Research on the Quality of Universities' Online Teaching and Its Improvement in the Era of COVID-19

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Abstract

The new crown epidemic has caused major changes in teaching methods in colleges and universities. As more and more courses begin to be transformed into online teaching models, how to ensure the quality of online teaching has become the primary problem to be solved. This article uses the methods of literature research and questionnaire research to study the quality of online teaching. Among them, the questionnaire survey is based on the perspective of college students, collecting and analyzing their feedback on the quality of online teaching. Through the three dimensions of platform, teachers, and students, it analyzes the existing problems of online teaching, and proposes targeted improvement suggestions, which have certain guiding significance for related research on the improvement of online teaching quality.

Keywords

Online teaching; Teaching model; College teaching.

1. Introduction

With the continuous development of information technology, the teaching model which combines the Internet and education has exerted a significant influence in the field of education. As an emerging teaching mode, online teaching has broken through the limitations of time and space, and has the characteristics of convenience, efficiency and flexibility. In recent years, with the further development of information technology, online teaching has also entered a stage of vigorous development. China's online education market and user scale continue to expand.

At the beginning of 2020, the new crown pneumonia virus raged across the country, which had a great impact on the offline teaching activities of various universities across the country. In order to block the spread of the virus, various universities across the country also launched large-scale online teaching activities. According to statistics, there are a total of 1454 colleges and universities have launched online teaching activities, 1.03 million teachers have offered 1.07 million courses online, and a total of 17.75 million college students are studying online. In the context of the epidemic, the popularity of online teaching has been pushed to unprecedented heights. However, online teaching also has problems such as insufficient preparation of teaching conditions, lack of personalized teaching platforms, and insufficient online teaching experience of teachers. With the recurrence of the new crown pneumonia epidemic, it is foreseeable that the online teaching model will play an increasingly important

role. Therefore, it is important to clarify the problems in online teaching and propose targeted and feasible suggestions to improve the quality of online teaching value.

From the perspective of education itself, education has the dual function of promoting social development and promoting individual development. The essential attribute of education is transitivity, that is, to convey culture and civilization through education. Teachers and students are the two main bodies of educational activities. Among them, teachers play a guiding role in educational activities, and students' evaluation of teaching effects is an important indicator of teacher's teaching quality.The purpose of this research is to investigate online teaching quality surveys and improvement paths in colleges and universities in the era of epidemics. Unlike offline teaching, online teaching has the characteristics of digitization and informatization. The evaluation of online teaching quality requires a student's perspective from teachers and online. The three dimensions of the online education platform and the students themselves are used to evaluate teaching, so as to clarify the difference between online teaching and offline teaching and explore possible factors that affect teaching quality in online teaching activities. Based on the research purpose of online teaching quality investigation and improvement path in colleges and universities in the era of epidemic, this study uses questionnaire survey method as a research method to summarize and classify factors that affect online teaching quality, and propose teaching and management suggestions for important influencing factors.

2. Literature Research

This research mainly focuses on online teaching in colleges and universities to conduct a literature survey. CNKI is a document retrieval database platform for this research, combined with web news and other channels to collect relevant data. The search keywords are "epidemic", "university", and "online". "Teaching", "Essence of Education" and "Evaluation of Teaching Quality" can fully understand and master the current status of relevant research. Because of the special background of the new crown epidemic and the latest development of comprehensive online teaching technology, in addition to basic pedagogy-related research, the remaining document years are limited, and only documents after 2019 are selected to ensure that the documents have the current research background Reference value. By understanding a certain amount of online teaching research literature in colleges and universities during the epidemic period, it can be concluded that there are related literature research directions, mainly discussing teaching practice and enlightenment, and explaining the advantages, existing problems and theoretical suggestions of online teaching from the perspective of teachers. These aspects. At present, the research field of proposing targeted and feasible improvement measures for online teaching problems in colleges and universities during the COVID-19 epidemic is in a relatively blank state. In particular, finding online teaching problems from the perspective of students and making suggestions has no relevant results.

3. The Questionnaire Survey

In order to explore the specific situation of online teaching from the perspective of students, our research team conducted a questionnaire survey and analyzed the relevant contents.

3.1. The Survey Object

The sample of this questionnaire survey includes 110 undergraduates from many universities in China and abroad, mainly Chinese domestic undergraduates, with a male to female ratio of 4: 6.

3.2.   The Status of Online Teaching

Figure 1 below shows the teaching mode of online teaching including five forms at present: live class, live class supplemented by recording and reviewing, recording and broadcasting class, online group chat and self-study by using online resources, among which the mode of live and recording is the most common. Although there are various forms of online teaching, students come into contact with live lessons most frequently when they study online as shown in Figure 2. The defect of live lessons lies in the teacher's lack of recording of live lessons, and students can't review them. From the students' satisfaction with the online teaching mode in Figure 3, the online teaching mode of live broadcast and recording is the most popular, and there is a certain demand.
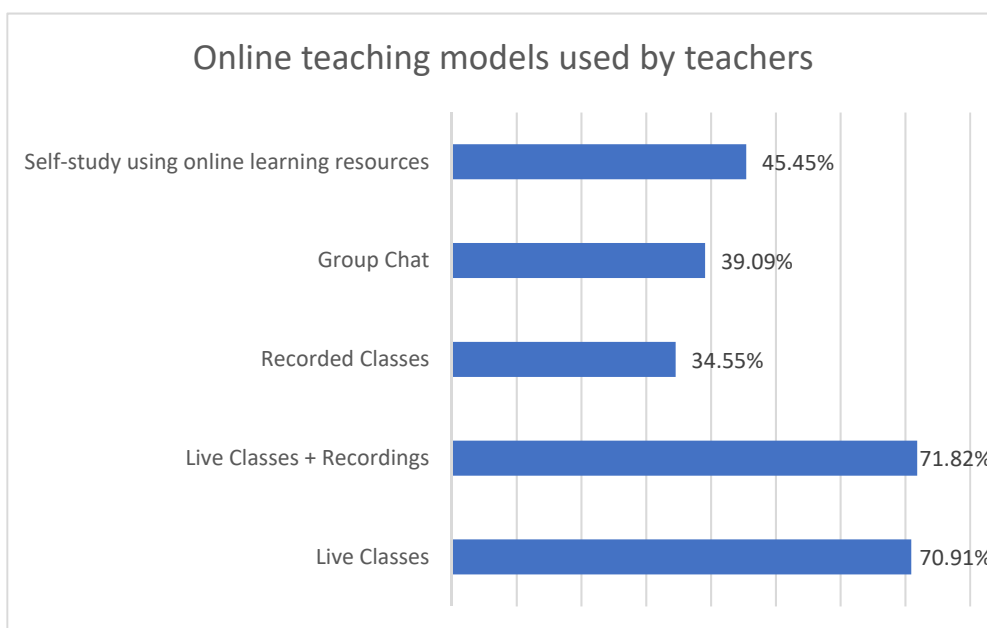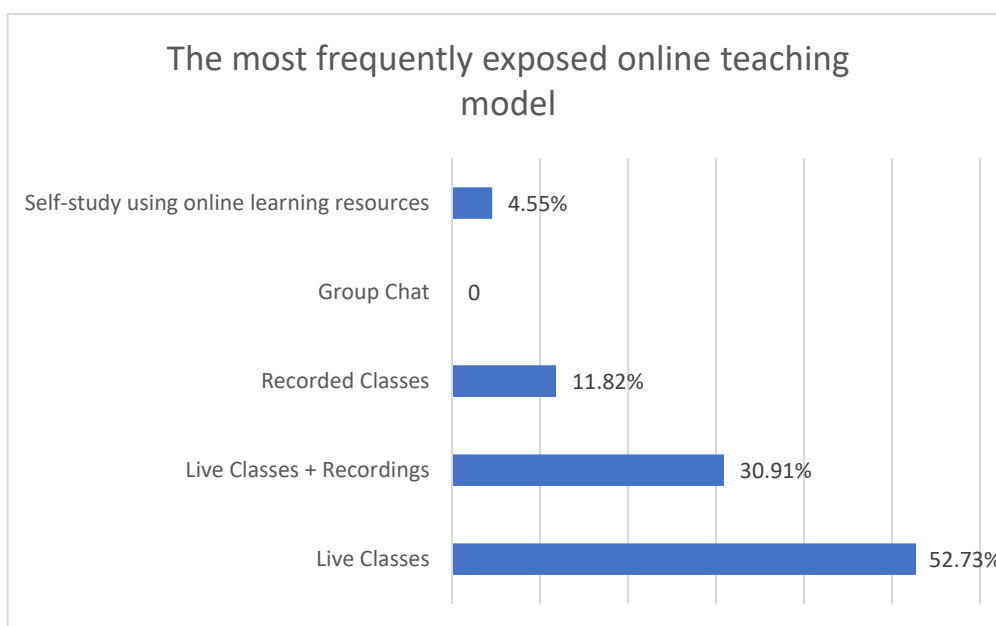

Figure 1. Major online teaching models

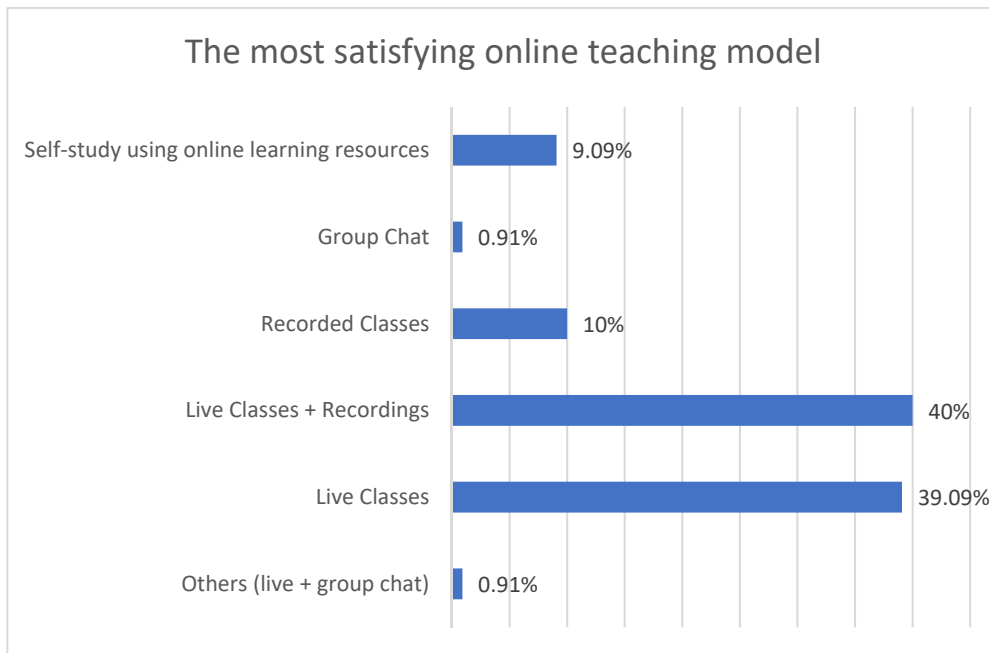**Figure 2.** The most commonly used online teaching model

Figure 3. Which online teaching mode students are most satisfied with

According to the feedback on the recognition of online teaching, most students (about 64%) prefer online teaching compared with offline teaching, but the learning effect between online learning and offline learning is not obvious. The number of people who think that online teaching has better learning effect than offline teaching and the number of people who hold the opposite view are 50%, and 70% of students think that online teaching can't replace offline teaching. We think online teaching is just an auxiliary means for offline teaching. (All the data in this section are shown in Figure 9)

On the other hand, the three important subjects involved in online teaching platform, teachers and students, all have certain problems and can be improved. As shown in Figure 4, most of the students (about 74%) mainly think that the problems related to online teaching platform should be improved.
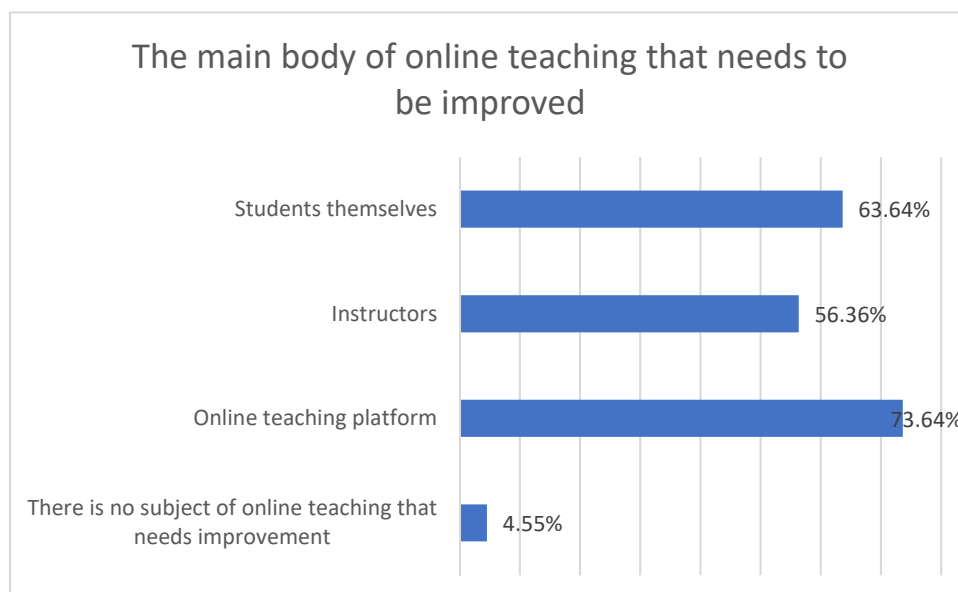

Figure 4. Online teaching bodies that need to be improved

3.3. The Advantages of Online Teaching

Compared with offline teaching, the advantages of online teaching are relaxed and quiet class atmosphere, some courses support online review and repeated learning, great convenience in learning time and space, more diversified teaching methods and available learning resources. The main advantages of online teaching shown in Figure 5 are the ability to learn video or live recording courses repeatedly, and the flexibility of time and space.
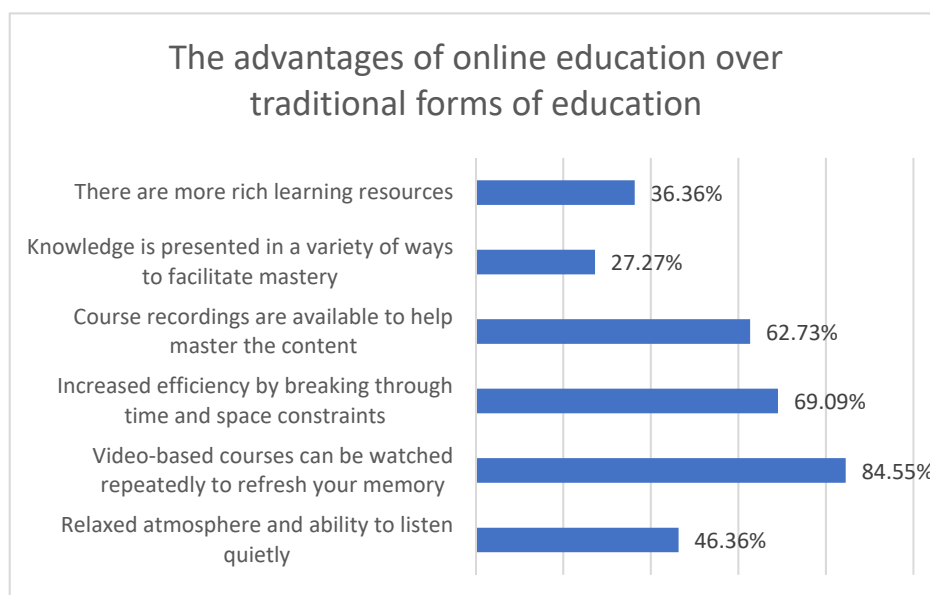

Figure 5. Comparative advantages of online and offline teaching

4. Problems in Online Teaching

4.1. The Number of Online Teaching Platforms

We have learned before that different teachers often use different education platforms, which will bring higher learning costs and great troubles to students. After the questionnaire survey, the vast majority of students (about 85%) think that teachers' use of different platforms will bring different degrees of distress. (All the data in this section are shown in Figure 9).

4.2. Perfection of Online Teaching Platform Functions

Most students fully agree (26%) or quite agree (46%) that the improvement of the platform can effectively improve the quality of online learning. This shows that students are still dissatisfied with the status of the platform, and they think that the platform should add or improve functions to promote the quality of online learning. According to the students' choice, it can be seen that the existing platform functions include several important aspects. As shown in Figure 6, most of the students (56%) think that the homework system functions need to be improved. 45% of the students think that compared with offline teaching, the team cooperation system in online teaching has some shortcomings. It is difficult to carry out team cooperation in online learning. In addition, a small number of students (below 40%) think that there are defects in the platform's teaching page locking function, punch-in function before and after class, roll call before class and classroom scoring system.
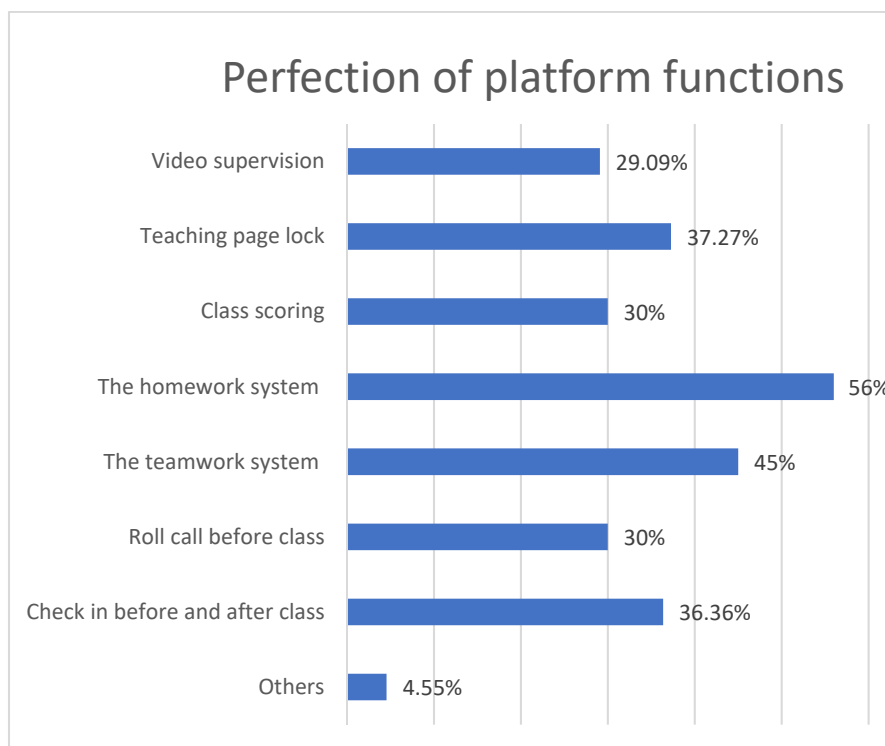
Figure 6. Platform function improvement points

4.3. Lack of Online Teaching Experience

Online teaching, as a new teaching mode, is highly integrated with information technology, which puts forward higher requirements for teachers' teaching skills. The outbreak of the COVID-19 epidemic has promoted the large-scale popularization of online teaching in colleges and universities, but it is also because of the sudden outbreak of the epidemic that teachers carry out online teaching activities without sufficient online teaching experience. Compared with offline teaching, teachers' teaching attitude has not been affected. More than 94% of students think that teachers can carry out teaching activities in strict accordance with the prescribed time, but teachers' familiarity with platform functions is different. Only 5.45% of the students think that teachers are fully familiar with the functions of online teaching platform, most students (60%) think that teachers are partly familiar with the functions of online teaching platform, and about 18% of the students hold a negative evaluation of the familiarity of teachers' platform functions. The lack of online teaching experience and related training will hinder the smooth development of online teaching activities for teachers, thus affecting the quality of online teaching. (All the data in this section are shown in Figure 9).

4.4. Online Teaching Strategies and Teaching Methods

Different from traditional offline education, online teaching content is characterized by electronization, digitalization and networking. Teachers need to determine teaching strategies and methods according to the unique characteristics of online teaching and taking advantage of online teaching advantages. In online teaching activities, most teachers have combined online learning resources to carry out teaching activities, and nearly 70% of students recognize that teachers have combined more or even rich learning resources. At the same time, more than 93% of students agree that teachers can arrange teaching progress reasonably and achieve teaching goals in time. However, the lack of teacher-student interaction and the delay in answering questions in online teaching also reflect that teachers' online teaching strategies and online teaching methods still need to be improved. Compared with offline teaching, online teaching is a teaching mode combined with the Internet. In the course, students can interact with teachers in real time to receive knowledge and solve confusion. However, nearly 50% of

the students think that compared with offline teaching, teachers do not make use of the advantages of online teaching to promote the interaction between teachers and students, and another 42% of the students think that the advantages of online teaching in informatization have not been brought into full play, and teachers cannot solve students' problems in time. (All the data in this section are shown in Figure 9).

4.5. Students' Online Learning Interaction

In the analysis of students' learning problems of video supervision course, many students (about 62%) agree that this behavior can play a supervisory role, and most students (about 82%) think that online learning reduces the interaction and cooperation among students. Most students (about 75%) think that online learning will weaken the competitive atmosphere. This shows that online teaching may have the problem of insufficient interaction between students compared with offline teaching, which has a negative impact on students' learning. (All the data in this section are shown in Figure 9).

4.6. The Receiving Effect of Students' Online Learning

At present, most students (about 86%) think that this will affect their study because teachers can't check students' learning in real time. For example, compared with offline teaching, it is more likely to cause distraction. Figure 7 below shows that, among the difficulties encountered in online learning, most students (about 68%) think that online teaching will lead to bad network conditions, some students (about 51%) think that teaching materials or learning materials will be lacking in the process of online teaching, and some students (about 47%) are unfamiliar with or unable to adapt to learning software applications.
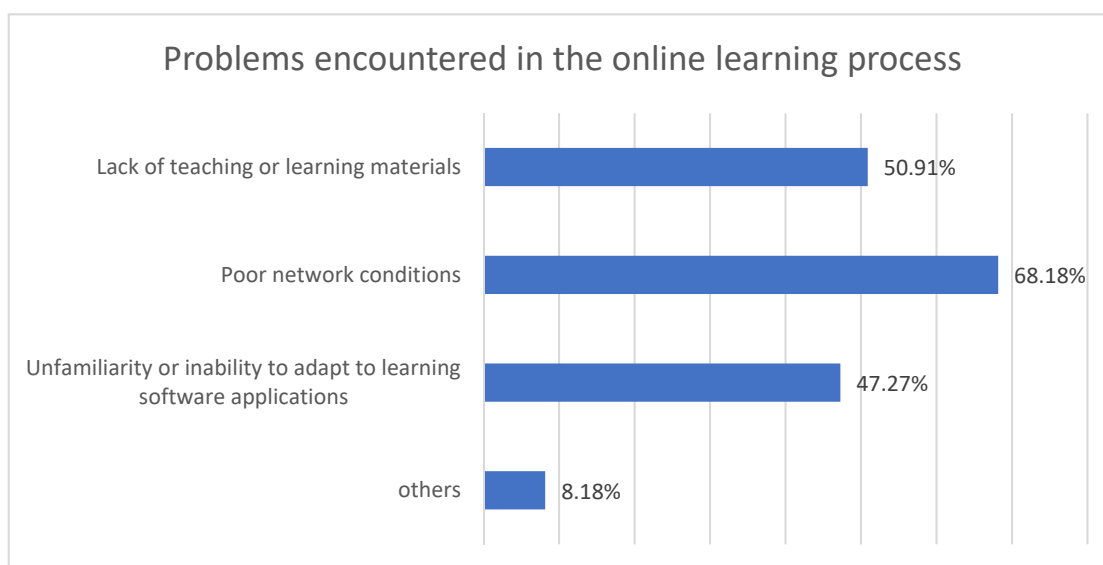

Figure 7. Problems with online learning

5. Situations of No Outstanding Problems

5.1. Students' Initiative in Online Learning

In the analysis of students' participation in the course, we found that the vast majority of students (about 94%) can enter the classroom completely or basically on time, and only a small number of students can't enter the classroom on time, which shows that most students know the schedule of online courses and are willing to enter the classroom at the time specified in the course. In the analysis of students' curriculum situation as shown in Figure 8, most of the

students (about 81%) can listen carefully. This shows that most students take an active attitude towards online learning.
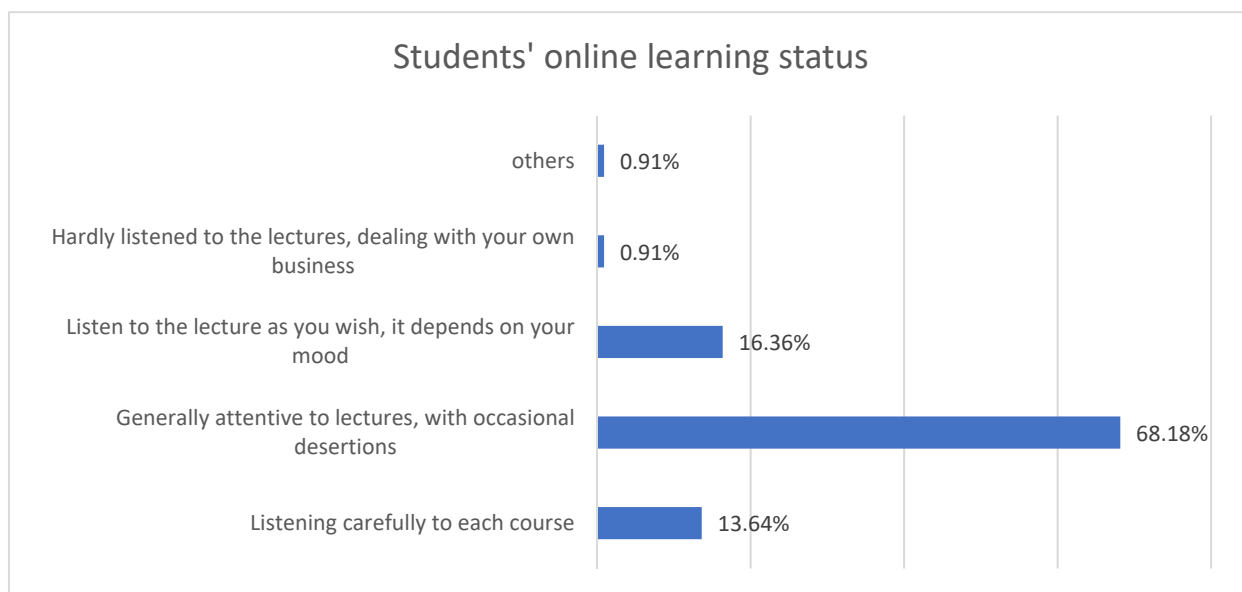

Figure 8. Students' concentration in online learning

5.2. Ease of Use and Stability of the Online Teaching platform

When doing related literature research, we think that the stability and ease of use of the learning platform may affect students' learning experience or learning quality in the process of using various online education platforms. However, we found that the vast majority of students agree (47%) or generally agree (25%) that the current platform is easy to use, and only a small number of students think that the learning platform is difficult to use. This shows that most students think the platform is easy to use. Platform stability issues are similar.

Note: For the answers to the above questionnaire questions related to the degree of identity, we have made a special chart (Figure 9) to show below.

6. Recommendations and Inspections

Based on the online teaching problems and specific improvements extracted from the feedback of the questionnaire results in the previous article, we put forward targeted and practical suggestions for the online teaching platform and the teaching teachers. The problems were improved separately to enhance the students' sense of online learning experience and learning effect, and to further effectively improve the quality of online teaching. And we have also designed a scoring tool specially used to test the improvement of online teaching quality. The comparison of scores can reflect the changes in online teaching quality before and after the suggestion.

6.1. Suggestion

6.1.1. For the Platform

Research and develop a dedicated platform for online teaching in colleges and universities, and improve relevant teaching functions.

In the era of the epidemic, online teaching platform technology is booming. At present, online teaching platforms on the market are mainly divided into two categories, including conference-based platforms represented by Tencent Conference and Zoom, and teaching-based platforms represented by DingTalk and Xuexitong. The conference platform has the advantages of simple pages, convenient and direct meeting creation, but the lack of teaching functions is obvious. The

teaching platform has more professional teaching functions, but its page layout has the problem of complex and messy. Different online teaching platforms have obvious advantages and disadvantages. At present, there is a lack of dedicated online teaching platforms with professional teaching functions and simple and easy-to-use pages. According to the feedback of the questionnaire survey results, in order to better carry out online teaching activities, it is necessary to develop a system that combines pre-class roll-in, pre-class check-in, class scoring, complete homework system and teamwork system, platform teaching page lock and teacher-student two-way A dedicated online teaching platform for colleges and universities with functions such as video supervision. At the same time, the platform needs to properly classify the above functions for the convenience of teachers and students.
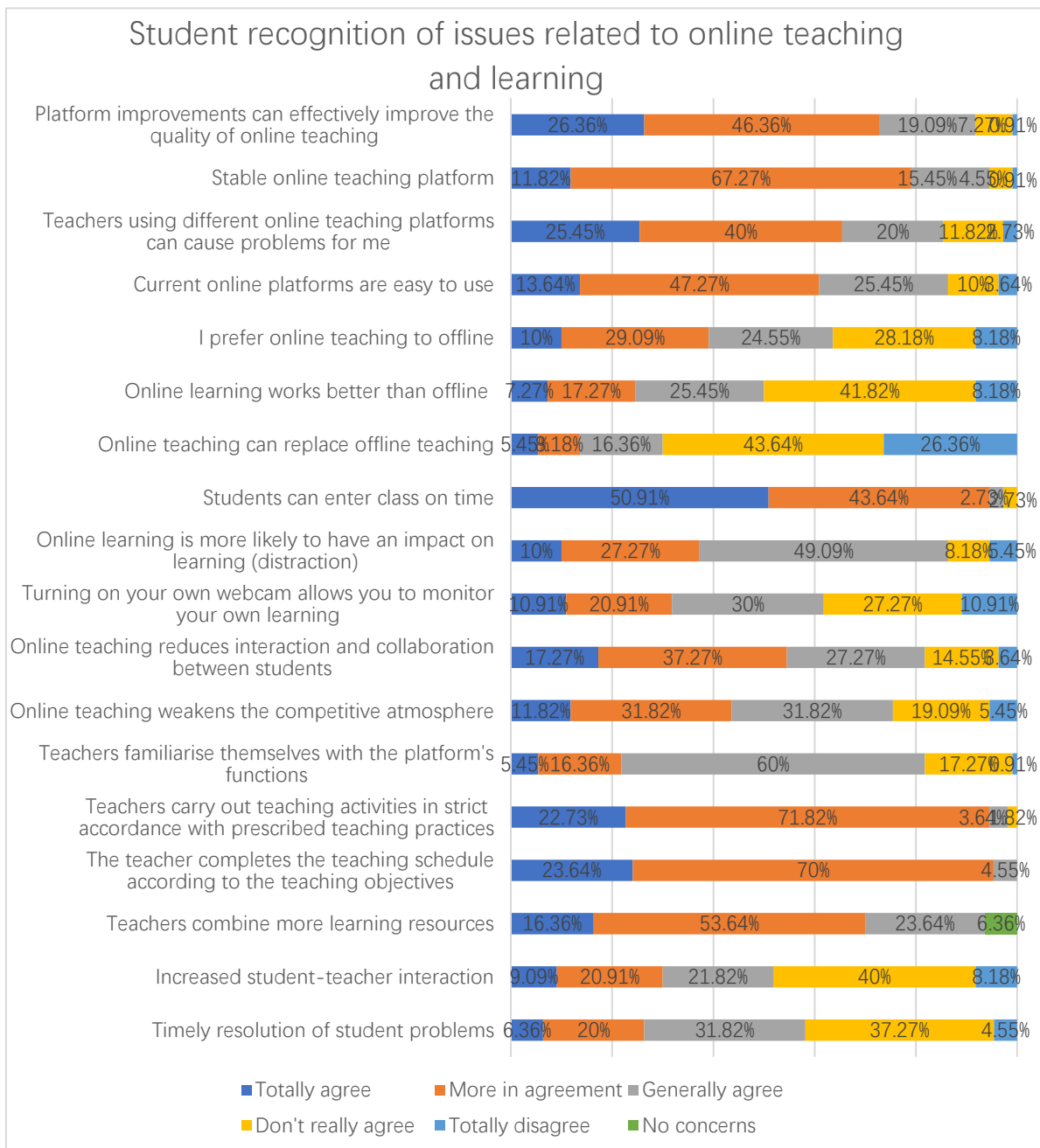

Figure 9. Data statistics on the recognition of online teaching questions throughout the whole questionnaire

6.1.2. For the Teachers

a. Change teaching strategies and teaching habits

From offline teaching to online teaching, teachers need to change teaching strategies and teaching habits according to the characteristics of online teaching. Unlike offline single face-to-face teaching, the Internet has multiple learning resources, and different learning resources can help students understand the subject knowledge from all dimensions. Teachers need to make full use of Internet technology and online learning resources to design teaching plans and rationally arrange classroom teaching structures according to the needs of students. In the process of online teaching, teachers not only need to highlight the key content of the lecture, and output knowledge clearly; they also need to change the traditional offline teaching habits and actively adapt to the online teaching mode. Teachers need to use a wealth of multimedia tools to make clear and reasonable blackboard writing, and select reasonable teaching media to help students understand and digest knowledge. In order to truly realize teaching and learning, teachers also need to change the traditional teaching strategy that focuses on students mastering knowledge points, use online teaching tools, design course-related questions, and set them to be sent regularly during each period of the course to attract students to participate in the classroom. Improve students' concentration in class; in order to promote students' independent learning and stimulate learning initiative, teachers can strictly control the personal teaching time, set up questions that can trigger divergent thinking, and guide students to think innovatively.

b. Improve online teaching supervision channels

The existing online teaching model is embodied as a "one teacher to many students" model. Compared with offline teaching, teachers and students carry out teaching and learning activities in separate spaces. Among them, teachers are in a dominant position and have greater autonomy in the development of teaching activities. There are some problems in online teaching that some teachers fail to carry out teaching activities in strict accordance with the prescribed time, cannot effectively judge students' learning attitudes, and cannot receive students' course feedback in time. In this situation, improving online teaching supervision channels is of great value, and online teaching supervision channels need to include two-way supervision between teachers and students. Therefore, teachers should select and allocate curriculum assistants in the process of carrying out teaching activities to promote the two-way understanding between teachers and students. As a bridge of communication between teachers and students, course assistants play a role in urging teachers to carry out teaching activities on time, informing students of online teaching arrangements, collecting problems that students find difficult to solve, and giving teachers feedback on teaching in a timely manner. Under the background of "Internet + Education", with the help of the convenience of Internet tools, teachers can timely find possible problems in teaching and effectively solve students' confusions when selecting course assistants. In order to promote teachers to improve the quality of teaching, students and teachers can conduct two-way video supervision to prevent students from distracting themselves in the form of videos; school administrators can develop a teaching evaluation system, and students can evaluate teachers based on the online teaching quality evaluation form. Online teaching activities are evaluated in an all-round way, and the evaluation is included in the teacher's personal assessment.

c. Guide students to interact and discuss.

In the process of online teaching, teachers can uniformly distribute course books and various learning materials (including electronic versions) to ensure that students can rely on the materials to carry out learning activities in the classroom. They can introduce learning software in the form of online courses or videos. Application, so that students are familiar with the use in advance, to ensure the normal progress of teaching activities. In view of the fact that students

cannot communicate and interact naturally like offline teaching, teachers can set up online learning groups (usually a group of 6-8 people) between students to play the role of online learning together. Teachers can organize students of different learning abilities in the class together according to their personality and learning situation to form a group with common goals, specialize or distribute the tasks of the group, and stimulate students' sense of collective and honor, In order to improve the efficiency of student learning. In addition, reasonable competition can be carried out between groups, and various forms of group activities can be organized, such as group results display, group score comparison, etc., to improve the learning competition atmosphere among students. At the same time, you can also carry out more discussion classes for online learning, taking the form of debates or replies, so that students can fully express their views and share and communicate with others, and enhance student interaction.

7. Inspection Tools

In order to more appropriately and accurately measure the quality of online teaching, by sorting out the problems in online teaching feedback from the questionnaire, and learning teaching quality evaluation literature and related materials, the research team designed an anonymous "Online Teaching Classroom in Colleges and Universities Quality Score Sheet" as shown in Table 1, which involves three dimensions of online teaching platform, instructors and students. In each dimension, different indicators are divided, and each indicator contains certain specific evaluation content and assigns different scores according to the degree of importance. Value weight. The students will evaluate the teaching quality according to the online teaching situation. The platform and teachers will improve the online teaching situation based on the problems and the above suggestions in the evaluation form, and then the students will evaluate the quality of the improved online teaching to check the online Improve teaching quality.

Table 1. Online Teaching Classroom in Colleges and Universities Quality Score Sheet

Online Teaching Classroom Quality Rating Scale (Anonymous Form & Hundred-mark System)					
Dimensionality	Indicators	Specific evaluation contents	Points weighting	Points	Subtotal
Online Teaching Platforms (30 points)	Accessibility (5points)	Platform is easy to operate	2 points		
		Unified teaching platform	3 points		
	Stability (5points)	Stable platform system operation	5 points		
	Functionality (20points)	Pre-lesson roll call; pre- and post-lesson clock-in function available	2 points		
		With classroom scoring function	2 points		
		Well-established operational systems are available	5 points		
		With teamwork system	5 points		
		There are platform teaching pages locked	3 points		
		There is two-way video supervision for students and teachers	3 points		
Teachers (40 points)	Teaching attitude (10points)	Teaching on time and not arriving late or leaving early	2 points		
		Praise students positively and criticize them moderately	3 points		

		Create opportunities to communicate with students and dialogue as equals	3 points		
		Prepare lessons carefully to fill points and design teaching objectives according to the actual situation of students	2 points		
	Teaching content (10points)	Focused lectures	2 points		
		Clearly structured lectures	2 points		
		Guiding students to think creatively	3 points		
		Guiding students to reflective thinking	3 points		
	Teaching methods (10points)	Reasonable classroom structure and time allocation	2 points		
		Appropriate use of multimedia tools and clear writing	2 points		
		Strict control of lecture time and guided independent learning	3 points		
		Provide timely feedback on student issues and answer questions	3 points		
	Teaching Management (10points)	Dealing effectively with classroom emergencies	3 points		
		Effective maintenance of order in the classroom	3 points		
		Monitor students' serious participation in classroom learning	4 points		
Students (30 points)	Learning Initiative (10points)	Attend class on time and do not leave early	3 points		
		Able to listen carefully to lectures	2 points		
		Able to actively complete teaching assignments after school	2 points		
		Pre-learning before class and revision after class can be completed	3 points		
	Learning interactivity (10points)	Good form of interaction	2 points		
		actively communicate, express and listen to each other and deal with conflicts and difficulties	2 points		
		Forming good cooperation between classmates	3 points		
		Well-established competition	3 points		
	Learning Effectiveness (10points)	Good concentration in learning	3 points		
		High level of information acceptance	3 points		
		Able to engage in exploratory learning	2 points		
		Good academic performance	2 points		
Total Points					

8. Conclusion

Today, under the normalization of the epidemic, online teaching has become an indispensable form of teaching, but the resulting teaching problems have also emerged one after another. Based on the student's perspective, this research explores possible problems in online teaching, designs online teaching quality evaluation indicators, and proposes suggestions for improving

platform functions and teacher teaching based on the evaluation results. By making better use of the leading role of teachers in online teaching and the supporting role of platforms in teaching, to help students mobilize learning enthusiasm, enhance teacher-student interaction, and effectively supervise students' learning status, etc., so that the quality of online teaching can be improved, and the form of online learning can be benign develop. As for this research, the practical application effect of the recommended test tool-"College Online Teaching Classroom Quality Rating Form" needs to be further correlated research.

It is foreseeable that with the continuous development of Internet technology, online teaching will have an increasingly important position in the education field. Although online teaching cannot completely replace the traditional "face-to-face" education model, the progress of online education will help make up for it. The shortcomings of offline teaching have formed a general trend of online and offline information integration, breaking the barriers of learning, promoting the integration of high-quality teaching resources and the optimization of teaching models, and cultivating more high-quality and comprehensive talents for the country.

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