Abstract: To investigate the pending problem and improve the effectiveness of online classrooms in the post-COVID-19 era, researchers conducted semi-structured interviews with 41 teachers from China, the Philippines, and other countries who have experienced long-time online classrooms. The research indicated that (1) all problems the teachers face in the online classroom can be classified into two types, including internal problems (the problems in teachers’ teaching, students’ learning, classroom discipline, and students’ psychology) and external problems (the problems in hardware and equipment, school management, education equity and privacy protection, and family interference). (2) To better improve online classroom effectiveness, teachers strongly call for a series of reforms, including the reform of school management, curriculum and teaching, after-class instruction, and psychological support, which require schools, teachers, and parents to work together to make fundamental improvements. (3) Educational equity issues caused by economic development level, long-term inefficient online interaction, and various internal contradictions are the fundamental reasons why the previous problems existing in the online classroom have not been solved. Teachers, schools, educational researchers, and government departments need to deeply study and analyze these reasons, which will help solve a series of past and present problems in the online classroom.

Keywords: online classroom, distance learning, education, teaching and learning

1 Introduction

1.1 Revisiting the Significance of Online Classroom

As a general term, the online classroom refers to the activities of teaching and learning mainly through the Internet (Zhao, 2021). Usually, some specific software based on Internet technology was adopted, such as Webex, Zoom, and Google Meetings. Since early 2020, especially since the outbreak of COVID-19 in a large area around the world, “online” has entered the most vigorous stage in history. Taking China, which is close to the average level of per capita GDP in the world, as an example, according to the Department of Higher Education, Ministry of Education of China (2020), as of May 8th, 2020, there were 1454 colleges and universities using online classrooms in China, and the number of participating students reached 17.75 million. The overall economic scale of China’s online education may reach 322 billion (WJS, e-Commerce Research Center, 2022), surpassing many popular industries including artificial intelligence, cloud computing, online diagnosis and treatment, and so on. These figures will be even larger worldwide. In the report of the China government in early 2022, the government continued to propose to further “develop online courses” (Zhongtai Securities, 2022).

Obviously, this phenomenon is inseparable from the following advantages of the online classroom: (1) online classrooms can save a lot of cost or time. Since there is no need to go to the classroom in a school, this convenience is becoming a pathway for learners with sparse access to physical courses so they can complete their degrees (Veletsianos, 2020), and online classroom learning is more efficient and less expensive, which allows students to save a lot of transportation, accommodation, and valuable time (Bijeesh, 2017), which give them more comfort and accessibility during COVID-19 (Mukhtar, Javed, Arooj, & Sethi, 2020). For those students in economically underdeveloped areas, the attraction is sufficient. Each semester usually saves a lot
of costs, which helps them to invest their limited funds in other places. (2) Online classrooms can solve many issues regarding education equity. As early as 2005, some researchers proposed that online classrooms could effectively provide vocational training and ability training for rural primary and secondary school teachers. There are few opportunities for rural primary and secondary school students to study outside of work for a long time, and online courses have solved this problem to a certain extent (Hassenburg, 2009). (3) Online classrooms make students' learning more flexible and personalized. Because online classroom allows students to be more flexible in their choices (Sadeghi, 2019). For example, they can learn without following a regular schedule of learning. Students can choose the course by themselves (Brown, 2017).

Judging from the epidemic situation in the past few years, the advantages of the online classroom are constantly being magnified. In fact, some of these advantages were already discovered before the epidemic. At the same time, it was further validated and confirmed after the epidemic, becoming evidence of the adoption of online classrooms. As the evaluation made by Dhawan (2020), the online classroom is a panacea in the time of the COVID-19 crisis. It has greatly changed the teaching of schools. Nowadays, quite a few schools have completely replaced face-to-face classes and mixed classes with online classrooms in some courses for three reasons: From the perspective of students, teachers, and other people, COVID-19 has changed our world, and people have been scared of coming out of their homes, which may cause virtual classrooms to be the future of schools and colleges (Alhat, 2020). From the perspective of the school or the administrator, the digitalization of education enables students to study during COVID-19 without interruption, which is good for both students and teachers (Jain & Lamba, 2021).

1.2 Worrisome Findings in COVID-19 Era

During the epidemic, due to the unprecedented widespread use of online classrooms, teachers, schools, and education departments have accumulated rich experiences that they did not have in the past. In this process, they also face various problems that they have not encountered in the past, and have gained more rich and unique understanding of online classrooms.

In university, the interaction effect of online classrooms in the past two years has been poor. “Close the camera and sleeping during class time,” “having class on a bed,” and “doing their things during class time” reflects the real learning situation of many university students in the online classroom (Chen & Long, 2020), which cannot be improved by teachers well.

In middle school, this issue cannot be ignored either. Yang, Yao, Qian, and Yan (2022) found through a survey that in some high school online classrooms, taking simple interactions such as answering questions as an example, only 49% of students occasionally have the opportunity to have such simple interactions with teachers, and only 23% of students often have such opportunities. And 28% of students have almost no opportunities for interaction.

In primary school, this issue is equally outstanding. The research by Ning and Gao (2020) found that 34.57% of primary students will have learning fatigue after 20 minutes of study, which is related to the fact that online teaching makes it impossible for primary school students to learn face to face with teachers in school. The survey also found an amazing fact that 4.36% of primary school students had a great decline in their academic performance, 81.42% had some declines, and only 5.37 & 0.73% had some improvements and great improvements.

In terms of specific reasons, some studies have conducted detailed analyses. Li (2020) found that in the “teacher-student interaction” of online teaching during the epidemic, with the weakening of teachers’ power, spatial distance reduces communication efficiency. A survey indicated that more than half of teachers agree the frequency and effect of interpersonal interaction in the online classroom are lower than those in the face-to-face classroom (Li, 2021).

Zhao, Yusof, and Hou (2022) indicated that in the Post-COVID-19 Era, it is necessary to further explore the problems in online classrooms from three aspects: interaction mode, teacher–student psychology, and technology. This is necessary to improve the interaction in online classrooms and ultimately improve the effectiveness of online teaching and learning at the current time because many studies on online classrooms are relatively old or during the pandemic as shown in this section; there were significant issues with timeliness, and new research needs to be carried out at the current stage.

In today’s post-pandemic era, re-studying online classroom issues can help us examine past practices and understand which strategies need improvement. This will provide more effective strategies and methods for future online learning and address the shortcomings of insufficient research timeliness before and during the epidemic. Considering the numerous studies mentioned earlier, in the post COVID-19 era, pure online classrooms are more valued than before the pandemic, making this study even more valuable.

To sum up, this study explored the problems and solutions that existed in online classrooms in the post-COVID-19
era and then analyzed the reasons why these problems had not been resolved by combining them with the research studies in pre-COVID-19:

(1) What are the problems faced by teachers in the online classroom in post-COVID-19 era?

(2) What suggestions do they think are very effective and can greatly improve the online classroom?

(3) What problems have not been solved for a long time? Why are these problems still unresolved?

2 Methodology

2.1 Data Collection

The qualitative research was based on grounded theory, adopting the form of a semi-structured interview to collect data, and the time of each interview was 25–30 minutes; 41 teachers from China (N = 4), the Philippines (N = 32), and others (they were in Asia but did not disclose their nationality, N = 5) were involved in this research. They all have more than 3 years of online teaching experience. The courses they teach include English and Chinese literature. Their students range from primary school to university, and they are of all ages. According to their own description, Chinese students account for a large proportion of students, while the rest come from various countries.

There are obvious cultural differences in their countries. China and the Philippines have their own complex cultural backgrounds. Due to the richness and complexity of the current content of this study, cultural factors are not considered in its analysis, which is one of the limitations of this study.

2.2 Data Analysis

NVivo-11 was the main tool for coding and analysis in this study. In this study, all data coding work was completed by one researcher, and thematic analysis was adopted. Coding refers to the process of labeling descriptive words or naming categories in the text (Miles & Huberman, 1994). In the process of implementation, the researchers followed the coding steps: (1) The researchers converted the content in the interview into text (transcription) and formed “nodes.” (2) The researchers categorized the nodes and formed the “sub-themes.” (3) Based on the categories researchers established final “themes” and formed the final understanding and analysis results of research questions (Table 1).

3 Results and Discussions

In this study, the researchers processed the data respectively for “problem” (problems) and “solution,” to form the results of RQ1 and RQ2 individually. At the same time, Question 3 (What problems have not been solved for a long time? Why are these problems still unresolved?) would be analyzed in DISCUSSION (Figure 1).

3.1 RQ1: What are the Problems Faced by Teachers in the Online Classroom in the Post-COVID-19 Era?

Researchers found that teachers are facing many problems in the post-COVID-19 era which usually come from both internal and external sources. These two themes are described respectively as follows:

3.1.1 Internal Problems

3.1.1.1 Teachers’ Teaching
Communication and interaction are encountered by most teachers in the online classroom. Nearly one-third of teachers in the research said it was difficult to maintain normal interaction and communication with students.

P-24-1-6: “Teaching in an online classroom is very difficult. The frequency of communication between me and my

### Table 1: Example of building Nodes, Sub-themes, and Themes

<table>
<thead>
<tr>
<th>Nodes</th>
<th>Number of Nodes</th>
<th>Sub-themes</th>
<th>Themes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Students are depressed and their mood is abnormal</td>
<td>7</td>
<td>Students’ psychological problems</td>
<td>Internal Problems</td>
</tr>
<tr>
<td>A sense of fear and strangeness in learning</td>
<td>5</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Incorrect assessment method</td>
<td>3</td>
<td>Teacher’s teaching</td>
<td></td>
</tr>
<tr>
<td>Very poor communication and interaction</td>
<td>17</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
students has greatly decreased because I can’t see my students physically.”

P-8-1-2: “Because you can't see students at all, many times your tentative communication can't be answered, and students are not willing to take the initiative to communicate with you.”

This problem was mentioned long before the epidemic; that is, teachers cannot interact well with students in online courses, just as what has been verified in many studies before the epidemic (Zhao & Yi, 2018). It is a long-term and urgent problem that needs to be solved. In fact, there is a lot of research on the decline of interaction in the online classroom, which has been discussed earlier (e.g., Blaine, 2019; Li, 2020, 2021; Rovai & Downey, 2010). This problem has a long history, but the development of the online classroom has not solved this problem well in the post-COVID-19 era.

The reason why the lack of good assessment is reported by some teachers is as same as that of the above phenomena – in the online class environment, teachers lack good methods of interaction with students, which leads to the failure of past assessment methods.

P-5-1-9: “The third problem is, the validity of their assessment.”

At the same time, the online assessment is unreasonable, and the results may be untrue. Some students believe that the online examination is less fair and cannot replace the traditional final examination (Yang, 2021). If the above problems are not effectively solved, it will affect each student's learning state and teachers' understanding of students.

In addition, inappropriate and insufficient learning content is also a problem worthy of vigilance. These two problems that the content of online courses is not rich have lasted for a very long time. Although these two questions were not mentioned when researchers asked teachers what problems they encountered in the online classroom, they were frequently mentioned when researchers asked teachers for advice. Therefore, it can be seen that these two problems also have a prominent impact. In fact, this problem has been pointed out by many studies, especially early studies. Bequiri, Chase, and Bishka (2009) found that the appropriateness of the online course would affect
student satisfaction, which deserved attention. In the early days, especially from 2000 to 2010, the Internet was just popularized in schools. Teachers usually introduced the content of traditional face-to-face courses directly into online teaching, which led to a mismatch between the curriculum and the content. The origin of this point is well known, but it is still not well solved. The school still orders the teachers to adopt unreasonable course contents instead of elaborately designed courses according to the characteristics of online.

3.1.1.2 Student’s Learning
In students’ learning, students’ attention is very difficult to be caught by teachers. This problem is very prominent in the online classroom, not only because the sense of distance makes it difficult for students to feel the supervision of others, thus distracting their attention, but also because the above-mentioned students have mastered the right not to let teachers see them, and they have taken the initiative. Lin and Chen (2012) found in the past that this phenomenon exists for a long time and can lead to a significant dependence on students’ initiative for learning in online classrooms. At the same time, their lack of identification and motivation is also one of the reasons for attention problems.

P-1-1-19: “Their attention has been difficult to focus on the classroom, and I have to use a lot of activities to attract their attention.”

P-10-1-3: “They can’t concentrate, especially when they turn off the camera, which happens widely.”

This verifies a significant problem reported by previous research: a moderate degree of attention loss in college students’ home online learning (Chen & Long, 2020).

P-1-3-3: “You know that many times student’s learning materials are lacking. If the school does not provide support, most of the time our teachers can only do slides. This is not a problem, but it is far enough for a class, for student’s learning. I mean, it’s not as rich as face-to-face classes.”

This paragraph is highly similar to the results of a previous study, indicating that more than 10 years have passed and this issue has not been resolved in any way. Jiang and Zhang (2011) found that most courses are based on a simple presentation of text teaching materials or teacher lecture notes, without setting up simulated real learning situations for learners, lacking practical problems that learners can solve, and unable to engage in group collaboration, role-playing, discussion, and questioning, problem-solving, etc.

In online classrooms, there are too few learning materials we can provide to students. Many times, it’s just slides and some recommended books that don’t provide them with more experiences, such as observation and visits. This also leads to confusion among many students during the learning process. For example, Huang (2013) found that this problem in classroom may cause students to lose direction and feel confused.

All these above have led to the decline of students’ learning quality, which is more serious in the countryside. The teachers described and confirmed this problem from many aspects.

P-10-1-2: “This will make their time for learning more less, I think. Yes, that is true.”

It is worth noting that the differences brought by regional and economic development, to some extent, affect the effect of the online classroom. A previous study by Xiao, Lin, and Chen (2020) shows that the quality of online teaching in rural areas, especially in economically underdeveloped areas, is significantly worse than that in urban areas.

Overall, students’ learning in online classes has been a long-standing issue, especially in the K12 stage of online classroom research. They mainly involve parents and teachers to analyze relevant issues from multiple perspectives. For example, Kuang (2019) found that from the perspectives of teachers and parents, students’ learning in online classrooms is inherently limited, with many drawbacks that software and technology cannot solve.

3.1.1.3 Classroom Discipline and Management
Students’ classroom discipline is also very prominent. Classroom discipline is the key to maintaining the normal operation of the classroom. If teachers can only see students, but cannot interact with them in a physical sense, this kind of classroom discipline is difficult to maintain. The field of view brought by the camera is limited, which means that there is a monitoring blind area. In this situation, online classrooms may lead to serious management issues, especially in the early days when network speeds were slower and device functionality was worse (Wang, 2005). Anyway, according to current research, although this issue has improved due to technological advancements, it still exists universally.

P-22-1-4: “In the online classroom or the online teaching, it’s very hard because I can only see them but there are no physical interactions with them.”

P-34-1-14: “Because you cannot see them. Most of them, maybe, are not listening but doing something else on the Internet, because we cannot see what they’re doing.”
Some teachers said that when they were giving a lecture, sometimes they could hear students typing with the keyboard. They didn’t distinguish whether they were chatting with friends or taking notes. This shows two situations: one is that the current classroom discipline is very poor, and the other is that it is difficult for teachers to take the initiative in controlling classroom discipline.

Yue and He conducted a detailed analysis of this issue in 2008, believing that classroom discipline can be divided into teacher-facilitated discipline, group-facilitated discipline, task-facilitated discipline, and student self-facilitated discipline. Due to the fact that online classes are conducted in an online environment, the factors that affect these probabilities are more complex, leading to many problems. It is precisely the weakening of these four aspects that have been influenced by online classrooms, which has brought great management pressure to teachers.

3.1.1.4 Students’ Psychology
Many teachers have the same problem in stimulating students’ learning motivation. Students’ learning motivation refers to those impetuses that can stimulate or maintain students’ learning behavior which needs a lot of ways to stimulate. Obviously, it is more difficult for teachers to do this in the online classroom.

P-2-1-27: “It’s difficult for me to stimulate their learning motivation because we don’t meet each other face to face.”

Attention and motivation are important parts of psychology. At the same time, there are also students’ psychological problems.

P-19-1-1: “Some are suffering from depression, and mental problem.”

In this study, the number of teachers who reported that students had various degrees of psychological problems is numerous, which is a problem worthy of great attention. According to the results of this study, this problem has not been well solved in the post-COVID-19 era.

From many previous studies, it can be seen that there are many factors that can affect students’ psychology in online classrooms, leading to a series of psychological problems (Sun, Zhao, Li, Chi, & Mu, 2015). Therefore, psychological issues have always been worth worrying about. From the interview, it appears that many teachers are not very satisfied with the psychological state of students in online classes and are full of concerns.

P-32-1-2: “I have always felt that students have different psychological problems. Some students are more withdrawn, possibly due to a long-term lack of communication, while others become strange, which is clearly not the case when they are in face-to-face classes or going out for activities. I find it easier for them to give up, I mean when faced with difficulties.”

This participant provided a very detailed description of this issue. In fact, this issue is very complex. In previous studies, Liu and Hu (2014) have found that the psychological state is closely related to other factors in many online courses, and in any case, it deserves further attention from schools and teachers.

3.1.2 External Problems

3.1.2.1 Hardware and Equipment
More than half of the teachers reported the Internet problem. Frequent disconnection or slow network speed would seriously interfere with the normal progress of teaching. And they thought this issue happened on “both sides.”

P-27-1-X: “Sometimes maybe the students or teachers also don’t have a good internet connection, which is a challenge.”

They believed that this problem required the intervention and solution of the government because this was a regional problem.

P-28-1-29: “There are issues or maybe some problems that I’m countering through my state.”

Many studies call for the establishment of a more stable and high-quality Internet during the epidemic because a stable network is the basis of all online classrooms, which is the most concerned problem of teachers and students (Ma, Wu, Zhou, & He, 2020). In fact, Wu and Turner (2006) found that network bandwidth speed has a significant impact on students’ interaction in online classrooms. When the network bandwidth is slow, student interaction will be greatly reduced. This ultimately had an impact on learning outcomes. Bandwidth issues or network issues have always been a topic of concern for teachers in online classrooms (Caris, Ferguson, & Gordon, 2002) and have not changed since 2002–2023.

The lack of teaching tools, environment, and equipment that are suitable for online courses is also a serious problem. It is worth noting that these problems are often closely related to Internet problems. Therefore, during coding, researchers chose to combine the views expressed by some teachers when they mentioned this problem.

P-25-1-69: “But in terms of the technical issue or the software that we use, yeah, that could be also a problem.”

P-32-1-19: “Our main problem is, the gadget that is the only thing we really need to help to improve the quality of online classroom teaching in my place.”
Many teachers still apply the teaching tools and equipment used in the face-to-face classroom, and the selection and design of the teaching environment are also casual. However, the unsatisfactory learning environment is the most prominent problem faced by college students’ E-learning (Hu & Liu, 2020).

3.1.2.2 School Management

The old and rigid management system is also shaky under the long-term online class, which shows the incorrect management of schools. The instability of teachers caused by various reasons has seriously impacted the quality of online classes. Some schools change teachers very frequently. Teachers and students are not familiar with each other, which damages the teaching effect to a certain extent.

P-36-1-X: “They often change teachers, every now and then there is always this introduction. I think, it is not advisable.”

Another important issue is a serious lack of teacher training. Many teachers have not received training at all, which leads them to neither understand students nor adopt teaching methods and contents suitable for an online class environment. Ray (2009) found that, although researchers tout the importance of training prior to teaching online, this study found that a large percentage of instructors are not receiving any training in pedagogy or technology prior to instructing their first online course. Researchers have been emphasizing this issue, but it has never been resolved.

P-30-1-35: “We have less training and don’t know how to deliver high-quality education in this situation.”

3.1.2.3 Education Equity and Privacy Protection

The lack of educational equity and privacy protection is the embodiment of the insufficient performance of school responsibilities. Some students do not have Internet or learning equipment because of family economic conditions or the backward regional economy, which makes them unable to obtain opportunities of online learning.

P-17-1-18: “We don’t have justice at this one, because we know that not all of the children have the capacity to attend this.”

This situation is also shown in the level of teachers’ skills. For example, urban teachers’ mastery of information technology is significantly higher than that of rural school teachers (Xiao et al, 2020). All these damage the equity of education.

At the same time, the ease of access and dissemination of video and text materials in online classes also greatly increases the risk of privacy disclosure. This is a problem that has not been mentioned in many previous studies. In fact, privacy issues deserve our attention, because they not only concern the personal safety of students and teachers but also affect the validity of the entire online classroom. A report by NPE on online learning in 2018 sparked high attention from the internet to this privacy issue. At present, it seems that there has not been a good solution, and over time, the attention has decreased, and the number of teachers who are aware of this problem is gradually decreasing.

P-33-1: “Most of the time we are not sure about our privacy.”

3.1.2.4 Family Interference

As mentioned above, parents replace peers and teachers and become the people who accompany students for the longest time. Therefore, the impact of parents’ incorrect behavior on students is gradually increasing.

P-36-1-19: “Parents should be with them, but they should not interfere.”

Some parents also have unsuitable expectations of the current education.

P-24-1-29: “Some parents expect too much from teachers and students.”

These reflect that the school does not communicate well with parents. According to previous studies, the negative impact of parents on students’ online learning is a widespread problem. During the epidemic, most university students feel that their parents cannot understand them, and it is difficult to communicate with their parents (Qi, 2020).

In fact, the concept of “family interference” is complex. Researchers find that it includes two situations: one is that the family members mentioned above should support students’ learning and behave properly for students’ learning, such as reasonable expectation and encouragement. The other means that family members should avoid making interference by doing some of their inadvertent behaviors when students are learning online. This was discussed in detail by Adedoyin and Soykan (2020), who discovered that the unexpected appearance or interruption of family members, friends, and pets may cause disruption or diversion of online learning participants’ attention during the online teaching and learning process.

3.2 RQ2: What Suggestions do they Think are Very Effective and Can Greatly Improve the Online Classroom?

After sorting, coding, analyzing, and classing, researchers found that teachers’ suggestions focused on four themes: reforming school management, improving curriculum and
teaching, adjusting after-class instruction, and offering psychological support.

### 3.2.1 Reforming School Management

First of all, schools should improve the management system and strengthen the training of teachers, especially to help teachers improve their teaching ability and curriculum design ability in the online class environment.

P-23-2-8: “Since I have been in this industry for 6 years now, I still need to do or to attend some training, because we know that education is evolving. But they rarely do that.”

At the same time, they should also strengthen the internal communication of teachers’ groups. The long-term epidemic has not only reduced the communication and interaction between students and teachers but also seriously negatively affected the communication and interaction among teachers. At the same time, schools should introduce counseling for teachers to avoid and solve the common psychological problems caused by the long-term epidemic. At the same time, school managers should organize abundant amateur activities for teachers to relieve pressure. Finally, it is very important to promote educational equity and offer learning opportunities for students in underdeveloped areas by providing financial funds, which can provide equipment and tools for these students.

### 3.2.2 Improving Curriculum and Teaching

#### 3.2.2.1 Teaching Preparation

In strengthening teachers’ lesson preparation, two parts need special attention: First, teachers and schools should update or adjust the current teaching materials. Many have not made special optimizations for the online class environment in the past 2 years.

P-28-23: “Most of the time I need some teaching materials. Because we don’t just focus on textbooks, of course. There are some certain materials that we also need to use in our teaching.”

Second, the teaching and learning environment should be specially designed. The atmosphere brought by this environment may greatly affect the learning state.

P-35-2-6: “You should teach in the classroom, the environment should be suitable and friendly for online.”

#### 3.2.2.2 Interaction in Teaching and Learning

Teachers should strengthen communication and interaction with students and pay attention to guiding students to share, which should be fully considered not only in classroom teaching but also in curriculum design and assessment.

P-19-2-8: “I think communication is very important. You can either talk to them privately or ask them some questions. You can also ask suggestions from them. So you can ask them what should I do in class that will make you motivated to learn.”

The mutual understanding brought by this communication can make all kinds of teaching and courses more successful in design and implementation. Problem-oriented teaching and learning have been proven to be very effective by some current participants. At the same time, giving enough feedback can greatly improve the teaching and learning effect in the current online classroom.

#### 3.2.2.3 Attention and Motivation

In classroom teaching, teachers should try to attract students’ attention through various ways, such as vivid teaching aids, real objects, vivid and interesting videos, and cards.

P-7-2-1: “Since the problem is about getting their attention, so you really need to take some effort, you know, to make the class livelier so that you will get their attention fully.”

Simple lectures or slide statements are more likely to make students bored in online classes than in face-to-face classrooms. Therefore, teachers should use a variety of methods to try to get students’ attention. At the same time, giving praise and avoiding punishment can effectively stimulate students’ learning motivation. That encouragement is an important behavior of teachers is mentioned directly or indirectly by almost all participants, which is of great value to students in the online classroom.

P-49-2-X: “I kind of need to encourage them or to motivate them, although sometimes their cameras are closed. But I still need to encourage them.”

#### 3.2.2.4 Student Assessment

In the online classroom, because students cannot be under the reasonable supervision and observation of teachers and schools, most of the traditional assessment methods may face the risk of failure. Therefore, the urgent task of schools and teachers is to explore and develop new assessment methods, which can help teachers understand the situation of students and adjust their teaching work.

P-8-2-X: “In online teaching, it is very important to assess, have a new way to assess.”

In addition to new assessment methods, the understanding of students is also very important, because students may also face various difficulties in e-learning, which
are the second factor that must be considered in the assessment.

3.2.2.5 Learning Content
The course content and teaching method should adapt to the network classroom. As mentioned earlier, many teachers and schools are still using the curriculum and teaching methods used in the past face-to-face classroom, which has caused some problems and must be changed. Thus, the learning difficulty should be appropriately adjusted. In the online class environment, students lack face-to-face guidance from teachers. If the learning difficulty is high, it is easy to badly weaken students’ learning motivation, resulting in weariness. According to Zhang (2014)’s research on students' writing learning, the higher the complexity and difficulty of learning tasks, the greater the pressure on students, and the greater the increase in self-confidence and motivation. For example, he found that when students could not find appropriate words to express their ideas, they would be tired of writing. Rich classroom activities, compared with boring knowledge, can alleviate the above problems.

P-9-2-19: “You have to know the students’ interests and have any some activities that are suitable for online. “

3.2.3 Adjusting After-Class Instruction
In the online class environment, students spend a lot of time alone, and teachers can’t contact them and interact with them well. In this case, students need to have a high degree of self-management awareness and ability. Therefore, it is very important to set up courses or experience-exchanging meetings to promote students to learn self-behavior management, goal management, and time management.

P-40-2-28: “If student has a good habit of self-management, they can manage themselves in the classroom and out of the classroom.”

At the same time, schools and teachers should promote students’ abilities in self-management and self-learning. Any kind of good study habits can hardly be formed by students alone, but through the joint efforts of students and teachers, especially the guidance of teachers.

3.2.4 Psychological support
Psychological support is divided into two parts. On one hand, schools should provide students with effective and humanized psychological counseling to solve and avoid students' unhealthy psychological state, which is conducive to their growth. On the other hand, schools should strengthen communication and education with parents, let parents play a correct and important role in the education of students, and avoid parents' improper behavior affecting students.

3.3 RQ3: What Problems Have Not been Solved for a Long Time? Why are these Problems Still Unresolved?

3.3.1 Analysis Combining the Results from Different Eras
Overall, the vast majority of issues existed in online classrooms prior to the pandemic and have been analyzed in detail by numerous past researchers. From the years of these studies in the past, it can be seen that, in addition to Family Interference, these studies already existed before the epidemic, have been widely and deeply discussed, and have also been verified and recognized to some extent by teachers and schools in practice. The researchers analyzed the following literature and found that the vast majority of problems have certain similarities with the problems currently faced. It is evident that these problems are serious and have not been resolved for a long time (Table 2).

3.3.2 The Reasons Why These Problems Still Unresolved
After detailed analysis, the researchers found that the main reasons why these problems have not been solved are in the following three aspects:

3.3.2.1 Economic Level and Educational Equity
China is still a developing country with a per capita GDP of only $12551 (Xiaoxiang Post, 2022), just above the world average. China’s overall economic level is not high and the development of various regions is uneven, which is reflected in the income of residents. Urban residents earned $7102 in 2021, whereas rural residents earned only $2835 in 2021 (Read Chuang, 2022), which was less than 40% of the former. This is a very striking difference, which means that there is a huge inequality in income between urban and rural areas, which also directly affects the balance of educational resources between the two different regions. A previous study by Xiao et al. (2020) showed that the quality of online teaching in rural areas, especially in economically underdeveloped areas, was significantly worse than that in urban areas. The economic level of the Philippines is lower than that of China, and their per capita GDP is about
one-third of that of China, facing similar problems. Regional differences in the Philippines have reached the same level. According to the city’s asset value in 2022 (China News, 2022), Quezon City, the richest city, was more than six times as rich as Manila, the third-tier city. The former is 415 billion pesos, while the latter is only 65 billion pesos. If ranked by provinces, the gap will be even larger. The total asset value of Cebu is 215 billion pesos, while Rizal is only 30.6 billion pesos. This reflects the economic imbalance between different regions, which also affects education to a certain extent.

The situations of China and the Philippines represent the higher and middle levels of developing countries in Asia respectively. Especially, they represent the plight of most countries in the Asia-Pacific region, particularly developing countries. While adequate economic support cannot be provided in education, there is an imbalance in educational development between regions, which greatly damages the issue of educational equity. This problem is particularly acute in rural areas and underdeveloped areas.

### 3.3.2.2 The Interaction Problem has Not been Resolved Well

At the beginning of this article, the researchers analyzed the deficiencies of online classroom interaction. According to Zhao et al. (2022), the severe problems in the interaction of the online classroom are poor effectiveness, low motivation, and many technical issues. These issues are derived from the essential characteristics of the online classroom itself teachers and students can’t face each other physically. As long as the online classroom is used, whether it is synchronous or asynchronous, whether it is one-to-one or one-to-many, this problem cannot be circumvented. As mentioned earlier, due to the focus on the entire education sector, the online classroom has received a lot of economic and policy support from 2020 to 2021, but the interaction problem has not been well solved in practice.

In various research, technology and teaching, which are two different research routes, are still the main solutions to improve the interaction of online classes. However, they have their own problems: (1) Technology — Although some developed areas have tried to introduce some new technologies to support online classroom teaching experimentally, they are all used in individual schools and short-term applications, or have not been used in a long-term or large-scale way; (2) Teaching — It appears that educators are fully aware of the elements that contributed to the decrease in teaching interaction effectiveness. But they also lack an effective strategy. For example, Zhao et al. (2022) found that students have the right to let teachers not see them, which means that the interaction between teachers and students has really changed. This is also the weakening of teachers' power, which will change the interaction in the online classroom (Li, 2020). In this case, it is difficult for teachers to dominate teaching, so the efficiency of teaching begins to decline. The solution to this issue may lie in reform and continued advancement of teaching methods.

### 3.3.2.3 Some Problems are Contradictory with Each Other

From the above results, we can find some problems are contradictory with each other: to solve one of them means that it will affect or aggravate the severity of the other, which makes it difficult to solve these problems alone.

For example, the privacy and interaction issues mentioned above. If you want to solve interaction, the best solution is to further introduce various new technologies. These new technologies ensure normal interaction by increasing the degree of teachers’ access to information.
and monitoring students. However, this means that privacy will be further undermined.

As we said above, this is a contradiction, which means that no matter what we do, we cannot improve interaction and protect students’ privacy at the same time. In fact, this problem is also true for teachers. The more students want to see teachers, the less privacy teachers have. The researchers find that this problem is a research gap, and there is no relevant research to explore and analyze it. If this problem can be effectively solved, researchers believe that it will help to improve the effect of the online classroom.

We find that because of the above three reasons, the problems in all the online classes mentioned above are difficult to solve, so they still exist after being put forward for a long time, and some problems even have a tendency to grow worse over time.

4 Conclusion

To solve these problems, it is important to start from three aspects: School, teachers, and parents. First of all, schools should improve their management, which can serve the work of teachers well. At the same time, schools establish a correct and efficient teaching management system to help teachers to deal with teaching problems. Secondly, teachers should improve the current state of online classrooms in three aspects: curriculum, teaching and learning, and assessment. Finally, schools and teachers should strengthen communication with parents and help parents correctly support students’ learning. In addition, it is very important to increase the research on online courses in the field of curriculum and teaching.

At the same time, the researchers believe that we should further explore how to solve the three issues mentioned in the DISCUSSION in the post-COVID-19 era: (1) We should explore how to promote educational equity by actively developing the economy and mitigating regional differences. This problem involves not only education, but also many departments outside of education; (2) we should think about whether we should further strengthen efforts to promote the solution of interactive problems by popularizing technology and improving teaching, or finding new methods, because it seems that the effect is not good at present. (3) The contradictions among these problems of network classrooms should also be given more attention. Sometimes when solving one problem, we should pay attention to whether it will have a negative impact on another problem. If this happens, we need to consider finding new solutions.

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