

# An Investigation of Obstacles of Current Online Classes Encountered by Students from an International Department of a Senior High School in Hangzhou during the 2019-nCov Period.

Yanbin Xu<sup>1,2\*</sup>, Zhekai Wu<sup>1</sup>

<sup>1</sup>Hangzhou NO.14 Middle school, Hangzhou, Zhejiang, China. First author.

<sup>2</sup> Hangzhou NO.14 Middle school, Hangzhou, Zhejiang, China. Second author.

\*Corresponding author. Email: bruceyuanbin@gmail.com

## ABSTRACT

Online courses are highly discussed recently. Covid-19 provided a great opportunity for students, teacher, and researchers to reconsider the application of online education in real-life setting. Unfortunately, because online courses were implemented as a response to the unexpected pandemic emergency, mature technological supports and adequate time to prepare were lacking: as a result, most online classes during Covid-19 pandemic only mimicked traditional classes without true innovation. In other words, online classes during the pandemic did not represent the full potential of online education. This research focuses on obstacles met by students and teachers during pandemic, while taking online course. Authors concluded some suggestions for online classes based on data collected from an International Department of a Senior High School in Hangzhou.

**Keywords:** *Online Education; Covid-19; Interactions of Online Classes; Survey Research*

## 1. Introduction:

### 1.1. Definition of online classes and Online education

How to define online classes and online education? Online education is a broad keyword, which represents the reformation in all aspects of the education field with the help of the Internet. Lichun Wang suggests that Online Education should include the reformation in educational management, teachers' teaching methods, curriculum, and students' learning methods (Wang). In this case, it has been becoming not only a remedial measure during the pandemic but also an inevitable revolution that take place in education because of the technology revolution (Qing). Unfortunately, because online courses were implemented as a response to the unexpected pandemic emergency, mature technological supports and adequate time to prepare were lacking: as a result, most online classes during Covid-19 pandemic only mimicked traditional classes without true innovation. In other words, online classes during the pandemic did not represent the full potential of online education.

### 1.2. Use of online classes in China

90.5 percent of students worldwide are impacted by school closures in August, according to UNESCO figures. The

same is true in China. Due to the massive population of Chinese students, China is one of the largest Internet education markets. Tencent classroom, for example, is one of the most popular and extensively-used online learning platforms for Chinese students during pandemic. The Chinese city of Wuhan, one of the areas worst affected by covid-19 has seen 81% of K-12 students attending online classes through the Tencent Online Class app. (Li).

### 1.3. Challenges:

Obstacles are still there to undermine the efficiency and safety of online classes due to the poor adaptability between teachers and students to their new roles in online classroom despite its widely access. In a survey from The Chinese University of Hong Kong (CUHK), 72 percent of students in Hongkong preferred face-to-face learning with only 23 percent of students satisfied with remote learning during pandemic outbreak. (Wong). Yutin Ma said that school teachers fail to explore new teaching models to fulfill the teaching goals. They seldom mix their teaching approaches with the cyber technology provided by platforms for students' improvement (Wong). Besides, students, especially those in primary school lack self-discipline in study without teachers' monitor and guidance when learning at home. In this case, quite a few students will be distracted by other interference during online classes as they are unaware of how to schedule in their study time.

To propose several ways for the improvement of online classes, a new survey of 80 students randomly picked in two grades from a school was conducted to reveal two main things: Interactions between teachers and students in the context of Internet education and obstacles faced by students during online classes.

Purpose statement: To propose several ways for the improvement of online classes.

## **2. Literature review**

### ***2.1. Interactions between teachers and students during online classes***

#### *2.1.1. The definition of interactions*

The understanding of interactions between teachers and students is an essential prerequisite for discussing the online situation. Wagner argued in the book *In support of a functional definition of interaction*, that “interactions are reciprocal events that require at least two objects and two actions. Interaction occurs when these objects and events mutually influence one another” (Wagner). Therefore, interaction is a process-oriented word to define the communication between the two subjects. In this respect, interaction is the most essential determinant for online classes. Scholars and professors, meanwhile, have indicated the importance of interaction between students or between teachers and students. Shale and Garrison declared that interaction is “education at its most fundamental form.”

#### *2.1.2. The situation of interaction in online classes.*

Recently, the shortage of the topic related researches or experiments makes empirical statistics hard to obtain. Besides, results that come out of field research about this topic always vary from student to student. According to the data from the Office of Assessment in Santa Clara University, 81 percent of students agree that “The course offered ample opportunities for interaction and communication from student to student,” and 82 percent of students believe that “The online course offered ample opportunities for interaction and communication from student to instructor” (Student Feedback). Nevertheless, several researchers take the opposite view that online classrooms are lack of interaction. Bude Su, a researcher involved in interviews on several teachers and students in an MBA program, said that the outcome reveals a lack of interactions caused by four aspects (Su). For students, some of them haven't got any enthusiasm for engagement in online communication and interaction. As to instructors, their lack of experience in online classes leads to the disability to put interactions into practice. Besides, there

are less communications among instructors makes it hard to get a holistic understanding of students' learning situation.

### ***2.3. Obstacles faced by students***

#### *2.3.1. Efficiency of online classes*

Firstly, the issue that whether online courses are more efficient than traditional offline classes are controversial. Some researchers argue that online classes are not so efficient as they seem. Jessica B. Heppen, who randomly assigned 1224 students to take either online or offline credit recovery courses, introduced that online classes are more challenging for students to understand and absorb the contents. Besides, he suggests that the effectivity of online courses is always lower than that of offline ones. June Ahn, a professor at New York University (NYU), said the students who learnt online fall behind their peers who learnt offline in the standardized tests. However, according to the statistics from the Office of Assessment in Santa Clara University, the students agree (37%) or strongly agree (48%) that online learning models helped them understand lessons. Moreover, the answer to the question “The time I spent online would have been better spent in a face-to-face class” shows a belief that online courses are better than offline classes: with 15 percent of students strongly agree with it and 16 percent of students agree with it. (Student Feedback).

#### *2.3.2. Economic and facilities support for online classes*

Secondly, granted, school closures are bad enough in some rich regions, while the harm they do in poor ones is much worse. There are still a great many students in poor areas less likely to have good Wi-fi, convenient electronic equipment, and ideal academic atmosphere. In a situation like this, they cannot get easy access to online classes and continue to study as their better-off peers. For example, The data from OECD in 2017 suggested while almost 95 percent of students in some developed countries, including Switzerland, Norway, and United Kingdom, have fast access to the internet at home, only 45.4% of students in Mexico can do so (OECD). In addition, the situation is severe as well in China where many parents cannot afford specific facilities for their children to learn online even though China creates the world's cheapest and the most effective smartphones with its faster growth of Internet than any other countries. According to official data from the Chinese government, only 59.6 percent of Chinese citizens can get access to the Internet. Surveys conducted by The Chinese University of Hong Kong (CUHK) reveals that 18.6 percent in 1168 Hongkong students need to borrow laptops to finish their online classes (Wong). In addition, according to the survey from The Society for

Community Organization (SoCo), more than 70 percent in 700 students surveyed, cannot quickly get access to the Internet (Wong).

**3. Research Questions:**

**3.1. What is the situation of interactions between teachers and students in online classes?**

**3.2. Do students meet any obstacle about the efficiency of online classes?**

**4. Current research methods:**

Questionnaire data was collected and analyzed. The authors collected data from Year 10 and Year 11 students in Hangzhou No.14 middle school AP center. To ensure the representativeness of samples, the authors used stratified sampling to pick up 80 samples from the population: 119 students in two grades. Year 1 students were selected as Strata 1, and Year 2 students were reinforced as Strata 2. In strata 1, the authors randomly picked up 40 students from 61 students. In strata 2, the authors randomly picked up 40 students from 58 students. In this case, 80 samples were selected by merging 40 students in both grades. Replication was reinforced here because there were enough experimental units to distinguish a difference in the effects of the treatments from chance variation. However, the number of valid questionnaires received were only 69: 37 from year ten and 32 from year 11.

In addition, to verify result distinctions caused by age differences, the data from year 10 and year 11 were collected separately. Grade 10 students took online courses mostly in their middle school, and most of the courses were to help them prepare for the senior high school entrance examination. Grades 11 students took online courses mostly when they are Grade 10 in high school. They had more electives than Grade 10 students. The survey used was written in Chinese, including three sections: the interactions between teachers and students in online classes, the basement for teachers to ask questions, and the efficiency of online classes. The first section designed for research question 1, and the last two sections prepared for research question 2. The Original survey was in the appendix. For each item, the results from both grades were compared. Similarity and differences would both be explained based on individual facts. To eliminate social expectation bias, researchers conducted the survey anonymously.

**5. Report findings:**

**1. Interactions between teachers and students in online classes**

**Overall interaction situations**

**a. Survey question: Compare with study in the school traditionally, interactions between students and teachers increase or decrease in online classes?**

- A. Increase
- B. Decrease

**a. Original Statistics**

**Grade 10**

Options	Number	Percentage
Increase	16	43.24%
Decrease	21	56.76%
Total	37	

**Grade 11**

Options	Number	Percentage
Increase	7	21.88%
Decrease	25	78.13%
Total	32	

**b. Summary**

For all the students from 2 grades, most of them believe that interactions between students and teachers decrease a lot: 66.7 percent of students choose “decrease.” However, the difference of number of students who choose different options in Grade 10 is smaller than it in Grade 11. In other words, there are more people believe that online classes include more interactions than offline classes in grade 10 than in grade 11.

**2. The percentage of students are able to interact with teachers**

**b. Survey question:**

How many students have chance to interact with teachers?

- A. Less than 10 percent
- B. Around 25 percent
- C. Around 50 percent
- D. Around 75 percent
- E. More than 90 percent

**c. Original data**

**Grade 10**

Options	Number	Percentage
Less than 10 percent	9	24.32%
Around 25 percent	12	32.43%
Around 50 percent	8	21.62%
Around 75 percent	8	21.62%
More than 90 percent	0	0%
<b>Total</b>	<b>37</b>	

**Grade 11**

Options	Number	Percentage
Less than 10 percent	13	40.63%
Around 25 percent	10	31.25%
Around 50 percent	7	21.88%
Around 75 percent	1	3.13%
More than 90 percent	1	3.13%
<b>Total</b>	<b>32</b>	

**d. Summary:**

Most of students in two grades believe that less than or around half of the students are able to interact with their teachers: 85.5 percent of students choose the first three

options. Within 59 students who choose first three options, 74 percent of students believe that less than or around 25 percent of students in a class are able to interact, and 37.3 percent choose the first option.

**3. Certain groups of students who participate a lot.**

**a. Survey questions:** Do you agree that there is a group of students, who always communicate actively with teachers during classes?

- A. Agree
- B. Disagree

**b. Original data**

**Grade 10**

Options	Number	Percentage
Agree	34	91.89%
Disagree	3	8.11%
<b>Total</b>	<b>37</b>	

**Grade 11**

Options	Number	Percentage
Agree	32	100%
Disagree	0	0%
<b>Total</b>	<b>32</b>	

**c. Summary:**

Almost all the students believe that there is a group of students, who always communicate actively with teachers during classes: 95.7 percent of all 69 students agree with the statement. Only 3 students in Grade 10 choose “Disagree options”.

**4. Unsuitable phenomenon about interactions**

**a. Survey questions**

Have you found the following phenomena in online classes?

- a. Some students pretend that they focus on the class and communicate with their teachers by using the word “oh” “yes” to pretend that they understand.

- b. Some students are too active in the class. They communicate with their teachers and their classmates about some topics unrelated to the classes.
- c. Both phenomena
- d. Neither

**b. Original Data:**

**Grade 10**

Options	Number	Percentage
A	2	5.41%
B	5	13.51%
Both	20	54.05%
Neither	10	27.03%
<b>Total</b>	<b>37</b>	

**Grade 11**

Options	Number	Percentage
A	2	6.25%
B	9	28.13%
Both	18	56.25%
Neither	3	9.38%

**c. Summary**

Most of students in both Grade believe that they have met these two phenomena in online classes: 54.05 percent in Grade 10 and 56.25 percent in Grade 11. In both grades, more people have met phenomenon of B option. In grade 10, 67 percent of students have met B phenomenon, while in Grade 11, 84 percent of students have met. There is a slight difference between these two number.

**5. Basement for teachers to ask questions**

- a. **Survey questions:** In online courses, do you think the questions raised by the teachers are based on teachers' teaching plans or the learning status of the students?

- A. Based on teaching plans

- B. Based on learning status
- C. Mostly based on teaching plans, some based on learning status
- D. Mostly based on learning status, some based on teaching plans.

**b. Original Data**

**Grade 10**

Options	Number	Percentage
Based on teaching plans	6	16.22%
Based on learning status	0	0%
Mostly based on teaching plans, some based on learning status	29	78.38%
Mostly based on learning status, some based on teaching plans.	2	5.41%
<b>Total</b>	<b>37</b>	

**Grade 11**

Options	Number	Percentage
Based on teaching plans	7	21.88%
Based on learning status	11	34.38%
Mostly based on teaching plans, some based on learning status	13	40.63%
Mostly based on learning status, some based on teaching plans.	1	3.13%
<b>Total</b>	<b>32</b>	

**c. Summary**

Most of students believe that the questions proposed by teachers are based on teaching plans or mostly based on teaching plans: 95 percent of students choose option A and C in Grade 10, and 61 percent of students choose option A or C in Grade 11. However, there is no people choose option B in Grade 10, but there is 34 percent of students choose option B in Grade 11. This is significant difference.

**A. Efficiency of online classes**

**1. Whether students have several obstacles of asking questions in online classes.**

**a. Survey questions**

Will you hesitate to ask questions because there are too many students in a class or most of the students are strangers for you?

- A. Yes, I will.
- B. No, I will not.

**b. Original Data**

**Grade 10**

Options	Number	Percentage
Yes, I will	14	37.84%
No, I will not	23	62.16%
Total	37	

**Grade 11**

Options	Number	Percentage
Yes, I will	9	28.13%
No, I will not	23	71.88%
Total	32	

**c. Summary**

Majority students believe that their questions asking will not be influenced by other students: 62.16 percent of students in Grade 10 choose option B, and 71.88 percent of students in Grade 11 choose option B. However, more people in Year 10 will be influenced by students around them: 37.84 percent choose option A in year 10, but 28.13 percent choose option B in year 11.

**2. Influences of other things unrelated to classes**

**a. Survey questions:**

Q1: Have you checked your cell phones or did anything

unrelated to classes in online classes?

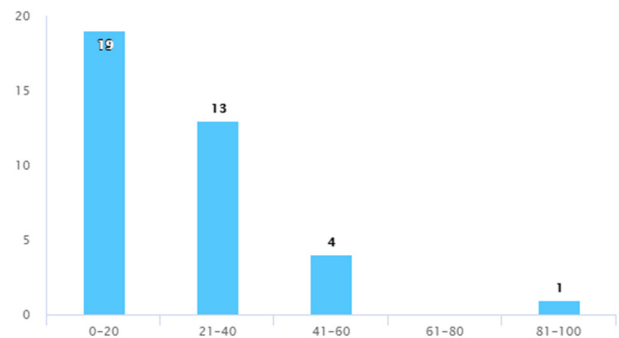
- A. Yes, I have.
- B. No, I have not.

Q2: On average, how long have you got distracted by these behaviors in a class? ( Use percentage of whole class time to show)

**b. Original Data**  
**Year 10 Q1**

Options	Number	Percentage
Yes, I have.	25	67.57%
No, I have not.	12	32.43%
Total	37	

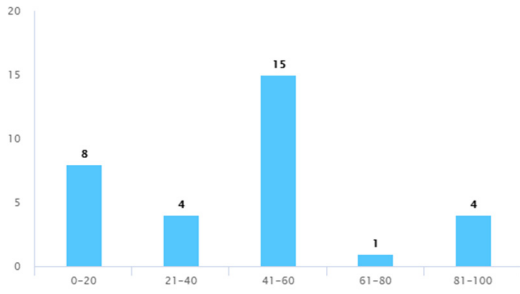
**Year 10 Q2 Average: 25.97**



**Year 11 Q1**

Options	Number	Percentage
Yes, I have.	27	84.38%
No, I have not.	5	15.63%
Total	32	

Year 11 Q2 Average: 44.44



**c. Summary**

Most of students have been distracted by their cellphones, or anything unrelated to classes in online classes: 67.57 percent of students choose option A in Year 10, and 84.38 percent of students choose option A in Year 11. In addition, in year 10, students would spend average 1/4 of class time on these distractions, while in year 11, students spent almost half of class time on these distractions. Year 11 students will be more likely to be distracted by these distractions than Year 10 students.

**3. Apply special function of online classes.**

**a. Survey questions:**

Do you think you make full use of the functions and traits of online classes, such as pulling progress bar, to meet your own personalized learning needs?

- A. Yes, I do.
- B. No. I don't

**b. Original Data**

Options	Number	Percentage
Yes, I do	27	72.97%
No. I don't	10	27.03%
Total	37	

Options	Number	Percentage
Yes, I do	10	31.25%
No. I don't	22	68.75%
Total	32	

**c. Summary:**

The answer is different between students in Year 10 and in Year 11. To be more specific, in year 10, most of students

believe that they have use the special functions for their own personalized learning. However, In year 11, most students believe that they have not use the functions well.

**6. Data analysis**

**Research Question 1:**

**What is the situation of interactions between teachers and students in online classes?**

In section "Interactions between teachers and students in online classes", overall number of interactions decreased dramatically when turned to online classes. More year 11 students believed that interactions have decreased than year 10 students. This was mainly because there was more workload during classes in year 11. Compare to offline classes in school, the daily number of classes shrank so teachers need to cover more content in a class.

In addition, most of students in both grades believe that less than half of the classmates had opportunity to get involved in the classes' discussions. Furthermore, almost all the students in both grades argued that a specific group of students always communicate actively with teachers during classes. When teaching online, teachers could not see students. In this case, they always got familiar with the students who interacted actively so they would always ask them questions and communicated with them so other students would not be able to get enough opportunity to interact with teachers.

For the question about some "unsuitable phenomena in online classes," 73 percent of year 10 students and 90.7 percent of year 11 students had seen both or single unsuitable behaviors in online classes. Students were not used to online classes, so novel classroom apps provided platforms for some students to fulfill their mental needs: people love to be focused.

For the question about "Basement of asking questions," majority of students believed that teacher asked questions based on teaching plans. This reinforced the idea that teachers did not renovate their ways of teaching when everything turned from offline to online.

**Research Question 2: Do students meet any obstacle about efficiency of online classes?**

In section "Efficiency of online classes," more than 50 percent of students in both grades will be distracted by other interferences including mobile phones. In addition, on average, students will spend a large part of class time on these interferences. In addition, year 11 students' self-control is much weaker than that of year 10 students. More students in year 11 will be interference and they spent much time on these interferences. This phenomenon is possibly because year 10 students need to take "Zhongkao", an extremely important senior high entrance exam in china, after online classes. However, year 11 students don't have

such pressure. In this case, year 10 students are forced to become more self-control and study more sinuously.

In section "Apply special function of online classes," similarly, year 10 students are more likely to use the functions, such as pulling progress bar, to fulfill their personal study demands. This can also be explained by their exam pressure.

## 7. Discussion

The analysis of data shows that Interactions of online classes were averagely less than in the offline classes. What's worse, most of teachers didn't have any innovation when the form of classes changed dramatically. In addition, students were also not familiar with online classes. Whether they would study efficiently online mostly based on their self-control. Some students would act unsuitably in classes, be influenced significantly by mobile phones, and be lack of interest on using some functions to improve their study actively.

Compared to a similar research about online MBA Courses conducted by Bude Su, similar conclusion can be made: online classes are lack of interactions because teachers don't have enough ability to handle teaching online, and teachers didn't make much renovation to change classes into a new form to become suitable for teaching online (Su).

Recently, many scholars have discussed the reliability of online classes theoretically. By contrast, seldom researchers focused on the application of online classes: what obstacles teachers and students will actually meet in the online classroom. This research conducted in the international department of Hangzhou No.14 middle school provides empirical conclusions about application of online classes in today's society. By using method of survey, authors focused a valuable and novel students' perspective.

## 8. Recommendation

Based on the results of surveys in this research, it might be worthwhile for the government and teachers to further develop efforts for students who take online classes.

Firstly, teachers should focus on more students. Some students did not discuss actively on their own initiative. In addition, some students are so shy that they always hesitate to ask questions when number of students in a class increases. In this case, these students will be ignored easily. Instead, teachers should give more opportunity to these students. Companies provide online classes services can also develop a function to count number of interactions of each student in classes. Therefore, teachers will be able to monitor the classes.

Secondly, teachers and parents should monitor study of students. Parents can prevent their children from being distracted by mobile phones or other interferences. Teachers

should monitor the result of homework and class discussion to interact with students based on how much knowledge students know. By monitoring, teachers and parents will significantly improve students' productivity.

More research is needed on efficiency of interactions between teachers and students outside of classroom. To be more specific, according to the definition of interaction, more behaviors outside the classroom can be defined as interactions such as homework drawbacks and office hour. Time of a single class is limited, but out of classroom, more opportunities are provided for students to communicate and interact with their teachers.

More research is needed on teachers' obstacles. Teachers are leaders of the classes so if they can get familiar with these new times of teaching, whole system will become more mature. In addition, teachers will consider online classes from different perspectives. In this case, they can provide other methods to improve the system.

## 9. Conclusion

In this paper, three authors collect, analyze, and apply first-hand statistics gathered from international department of Hangzhou No.14 middle school, Hangzhou, China, in conjunction with the literature review about other researchers' ideas and results to find out the students' obstacles and problems about interactions in online classes. Authors conduct this research from students' perspectives, which is novel among other similar researches in this field. According to the content of literature review, students who not only meet obstacles about study in online classes such as lack of interactions, but tremendous disparity of families' backgrounds between different students also influence students' learning. Some students had 2 or 3 devices to use for online education, but some even did not have Internet to support their study.

According to research data, students are lack of interactions in classes. In addition, teachers will ignore some students who didn't interact actively in classes because they are shy when they take classes with a great many unacquainted students. Also, some students have several unsuitable behaviors and some students attract teachers much; They affect other students' interactions. For obstacles of students, whether they can learn efficiently online mostly based on their self-control: controlling themselves not to use mobile phones when taking classes or controlling themselves to work hard.

## References

- [1] Wang, Chunli(2016). The discussion about development of Online education. *Journal of Qiyedaobao*, pp.62-63. DOI: 10.19364/j.enki.42-1616/f.2016.11.44. [kreader.cnki.net/Kreader/CatalogViewPage.aspx?dbCo](http://kreader.cnki.net/Kreader/CatalogViewPage.aspx?dbCo)



de=CJFQ&filename=QYDB201611044&tablename=CJFD2016&compose=&first=1&v=Mjc1MjkrUnRGaW5tVjd6UE5EVFBiTEc0SDImTnJvOUJZSVFJQlgxTnloQm02azRJVEftWHJoY3IGckNVUjdxZmI=.

[2] Qing, Nan. "International education: nature, problems, and structures." *Contemporary Education and Culture*, Vol. 8, No. 3, May 2016. Zhiwang, [kreader.cnki.net/Kreader/CatalogViewPage.aspx?dbCode=CJFQ&filename=GSJG201603005&tablename=CJFD2016&compose=&first=1&v=MDg3MjNOeWhCbTZrNEIUQW1YcmhjeUZyQ1VSN3FmYitSdEZpbm5XcnJQSWo3QmFiRzRIOWZNckk5RIlZUUCWDE=">Co vid-19 Impact on Education.](http://kreader.cnki.net/Kreader/CatalogViewPage.aspx?dbCode=CJFQ&filename=GSJG201603005&tablename=CJFD2016&compose=&first=1&v=MDg3MjNOeWhCbTZrNEIUQW1YcmhjeUZyQ1VSN3FmYitSdEZpbm5XcnJQSWo3QmFiRzRIOWZNckk5RIlZUUCWDE=) UNESCO, 1 Sept. 2020, [en.unesco.org/covid19/educationresponse](http://en.unesco.org/covid19/educationresponse).

[3] Goldsmith, Jill. "The Los Angeles Unified School District and PBS SoCal/KCET." *Deadline*, 13 Mar. 2020, [deadline.com/2020/03/pbs-socal-kcet-lausd-los-angeles-schools-close-1202883111/](http://deadline.com/2020/03/pbs-socal-kcet-lausd-los-angeles-schools-close-1202883111/). OECD (2020), *Access to computers from home (indicator)*. doi: 10.1787/a70b8a9f-en, 2 Sept. 2020, [data.oecd.org/ict/access-to-computers-from-home.htm](http://data.oecd.org/ict/access-to-computers-from-home.htm).

[4] Li, Cathy, and Farah Lalani. "The COVID-19 pandemic has changed education forever. This is how." *World Economic Forum*, 29 Apr. 2020, [www.weforum.org/agenda/2020/04/coronavirus-education-global-covid19-online-digital-learning/](http://www.weforum.org/agenda/2020/04/coronavirus-education-global-covid19-online-digital-learning/). "730,000 students choose Tencent class in 900,000 primary and secondary school students." *Tencent cloud*, 24 Feb. 2020, [cloud.tencent.com/developer/article/1589218](http://cloud.tencent.com/developer/article/1589218).

[5] Wong, Tsui-kai. "Survey says Hong Kong students didn't like online learning during Covid-19 class suspension." *Young post*, *South China Morning Post Publisher*, [www.scmp.com/yp/discover/news/hong-kong/article/3087209/survey-says-hong-kong-students-didnt-online-learning](http://www.scmp.com/yp/discover/news/hong-kong/article/3087209/survey-says-hong-kong-students-didnt-online-learning).

[6] Sorensen, Nicholas, et al. "The Struggle to Pass Algebra: Online vs. Face-to-Face Credit Recovery for At-Risk Urban Students, *Journal of Research on Educational Effectiveness*." *Journal of Research on Educational Effectiveness*, Vol.10, no.2, 26 Sep. 2016. Taylor and Francis Online, [journals.sagepub.com/doi/pdf/10.3102/0013189X17692999](http://journals.sagepub.com/doi/pdf/10.3102/0013189X17692999).

[7] "Student Feedback on Online Summer Courses." *Santa Clara University*, Oct. 2019, [www.scu.edu/media/information-services/academic-technology/Student-Online-Course-Summer-Survey-Report---October-2019.pdf](http://www.scu.edu/media/information-services/academic-technology/Student-Online-Course-Summer-Survey-Report---October-2019.pdf).

[8] Wagner, Ellen. "In support of a functional definition of interaction." *American Journal of Distance Education*, Vol. 8, No. 2, 24 Sep 2009. Taylor and Francis Online, [www.tandfonline.com/doi/abs/10.1080/08923649409526852?journalCode=hajd20](http://www.tandfonline.com/doi/abs/10.1080/08923649409526852?journalCode=hajd20).

[9] Su, Bude. "The Importance of Interaction in Web-Based Education: A Program-level Case Study of Online MBA Courses." *Journal of interactive online learning*, Vol.4, No.1. [www.ncolr.org/jiol/issues/pdf/4.1.1.pdf](http://www.ncolr.org/jiol/issues/pdf/4.1.1.pdf). "Statistical Report on Internet Development in China." *China Internet Network Information Center*, Feb. 2019,