect of online teaching, and promote the teaching reform of universities, this paper takes Gansu University of Political Science and Law as an example, and investigates the large-scale online teaching activities in October 2021 and March 2022, which were required by the prevention and control of the new crown epidemic, and takes the teachers and students who participated in online teaching activities as the targets of the

survey[2]. The survey included the use of the online teaching software platform, the use of online teaching materials, the teaching format, the assignment and evaluation methods, the teaching effect, and the mentality in the teaching process. Through the analysis and collation of the survey questionnaires, the main problems were highlighted, the highlights were found, and suggestions and response strategies were put forward to provide experience for realizing better online teaching and improving teaching management and the online teaching system.

2. Research Subjects and Methods

Subjects: the subjects of the study were all students and faculty of Gansu University of Political Science and Law who participated in online teaching activities in two phases in November 2021 and March-April 2022. Due to the need of epidemic prevention and control, all the offline, online and offline mixed mode courses of the university were switched to online teaching in these two phases except for individual courses, involving about 10,000 students in four grades of 2018-2021 in 16 colleges, involving majors covering major categories such as law, literature and history, economics and management, arts, science and technology, etc. The teachers involved in online teaching included public basic courses, professional courses, and the teachers involved in online teaching include public basic courses, professional courses, and general education courses.[3]

Research method: In November 2021, the online teaching survey (teachers' version) questionnaire and the online teaching survey (students' version) questionnaire of Gansu University of Political Science and Law during the epidemic were randomly distributed to all teachers and students through the online platform of Questionnaire Star. 4532 student questionnaires were randomly distributed and 4532 were returned, 326 teacher questionnaires were distributed and 326 were returned. In April 2022, through the online platform of Questionnaire Star, we issued "Gansu University of Political Science and Law undergraduate online teaching quality student satisfaction questionnaire" and "Gansu University of Political Science and Law second semester of the 2021-2022 academic year online teaching questionnaire (teacher version)", the survey randomly issued 7420 copies of student questionnaires, 7420 copies were returned, 437 copies of teacher questionnaires were issued and 437 copies were returned. 437 questionnaires were returned.

The data from the two surveys were collated and compared, and the main problems were summarized and analyzed, and the problems were corroborated from the perspectives of students and teachers, and corresponding suggestions and measures were put forward.

3. The main problems

By collating and summarizing the questionnaires collected, more than 90% of teachers and students participated in online teaching activities, and the problems about online teaching were mainly focused on the following aspects.

3.1 Insufficient network infrastructure carrying capacity

In the survey of student questionnaires, the most prominent problem was the poor network and network lag. Due to the sudden outbreak of the epidemic, the whole school was closed and all students could only study online in the dormitory. To avoid confusion and conflicts in teaching time, the online teaching time was synchronized with the original offline teaching time, which resulted in a large number of students using the same teaching platform and wireless network at the same time, thus causing lagging and delay. Although the impact of the network on teaching and learning has been significantly reduced compared to the network crash at the beginning of the epidemic in early 2020, in the 2021 student survey, more than 46% of students thought that the network speed needed to be

improved in the question "What would you like to improve about the current online teaching and learning situation? In the other question, "What do you think is the reason for poor teaching effect", more than 50% of students think that the network lag is the reason for poor learning effect. Internet speed, teaching platform carrying capacity and related hardware equipment become an important factor limiting the effectiveness of online teaching.

3.2 The number of online teaching platforms is on the high side

In the two stages of the questionnaire survey, the survey on "the name and number of teaching software platforms used" found that teachers and students used more than 7 online teaching platforms, such as Nails, Learning Pass, Tencent Classroom, Rain Classroom, QQ Group Live, etc., during the whole teaching process, but the majority of platforms used by each teacher were two. The statistics of students found that 22.8% of students used 4 or more teaching platforms at the same stage, which indicates that students will frequently switch platforms in the learning process.

Before the epidemic, the university had carried out training on the use of online teaching software in order to promote teaching informatization and strengthen the construction of online courses, but did not limit the number and names of teaching platforms used. Increased. More teaching software platforms will cause students to spend more time and energy learning how to use the platform, causing learning pressure, more software will also take up hardware resources, and frequent switching of teaching platforms will also bring students irritation [4], reducing students' satisfaction with online teaching and teaching effectiveness [5]. This is also evidenced by the survey on "reasons affecting learning effectiveness" in Figure 1. In mechanical and electronic engineering, a major role of intelligent robots is to correct errors and maintain mechanical and electronic systems, to correct faults in them and to maintain the performance of intelligent robots, and fault detection is also more accurate, faster and easier. In practice, mechanical and electronic engineering data is entered into the operator interface, and accurate inferences can be made about the location of faults by intelligent robots, making it easier for staff to maintain them. At present, there are three main methods of intelligent robot fault detection, namely rule-based reasoning, case-based reasoning and fault diagnosis. In practice, mechanical and electronic engineering controls become unstable due to relevant factors, easily leading to information system failures and incorrect information transmission. With the use of intelligent robotics, the error generating principle can be quickly discovered and the interpreter agreed to explain the fault reasoning and basis.

3.3 Single form of online teaching

In the survey of teachers and students on "online teaching formats", it was found that the rate of teachers using live streaming platforms for online teaching was high, with 76.48% of teachers using live slides in the November 2021 survey and 92.68% in the April 2022 survey. professional teaching platforms such as Learning Connect and Rain Classroom is not sufficient. The current live teaching is affected by teaching time and Internet speed, the interactive link is not immediate enough, in order to ensure the progress, some teachers use slides live, and there is no substantial interaction, students only receive information one-way, which is very likely to lead to boring teaching, especially in the online teaching environment with insufficient supervision will lead to the teaching effect can not be guaranteed.
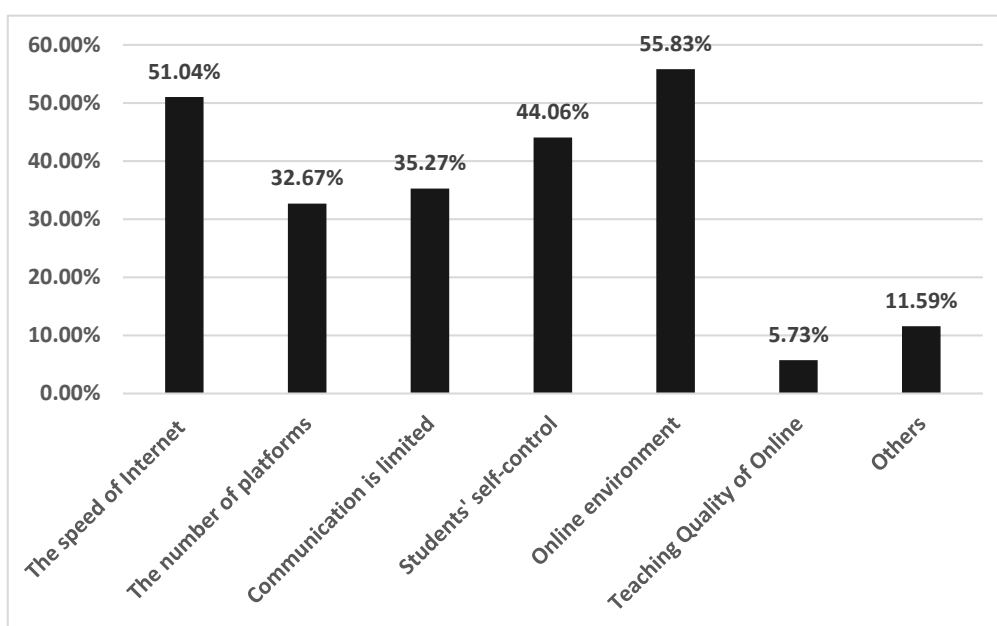
Figure 1 Reasons students believe affect learning effectiveness

On the other hand for students, the number of online teaching doors, online live time is too long, 2021 survey shows more than 6 doors for 46%, and 2022 survey shows that the average daily online live learning of students more than 6 hours 44.89%, the surveyed students are in accordance with the class schedule in the specified time to complete, the results show that students generally believe that a long time single online live teaching will cause Physiological and psychological stress, dry eyes, cervical discomfort, etc., students reject online teaching and the learning effect decreases.

In the survey of teachers about the length of online teaching, it was found that more than 77.40% of teachers think that the online teaching time should be compressed, and if the interaction cannot be realized instantly during the live broadcast, the form of recorded lessons should be adopted. 43% of teachers think that the original 50 minutes of a small lesson should be compressed to about 35 minutes, which can avoid long and ineffective live learning, and leave students thinking and self-learning This can avoid long and ineffective live learning and leave students time for thinking and self-learning. Adopting the recording method or designing other forms of online teaching can effectively compress the length of online teaching, but it will inevitably take more time and effort to design online teaching, which poses a new challenge to the teaching mode.

3.4 Inadequate online teaching evaluation methods

Compared with traditional offline teaching, online courses not only break through the limitations of space and even time, but also realize the large-scale sharing of high-quality teaching resources, which is what traditional offline teaching cannot compare with. However, in the traditional offline teaching process, teachers and students face each other, interaction and communication are very convenient, especially in the case of small class teaching, teachers in the teaching process through eye contact, tone of voice, question and answer interaction and other ways to understand the students' mastery of classroom content, to achieve real-time fine-tuning of the teaching schedule. In contrast, it is almost difficult for teachers to obtain real-time feedback on teaching during online teaching activities, which is clearly reflected in the April 2022 evaluation about teachers' evaluation of teaching effectiveness, where 79.41% of teachers think the biggest difficulty of online teaching is that they cannot communicate with students instantly and cannot grasp students' situation well. And the atmosphere of online teaching is not as good as offline, and students' self-control is not enough, so a

timely and perfect evaluation feedback system becomes an important insurance to ensure the quality of online teaching.

Table 1 Evaluation criteria questionnaire

Availability of evaluation criteria	Ratio
There are standards that are recognized by experts for auditing	10.29%
There are standards developed by the course team itself but not reviewed by experts	27.21%
There are standards developed by individual teachers themselves but not reviewed by experts	16.18%
No clear criteria	46.32%

Feedback and evaluation of teaching through assignments is a common way in the whole process of teaching activities, and the feedback of online course teaching evaluation during this epidemic was not satisfactory, as shown in Table 1, about 46.32% of instructors did not know or did not have evaluation criteria for online courses, 40.44% of instructors thought that assignments were well laid out and not well evaluated, 10.49% of students thought that the difficulty of 24.23% of students thought that the homework increased, all of which indicated that online homework assignment and evaluation were not well constrained, and the final results showed that online teaching as a whole did not achieve the effect of offline teaching, as shown in
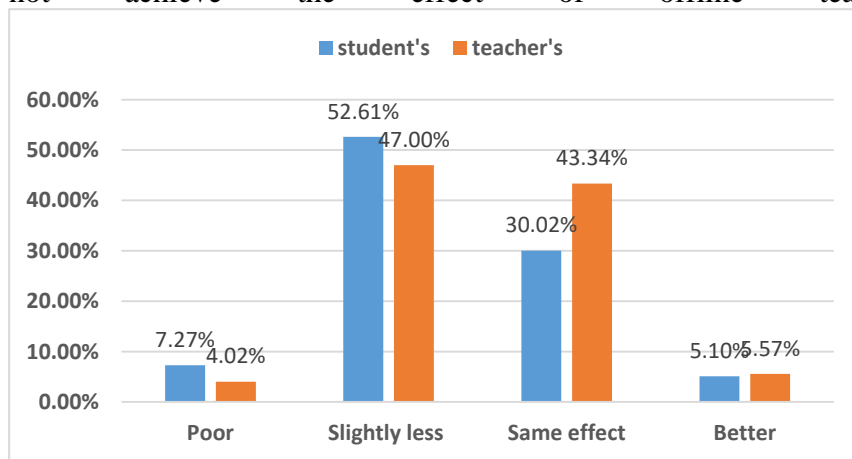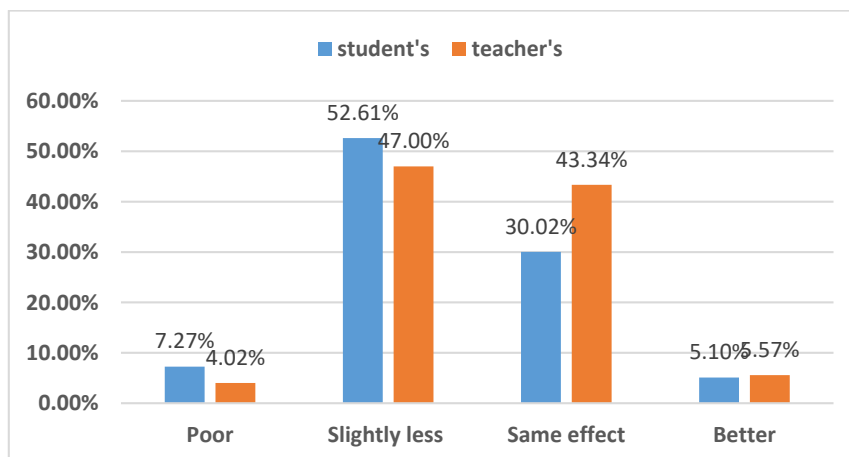

Figure 2.

Figure 2 Online teaching compared to offline chart

4. Recommendations and Countermeasures

4.1 Attach great importance to online teaching software and hardware security

Online teaching is not a new teaching mode, but in the special context of the epidemic, many problems and shortcomings of online teaching, especially large-scale online teaching, have been discovered and magnified, despite the many drawbacks, it is undeniable that the information-based teaching caused by online teaching has taken a qualitative leap, and online teaching will not be used only for emergency situations in the future, but will definitely become a teaching norm and In the future, online teaching will not be used only for emergency situations, but will become a normal teaching practice and gradually spread to all kinds of distance training, learning, and conferences outside of full-time teaching. Without hardware infrastructure and good network support, there is nothing to talk about. While building campus network to serve teachers and students' general study and work, schools should fully consider the application situation of large-scale online teaching, reasonably plan and design network construction, and make up for the shortcomings and loopholes exposed during the epidemic. On the other hand, we should strengthen the guidance and management of online teaching platforms, guide students and teachers to use online teaching platforms that are easy to manage in a unified manner, and at the same time increase the development and improvement of platforms that are applicable to them, so that the platform functions and the use of teachers and students can be integrated and give full play to their respective roles. Using a unified teaching platform is not only good for management, but also convenient for designing teaching evaluation and feedback management programs based on specific teaching platforms, making online teaching within the school's controllable management scope and making it truly an effective teaching mode and means.

4.2 Teachers should accelerate their personal role change and improve their information literacy

The large-scale online teaching spawned by the epidemic once again shows that online education is very different from face-to-face education in terms of philosophy, methods, conditions, and management; it has the characteristics of general online teaching, but also has its own rules in the course of curriculum design and implementation, and in the face of new technologies and complex environments that are constantly iterating and changing, teachers are required to change from their traditional role to one of constantly learning how to design teaching activities, how to guide and supervise teaching and learning activities in new environments, and use new skills to teach knowledge as a lifelong learner [6]. It has been proven that when information technology provides the material basis for educational change, it is feasible to use online education to realize "stopping classes and not stopping learning", but whether teachers' roles can be changed in time and whether their personal information technology literacy can be followed up in time is the key to the successful implementation of modern information teaching.

The survey found that a significant percentage of teachers refused to teach online after the epidemic because of the "poor effect of online teaching", while 24.15% of teachers thought that online teaching was difficult, time-consuming, and time-consuming. Another reason is that teachers need to learn new skills to implement online teaching, and some teachers are inert and resistant to learning new knowledge and skills. However, the survey on "teaching role" found that more than 40% of teachers admitted that the current role of teachers had changed somewhat from what they thought it was, and that teachers should learn more about online teaching skills. The survey on teachers fully indicates that a large proportion of teachers have yet to improve their understanding and ability of information-based teaching, and they do not realize that online teaching will be an important form and trend of teaching in colleges and universities in the future, and they should take online teaching

under the epidemic as an opportunity to improve their understanding of online teaching and eliminate resistance and inertia. Awareness, exclude resistance and inertia, with a positive mindset to strive to practice the ability to build online courses and the ability to teach online, and constantly explore in order to produce wonderful online courses and get the praise of students, so that they can also fundamentally change the situation of a single form of teaching and dull teaching effect.

4.3 Establishing standardized and applicable online teaching evaluation criteria

The core of whether offline courses can be taught online is whether the quality of online teaching can reach or even outperform offline teaching while consuming the same resources. According to the statistics of two surveys, about 43% of teachers and about 30% of students think they can achieve the same teaching effect as offline, and about 5% of teachers and students think it is better than offline, and they think that for online teaching to get the same teaching effect They think it costs less resources to get the same teaching effect for online teaching, and this is the part of the course that has expert-approved course evaluation criteria and student feedback system. For those courses that are not considered to be of the same quality as offline, it is more the lack of course evaluation criteria that is the cause, so it is possible to improve the quality of online teaching by establishing reasonable and applicable course evaluation criteria.

On the one hand, it refers to the effect achieved by the course teaching, which is consistent with the offline teaching goal and can be measured by the already perfect offline course evaluation standards; on the other hand, it refers to the students' feedback evaluation of the course, such as the feedback on the important and difficult points of the course content, which is consistent with the offline content, but because the teaching format itself has changed significantly. This is the main root problem that the quality of online teaching is not as good as offline teaching in this survey. Online teaching students' learning behavior is not monitored, and teachers can no longer obtain students' understanding of course content through students' immediate feedback as in offline, but more through online feedback and evaluation, which will definitely cause a lot of "water lessons" and affect teaching quality. The establishment of a standardized and applicable online teaching quality evaluation system is not only an important guarantee of online teaching effect, but also an inevitable demand for school teaching management, especially with the repeated epidemics and the deepening of online course construction, this demand is more urgent, and it can be based on the national standard of "Information Technology Learning, Education and Training Online Course", and refer to the combination of relevant online " The feedback evaluation design from three aspects, such as construction effect, course teaching application and teaching effect, can be based on the national standard of "IT learning, education and training online course" [7], and refer to the combination of relevant online "fine course" production method, and invite third-party experts to review and establish a suitable course evaluation system.

4.4 Establish a perfect and applicable online teaching management system

Due to the recurrence of the epidemic and the need for prevention and control, large-scale online teaching has also been repeatedly carried out. With new technologies supporting the teaching model constantly iterating, it must be acknowledged that online teaching will definitely become a new trend in the near future, and only by keeping up with the new trend can we not fall behind in teaching skills, and the best way to ensure the quality of teaching in this model is to establish a long-term management system corresponding to it The best way to ensure the quality of teaching in this mode is to establish a long-term management system that corresponds to it. A perfect online teaching system is good for guaranteeing the normal teaching order, facilitating the unified scheduling of resources for the whole school by teaching managers, and improving the teaching effect and supervision.

First of all, the purpose of establishing a system is to better achieve higher quality teaching, and this purpose can only be achieved gradually through practice. Therefore, the construction of online courses should be strongly encouraged and supported, and teachers who actively improve their information technology literacy should be given incentives in terms of title evaluation and merit assessment, so as to stimulate and encourage teachers to improve their information technology skills and make them, especially young and middle-aged teachers, proficient in this survey, there are many messages and suggestions from teachers.

Secondly, by establishing a system to make information-based teaching skills training a norm, teachers can be bound by a credit system to strengthen their learning of online teaching skills, such as teachers learning to watch the training or demonstration of online courses by famous teachers organized or recommended by the school, and the management finally certifies teachers' learning in the form of credits as the result of annual teacher training.

Finally, while teachers are trained in online teaching skills they should also pay attention to strengthening guidance and discipline for students using the online platform, instructing students how to improve their online learning skills through collective mass training or lectures, guiding students to adapt and strengthen their skills for online learning, establishing a system of rewards and punishments for students' self-control assessment, fostering self-learning, and enhancing offline self-control.

5. Conclusion

In this paper, we analyze and summarize the data of the current situation of two closed online teaching sessions in Gansu University of Political Science and Law due to the need for the prevention and control of the new crown epidemic, sort out the problems and shortcomings of online teaching in general local undergraduate institutions, and make targeted suggestions to strengthen teachers' informatization literacy, accelerate teachers' role transformation, and establish an applicable online teaching evaluation system and system. In the post-epidemic era, online teaching will be an important form of teaching. We should take this large-scale online teaching activity as an opportunity to bravely face the challenges brought by online teaching, seize the opportunities, and seriously study and analyze how to better design and implement online teaching. The survey analysis and suggestions made in this paper have reference significance for general local institutions in improving the quality of online teaching and improving teaching management.

Acknowledgement

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