Perceptions and Acceptance of Online Learning During the COVID-19 Pandemic: A Study Among Medical Students and Teachers

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Abstract

Background: The international recognition of the coronavirus pandemic (COVID-19) has prompted Chinese institutions to implement online learning. However, the actual responses of teachers and students to online education remain unknown.

Objective: to test the impact of pandemic on teachers and students mental health and learning ability.

Methods: : An online questionnaire survey was conducted, among medical students and teachers of Universities and colleges in Zhejiang. The questionnaires investigated the participants actual opinions on online learning and teaching

Results: A total of 1036 valid interviewees were involved in the present study, 478 males (46.1%) and 558 females (53.9%), including 155 teachers (15%) and 881 students (85%) (Chinese and international). The participants' age was divided into five categories 18 – 25 (62.2%), 26-30 (15.3%), 31-35 (12.7%), 36-40 (3.9%), and above 40 5.9%). The results reflected that teachers and students encouraged e-learning education during the pandemic as most of them could be adapted to the recent teaching style. They indicated that usage of electronic devices was very good (32.2%), and the internet connection during online classes was excellent, especially for Chinese students (32.5%). In addition, the majority of teachers and students responded to questions like “was the online communication easy and effective” was “yes” (54.20% teachers vs. 44.50% students), “what is the preferred method of communication during online learning” as “face-to-face communication (video call)” (43.90% teachers vs. 33.70% students), and “do you think learning or teaching the same as you were before the COVID-19 pandemic” as “somewhat” (49.70% teachers vs. 39.70% students). Furthermore, lockdown and quarantine were one of the concerns of the pandemic, especially for participants who traveled for their study (34.80% teachers vs. 25.20% students). On the other hand, there was a significant change in gender between Chinese and international interviewees as the Chinese females were more than international ones (58.9% Chinese vs. 45.7%) . In contrast, the international males were more than the Chinese ones (41.1% Chinese vs. 54.3% international). Additionally, international participants showed that the main struggle during the pandemic was the online classes (30.10% Chinese vs. 34.20% foreigners).

Conclusions: most instructors and students supported online education. Although teachers were less adaptive to online education, many still had favorable evaluations. The acceptability of online instruction was affected by sexual orientation.

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Abstract.

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Conclusions: most instructors and students supported online education. Although teachers were less

adaptive to online education, many still had favorable evaluations. The acceptability of online instruction was affected by sexual orientation.

Keywords: Covid-19 , Online learning , Medical students, Quarantine, School closures.

Background:

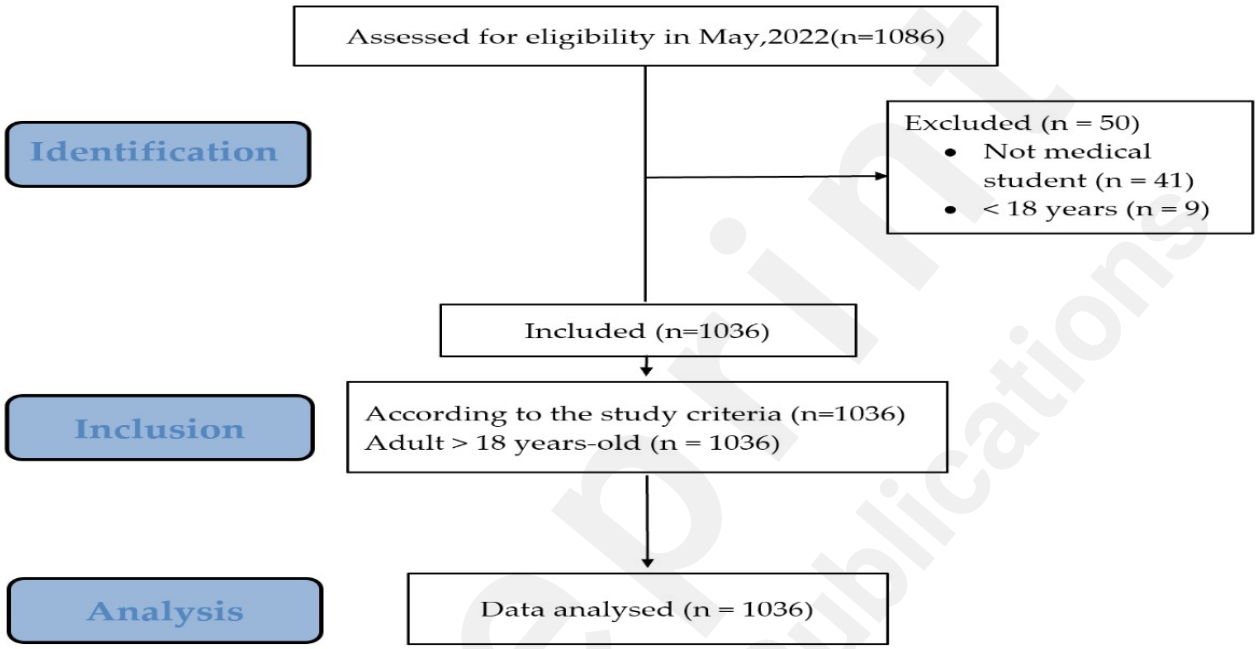
The Coronavirus pandemic (COVID-19) has posed complications for instructors and students. Globally, 100 countries have temporarily closed universities to prevent COVID-19 from spreading and extraordinary challenges for healthcare professionals(1-3). Approximately 68,000 international students are currently enrolled in medical and nursing programs in China, mostly from Asia and Africa (1). To manage the pandemic, the Chinese government has formulated restrictive legislations, such as prohibiting public meetings, schools closure, establishing social barriers between people, and isolating people at home . These measures were effective in reducing the number of new cases. Unfortunately, this reduction did not occur worldwide (4, 5). As a response to the pandemic, the Chinese education ministry established temporary guidelines for implementing online education in higher education institutions. In February, during the COVID-19 pandemic, online education became mandatory(1, 6). Due to the emergency, many international students enrolled in colleges are unable to return home. While institutions are abandoning campuses, a significant number of students have no adequate housing alternatives off-campus. Those who can return home are concerned that their schooling may be affected. Many students may lack the essential resources at home, including books, laptops, and high-speed Internet connections (7). About 80% of the global student population has been influenced by the schools and educational institutions closure (7, 8). Attempts to prevent the transmission of the COVID-19 virus among children and adults have resulted in the widespread suspension of universities, schools, colleges, and other educational organizations in several countries. Online classrooms are geographically unrestricted, allowing professors and students to complete assignments from home. Online education is an effective strategy for preventing infectious disease

spread in universities by breaking transmission pathways. In addition, numerous universities have already discontinued semester-end final examinations, but online classes will be continuous assessments. Therefore, Chinese colleges and universities have implemented online teaching approaches (7, 9). Online teaching significantly impacts student assessments (7, 10, 11). Network interactions can handle teaching conveniently and efficiently (9, 12). Moreover, students lacking an Internet connection will be at a substantial disadvantage throughout the assessment process, which will have a detrimental effect on their grade point averages (GPAs) (13, 14). Universities are increasing their efforts to safeguard students and faculty against highly contagious diseases. Recently, faculty members have been utilizing online teaching platforms (7). However, the actual emotions and attitudes of instructors and students remain unknown. Consequently, it is challenging for university administration to improve it and ensure its teaching effectiveness. In order to evaluate and understand the exact feeling of teachers and students and the success of online learning(9), the current research was conducted to test the learning and teaching abilities during online teaching and learning. Moreover, estimating the physiological conditions and the difficulties facing teachers and students through the online classes during the pandemic.

Methods:

An online survey was administered from February 20 to May 1, 2022. Self-designed questionnaires were distributed to medical students and teachers (Chinese and international)of Universities and colleges in Zhejiang the survey was done anonymously without identified information. In addition, all participants were at least 18 years old. The interviewees received the survey via their email and social media accounts and were requested to complete it as quickly as possible, with many reminders during the survey's validity period. The questionnaire comprised 27 questions. Age, gender, psychological state, perspectives on online teaching, satisfaction with online learning and teaching and teaching impacts, and obstacles of online learning and teaching, as well as an assessment of

teaching and learning, were all collected. The results from a questionnaire with a response time that was too short (<2 minutes) were omitted since it was believed that these questions were completed without consideration, rendering the data unreliable. Only one response per individual was permitted for the question-answer. All the data were imported into SPSS software version 28.0 for data analysis



using the chi-squared or exact test (Figure 1).

Figure1:STROBE flow chart. STROBE, Strengthening the Reporting of Observational Studies in Epidemology

Results

A total of 1036 persons carried out the current study, including about 27 descriptive items, such as age, gender, student or teacher, etc. **(Table 1).** The questionnaires were provided on an 18 – above 40

years old age scale. The highest number of the participants were 18 – 25 years old, about 644 (62.2%), whereas the 36 – 40 were about 40 (3.9%). Moreover, 478 males (46.1%) and 558 females (53.9%). These numbers included 155 teachers (15%) and 881 students (85%). At the same time, 334 participants (32.2%) believed that the electronic devices during the online teaching were good, and 14.3% evaluated that it was excellent. The internet performance during the online teaching scored about 32.5% for excellent performance, followed by 31.1%, 23.6%, and 12.8% for acceptable, good, and bad performance, respectively. Furthermore, the suspension of the study or work during the pandemic rating about 37.4% that there was no suspension, followed by 26.9% and 23% for some suspension reasons like a pandemic or because the applicant left China, respectively. On the other hand, online learning was extremely effective and useful with 33.3%. Online classes were one of the main struggles during the COVID-19 pandemic (31.7%) followed by traveling and quarantine, financial problems, depression, and anxiety (27.4%, 26.3%, and 14.7%) %), respectively. In addition, the results showed that 38.4% negatively affected their study and work, and about 26.5% affected their study or work and health. Accordingly, 56.9% have been anxious and depressed during the pandemic. Some participants' personal life and personality have been affected (54.6%), as well as some psychological problems (22.8%). The results revealed that the participants usually found to stay focused while the online courses were very difficult (30.1%), while 34.1% found that the online studying or teaching was slightly stressful. Additionally, there are some negative impacts of e-learning, including inappropriate student motivation (30.2%), poor attendance (20.8%), and other reasons (14.8%). Furthermore, an acceptable level of interaction during the e-learning classes has a moderate percentage of 29.7. On the other hand, doing online homework has a good performance (39.5%). In order to improve and enhance the online learning, introduce some attractive activities to enhance the student's understanding (31.3%), make videos shorter and more attractive (29%), record lectures to help the students to review (26.4%), and determine some specific instructions about the main points of the class and homework tasks (13.4%). Conversely, 54.1% of the participants

mentioned that online communication for students and teachers was not effective and easy. Although a few issues should be modified in e-learning and teaching, about 31.3% of participants revealed that it was enjoyable, while 28.1% said it was not enjoyable and had many difficulties. Regarding career life, 61% of the applicants showed that online learning would not be helpful in the improvement of their career **(Table 1).**

Table 1. Descriptive statistics for the study items

		N	%
Age	18-25	644	62.2
	26-30	159	15.3
	31-35	132	12.7
	36-40	40	3.9
	Above 40	61	5.9
Gender	Male	478	46.1
	Female	558	53.9
Student or teacher	Teacher	155	15.0
	Student	881	85.0
How do you rate using electronic devices while online teaching during the COVID-19 pandemic?	Poor	148	14.3
	Good	334	32.2
	Very good	231	22.3
	Excellent	323	31.2
What is your assessment of internet performance while online teaching during the COVID-19 pandemic?	Bad	133	12.8
	Acceptable	322	31.1
	Good	244	23.6

	Excellent	337	32.5
Did you suspend your study or work because of pandemic?	No, I did not suspend my study or work	387	37.4
	Yes, I suspended my study or work because of pandemic	279	26.9
	Yes, I suspended my study or work because I left China	238	23.0
	Yes, I suspended my study or work because of other reasons	132	12.7
Do you have difficulty using electronic devices during online learning?	No	662	63.9
	Yes	374	36.1
What is your evaluation of online learning?	Poor	113	10.9
	Below Average	163	15.7
	Average	235	22.7
	Good	231	22.3
	Excellent	294	28.4
Do you think online learning or teaching during a pandemic is effective and useful?	Not at all effective and useful	109	10.5
	Slightly effective and useful	172	16.6
	Moderately effective and useful	196	18.9
	Very effective and useful	214	20.7
	Extremely effective and useful	345	33.3
What is your main struggle during the pandemic?	Traveling and Quarantine	284	27.4
	Online Classes	328	31.7
	Financial Problems	272	26.3
	Depression and anxiety	152	14.7
How did covid-19 affect your study or teaching work and health status?	It has affected my study or teaching work and health	275	26.5
	It has affected my study or work	398	38.4

	It has affected my health	233	22.5
	It has not affected me at all	130	12.5
Are you agree with continue study online or teaching?	Not agree	213	20.6
	Acceptable	304	29.3
	Agree	223	21.5
	Strongly Agree	296	28.6
What was the concerns caused by the pandemic?	Lockdown and Quarantine	276	26.6
	Depression and anxiety	329	31.8
	Continue online Learning	240	23.2
	Teaching online Affecting student's future study	191	18.4
Have you been anxious and depressed during the pandemic?	No	446	43.1
	Yes	590	56.9
Had there been an impact on your personality and personal life during the pandemic?	No	470	45.4
	Yes	566	54.6
What do you think are the negative impact that affects students and teachers during the pandemic?	Poor attendance	215	20.8
	Inadequate student Motivation	355	34.3
	Online learning	313	30.2
	Another reasons	153	14.8
How do you evaluate interaction during e-learning?	Poor	269	26.0
	Acceptable	308	29.7
	Good	252	24.3
	Very good	109	10.5
	Excellent	98	9.5
What is your feedback for doing and correcting online homework?	Bad	261	25.2
	Good	409	39.5
	Very good	229	22.1
	Excellent	137	13.2

Did you face any problems during the pandemic?	Health problems	150	14.5
	Psychological Problems	236	22.8
	Physical or learning disability	212	20.5
	Difficulty distance education	134	12.9
	Difficulty learning or teaching online	160	15.4
	Other reasons	144	13.9
What do you think should be improving for online learning?	Record lectures which allow students to review	273	26.4
	Keep videos short and enjoyable	300	29.0
	Provide interactive activities which help students to understand	324	31.3
	Give specific instructions for main points and homework before class	139	13.4
Do you think online communication for student and teacher was easy and effective?	No	560	54.1
	Yes	476	45.9
Do you enjoy online learning and teaching?	Yes, surely	254	24.5
	Yes, although there are a few things I would like to modify	322	31.1
	No, there are a lot of difficulties	291	28.1
	No, not at all	169	16.3
Do you have difficulty with stay focused while explaining and learning during online learning?	I always find it difficult	221	21.3
	I usually find it difficult	312	30.1
	I sometimes find it difficult	276	26.6
	I rarely find it difficult	133	12.8
	I never find it difficult	94	9.1
Do you think the online learning and	No	632	61.0

teaching will be helpful to improve your career life?	Yes	404	39.0
What do you prefer method of communication during the online learning?	Face-to-face communication (video call	365	35.2
	Chat (written) communication	413	39.9
	Other	258	24.9
Are you learning or teaching same as you were before the COVID-19 Pandemic?	No	337	32.5
	Somewhat	427	41.2
	Yes	272	26.3
Do you feel stressed while online learning and teaching during the Covid-19 pandemic?	Not at all Stressful	181	17.5
	Slightly Stressful	353	34.1
	Moderately Stressful	250	24.1
	Very Stressful	127	12.3
	Extremely Stressful	125	12.1

Table 2. Comparison of characteristics of cases with learning ability

			Student or teacher		P-value
			Teacher	Student	
Age	18-25	N	97	547	<0.001
		%	62.6%	62.1%	
	26-35	N	23	268	
		%	14.8%	30.4%	
	More than 35	N	35	66	
		%	22.6%	7.5%	
Gender	Male	N	65	413	0.255
		%	41.9%	46.9%	
	Female	N	90	468	
		%	58.1%	53.1%	
	Poor	N	23	125	<0.001

		%	14.8%	14.2%	
Rate using electronic devices while online teaching during the COVID-19 pandemic	Good	N	74	260	
		%	47.7%	29.5%	
	Very good	N	38	193	
		%	24.5%	21.9%	
	Excellent	N	20	303	
		%	12.9%	34.4%	
Assessment of internet performance while online teaching during the COVID-19 pandemic	Bad	N	21	112	<0.001
		%	13.5%	12.7%	
	Acceptable	N	68	254	
		%	43.9%	28.8%	
	Good	N	45	199	
		%	29.0%	22.6%	
	Excellent	N	21	316	
		%	13.5%	35.9%	
Suspend study or work because of pandemic?	No, I didn't suspend my study or work	N	69	318	0.229
		%	44.5%	36.1%	
	Yes, I suspended my study or work because of pandemic	N	35	244	
		%	22.6%	27.7%	
	Yes, I suspended my study or work because I left China	N	34	204	
		%	21.9%	23.2%	
	Yes, I suspended my study or work because of other reasons	N	17	115	
		%	11.0%	13.1%	
Do you have difficulty using electronic devices during online learning?	No	N	106	556	0.207
		%	68.4%	63.1%	
	Yes	N	49	325	
		%	31.6%	36.9%	

Evaluation of online learning	Poor	N	21	92	<0.001
		%	13.5%	10.4%	
	Below Average	N	39	124	
		%	25.2%	14.1%	
	Average	N	44	191	
		%	28.4%	21.7%	
	Good	N	33	198	
		%	21.3%	22.5%	
	Excellent	N	18	276	
		%	11.6%	31.3%	
Do you think online learning or teaching during a pandemic is effective and useful	Not at all effective and useful	N	27	82	<0.001
		%	17.4%	9.3%	
	Slightly effective and useful	N	46	126	
		%	29.7%	14.3%	
	Moderately effective and useful	N	52	144	
		%	33.5%	16.3%	
	Very effective and useful	N	17	197	
		%	11.0%	22.4%	
	Extremely effective and useful	N	13	332	
		%	8.4%	37.7%	
Main struggle during the pandemic	Traveling and Quarantine	N	66	218	<0.001
		%	42.6%	24.7%	
	Online Classes	N	50	278	
		%	32.3%	31.6%	
	Financial Problems	N	26	246	
		%	16.8%	27.9%	
	Depression and anxiety	N	13	139	
		%	8.4%	15.8%	

How did covid-19 affect your study or teaching work and health status?	It has affected my study or teaching work and health	N	36	239	0.386
		%	23.2%	27.1%	
	It has affected my study or work	N	69	329	
		%	44.5%	37.3%	
	It has affected my health	N	31	202	
		%	20.0%	22.9%	
	It has not affected me at all	N	19	111	
		%	12.3%	12.6%	
Do you agree with continue study by online teaching?	Not agree	N	33	180	<0.001
		%	21.3%	20.4%	
	Acceptable	N	64	240	
		%	41.3%	27.2%	
	Agree	N	37	186	
		%	23.9%	21.1%	
	Strongly Agree	N	21	275	
		%	13.5%	31.2%	
What was the concerns caused by the pandemic?	Lockdown and Quarantine	N	54	222	0.013
		%	34.8%	25.2%	
	Depression and anxiety	N	36	293	
		%	23.2%	33.3%	
	Continue online Learning	N	31	209	
		%	20.0%	23.7%	
	Teaching online Affecting student's future study	N	34	157	
		%	21.9%	17.8%	
Have you been anxious and depressed during the pandemic?	No	N	77	369	0.071
		%	49.7%	41.9%	
	Yes	N	78	512	
		%	50.3%	58.1%	

Had there been an impact on your personality and personal life during the pandemic?	No	N	77	393	0.242
		%	49.7%	44.6%	
	Yes	N	78	488	
		%	50.3%	55.4%	
what do you think are the negative impact that affects students and teachers during the pandemic?	Poor attendance	N	39	176	0.499
		%	25.2%	20.0%	
	Inadequate student Motivation	N	48	307	
		%	31.0%	34.8%	
	Online learning	N	45	268	
		%	29.0%	30.4%	
	Another reasons	N	23	130	
		%	14.8%	14.8%	
How do you evaluate interaction during e-learning?	Poor	N	37	232	0.916
		%	23.9%	26.3%	
	Acceptable	N	50	258	
		%	32.3%	29.3%	
	Good	N	38	214	
		%	24.5%	24.3%	
	Very good	N	17	92	
		%	11.0%	10.4%	
	Excellent	N	13	85	
		%	8.4%	9.6%	
What is your feedback for doing and correcting online homework?	Bad	N	33	228	0.086
		%	21.3%	25.9%	
	Good	N	75	334	
		%	48.4%	37.9%	
	Very good	N	27	202	

		%	17.4%	22.9%	
	Excellent	N	20	117	
		%	12.9%	13.3%	
Did you face any problems during the pandemic?	Health problems	N	15	135	0.071
		%	9.7%	15.3%	
	Psychological Problems	N	32	204	
		%	20.6%	23.2%	
	Physical or learning disability	N	28	184	
		%	18.1%	20.9%	
	Difficulty distance education	N	30	104	
		%	19.4%	11.8%	
	Difficulty learning or teaching online	N	27	133	
		%	17.4%	15.1%	
	Other reasons	N	23	121	
		%	14.8%	13.7%	
What should be improving for online learning?	Record lectures which allow students to review	N	26	247	0.009
		%	16.8%	28.0%	
	Keep videos short and enjoyable	N	45	255	
		%	29.0%	28.9%	
	Provide interactive activities which help students to understand	N	63	261	
		%	40.6%	29.6%	
	Give specific instructions for main points and homework before class	N	21	118	
		%	13.5%	13.4%	
Was online communication easy and effective?	No	N	71	489	0.025
		%	45.8%	55.5%	
	Yes	N	84	392	
		%	54.2%	44.5%	

Do you enjoy online learning and teaching?	Yes, surely	N	44	210	0.666
		%	28.4%	23.8%	
	Yes, although there are a few things I would like to modify	N	46	276	
		%	29.7%	31.3%	
	No, there are a lot of difficulties	N	40	251	
		%	25.8%	28.5%	
	No, not at all	N	25	144	
		%	16.1%	16.3%	
Do you have difficulty with stay focused while explaining and learning during online learning?	A.I always find it difficult	N	30	191	0.549
		%	19.4%	21.7%	
	B.I usually find it difficult	N	50	262	
		%	32.3%	29.7%	
	C. I sometimes find it difficult	N	47	229	
		%	30.3%	26.0%	
	D.I rarely find it difficult	N	15	118	
		%	9.7%	13.4%	
	E.I never find it difficult	N	13	81	
		%	8.4%	9.2%	
Do you think the online learning and teaching will be helpful to improve your career life?	A. No	N	91	541	0.525
		%	58.7%	61.4%	
	B. Yes	N	64	340	
		%	41.3%	38.6%	
What prefer method of communication during the online learning?	Face-to-face communication (video call	N	68	297	0.048
		%	43.9%	33.7%	
	Chat (written) communication	N	55	358	
		%	35.5%	40.6%	
	Other	N	32	226	
		%	20.6%	25.7%	

Learning or teaching same as you were before the COVID-19 Pandemic?	No	N	48	289	0.037
		%	31.0%	32.8%	
	Somewhat	N	77	350	
		%	49.7%	39.7%	
	Yes	N	30	242	
		%	19.4%	27.5%	
Do you feel stressed while online learning and teaching during the Covid-19 pandemic?	Not at all Stressful	N	25	156	0.716
		%	16.1%	17.7%	
	Slightly Stressful	N	58	295	
		%	37.4%	33.5%	
	Moderately Stressful	N	40	210	
		%	25.8%	23.8%	
	Very Stressful	N	17	110	
		%	11.0%	12.5%	
	Extremely Stressful	N	15	110	
		%	9.7%	12.5%	

The comparison of teachers' and students' characteristics was made using chi-square. Age results showed a statistically significant difference as the percentage of those between the ages of 26 and 35 was higher in students (30.40%) than in teachers (14.80%) ($p < 0.001$) **(Table 2).** The rate of using electronic devices while online teaching during the COVID-19 pandemic showed a statistically significant difference as the percentage of good ratings was higher in teachers (47.70%) than students (29.50%) ($p < 0.001$). Moreover, the assessment of internet performance of the online teaching during the COVID-19 pandemic had significant difference ($p< 0.001$) as the percentage of excellent assessment in students was higher (35.90%) than in teachers (13.50%). The evaluation of online learning indicated significant difference as the percentage of excellent evaluation in students was

higher (31.30%) than in teachers (11.60%) (p< 0.001). In addition, about the online learning or teaching during a pandemic is effective and useful the results indicated that the percentage who thought it was extremely effective and useful in students, 37.70% was higher than in teachers (8.40%) with p-value< 0.001. The main struggle during the pandemic showed a statistically significant difference as the percentage of students who their main struggle during the pandemic was travelling and quarantine (42.60%) was higher than students who their main struggle during the pandemic was travelling and quarantine (24.70%) (p< 0.001). According to the question of agree with continue study by online teaching revealed that a significant difference with percentage of who thought it was acceptable to continue the study by online teaching was higher in teachers (41.3%) than in students (27.2%) (p< 0.001). Moreover, there was a significant difference (p< 0.001) due to the applicants who had depression and anxiety concerns caused by the pandemic was higher in students (33.3%) than in teachers (23.2%) as a result of what was the concerns caused by the pandemic. What should be improving for online learning showed a statistically significant difference as the percentage of record lectures that allow students to review was higher in students (28.0%) than in teachers (16.80%) with a p-value= 0.009. Furthermore, the online communication easy and effective showed a significant difference (p = 0.025) as the percentage of who said yes was higher in teachers (54.20%) than in students (44.50%). What is the preferred method of communication during online learning the results showed a statistically significant difference (p = 0.048) as the percentage of who said face-to-face communication (video call) was higher in teachers (43.90%) than in students (33.70%). Additionally, the question of would you prefer to get assignments and notices in papers or on internet-connected devices, regardless of device availability indicated a significant difference (p = 0.014) as the percentage of who preferred papers was higher in teachers (45.20%) than in students (34.80%),. The result of do you feel stressed while online learning and teaching during the Covid-19 pandemic revealed that there was a significant difference (p = 0.037) in the percentage of those who felt slightly stressed while online learning and teaching during the Covid-19

pandemic was higher in teachers (37.4%) than in students (33.5%) **(Table 2).** Figure 2 shows three age categories of participating teachers and students during the experimental period. The first age range was 18-26, including 62.60% teachers and 62.10% students. The second age range was 26-36, with the highest percentage of students (30.40%) and 14.80% of participating teachers. The last category of participants who are more than 36 years old showed that the percentage of teachers (22.60%) was greater than students (7.50%) (Figure 2).

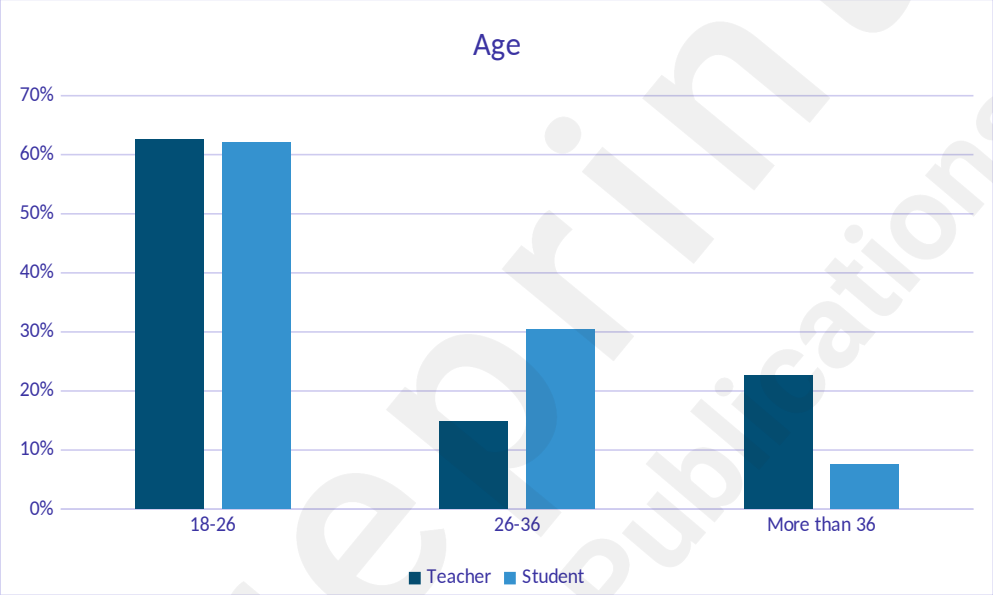


Figure 2. Bar chart for age across teachers and students

The results of the rate of using electronic devices during the online classes or teaching during the pandemic are presented in Figure 3. The data reflected a significant difference between the answers of teachers and students, as teachers represented 47.70% for good ratings and 29.50% for students. The students saw that it was more excellent (34.40%) than teachers (12.90%). While a non-significant difference between poor and very good answers (Figure 3).

The assessment of internet performance results showed remarkable changes with acceptable, excellent, and good choices between teachers (43.90%, 13.50%, and 29.0%) and students (28.80%, 35.90%, and 22.60%), respectively (Figure 4).

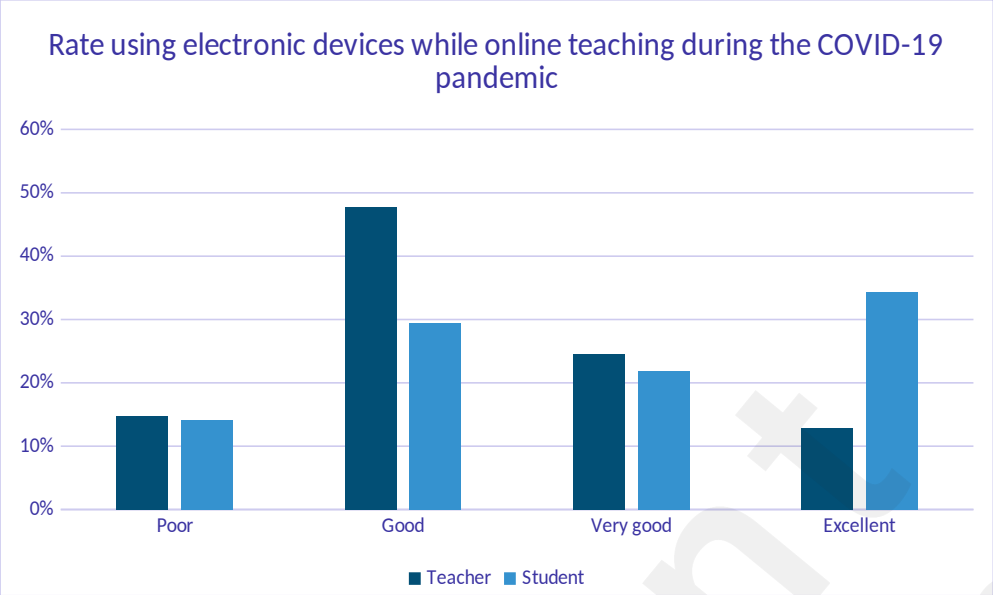


Figure 3. Bar chart for rate using electronic devices while online teaching during the COVID-19 pandemic across teachers and students

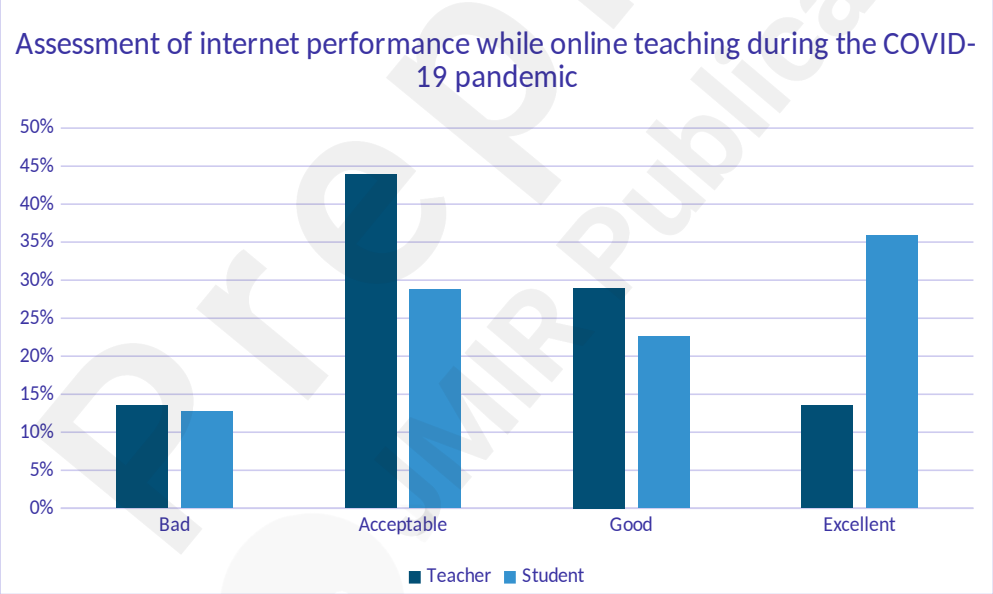


Figure 4. Bar chart for assessment of internet performance while online teaching during the COVID-19 pandemic across teachers and students

However, there were non-significant differences in the responses to the question “evaluation of online learning across teachers and students”, including “poor” (13.50% teachers vs. 10.40% students) and “good” (21.30% teachers vs. 21.30% students). Whereas, there were significant differences in the remaining responses “below average” (25.20% teachers vs. 14.10% students), “average” (28.40% teachers vs. 21.70% students), and “excellent” (11.60% teachers vs. 31.30%

students) as presented in Figure 5. There were significant differences in the responses of teachers and students on the question of "thinking the online learning or teaching during a pandemic is effective and useful as follows: "not at all effective and useful" (17.40% teachers vs. 9.30% students), "slightly effective and useful" (29.70% teachers vs. 14.30% students), "moderately effective and useful" (33.50% teachers vs. 16.30% students), "very effective and useful" (11.00% teachers vs. 22.40% students), and "extremely effective and useful" (8.40% teachers vs. 37.70% students) (Figure 6).

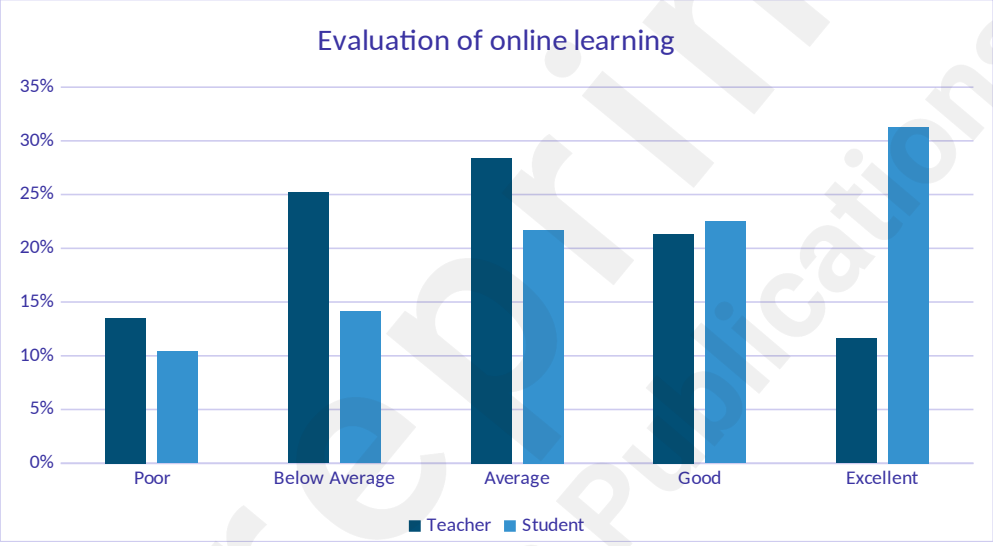


Figure 5. Bar chart for evaluation of online learning across teachers and students

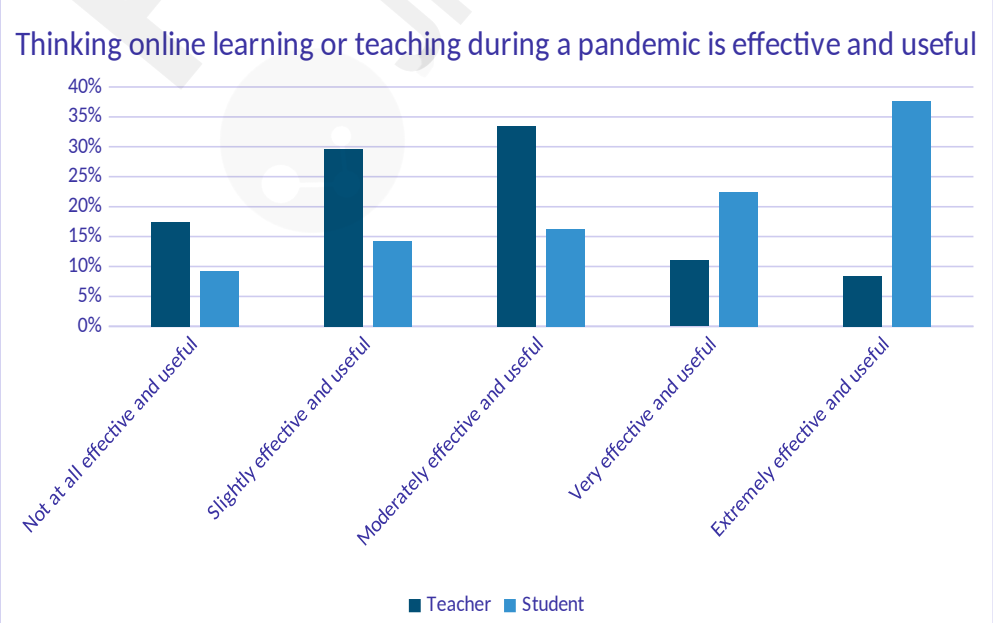


Figure 6. Bar chart for thinking online learning or teaching during a pandemic is effective and useful across teachers and students

Additionally, the question of “main struggle during a pandemic” has some significant difference responses, such as “travelling and quarantine” (42.60% teachers vs. 24.70% students) and “financial problems” (16.80% teachers vs. 27.90% students), besides some non-significant responses including “online classes” (32.30% teachers vs. 31.60% students), and “depression and anxiety” (8.40% teachers vs. 15.80% students) as showed in Figure 7. In Figure 8, the responses to the question “do you agree with the continuing study by online teaching” were as follows “not agree” (21.30% teachers vs. 20.40% students), “acceptable” (41.30% teachers vs. 27.70% students), “agree” (23.90% teachers vs. 21.10% students), and “strongly agree” (13.50% teachers vs. 31.20% students) (Figure 8).

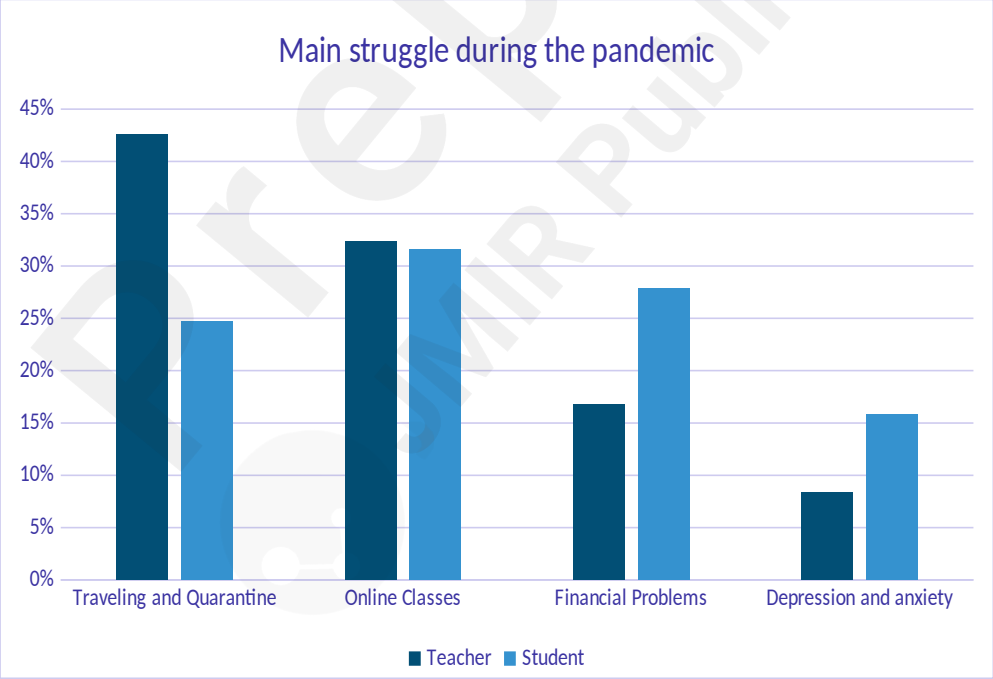


Figure 7. Bar chart for main struggle during the pandemic across teachers and students

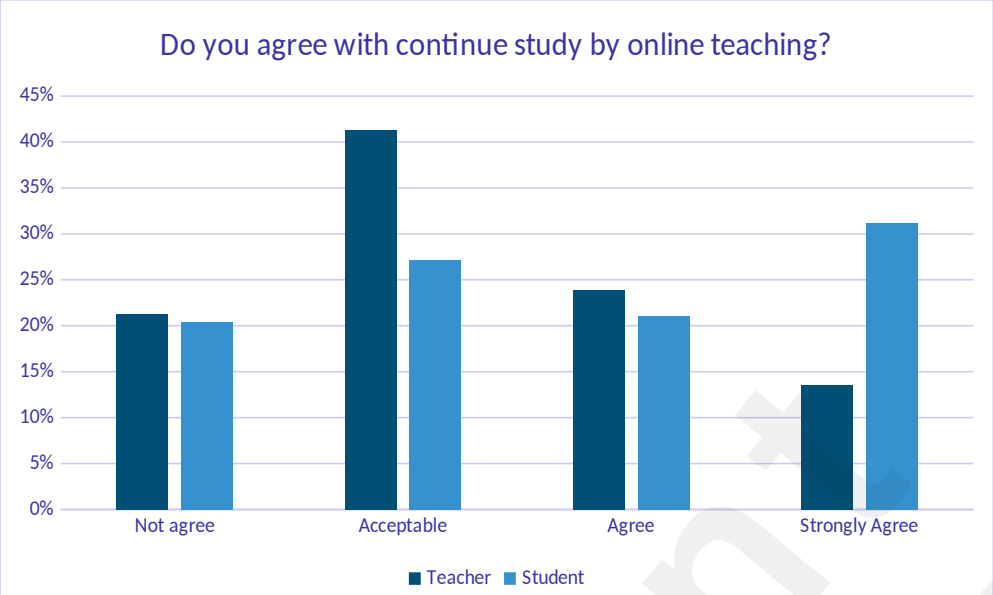


Figure 8. Bar chart for agreeing with continue study by online teaching across teachers and students

The responses for “what were the concerns by the pandemic” have statistically significant changes between teachers and students as “lockdown and quarantine” (34.80% teachers vs. 25.20% students), “depression and anxiety” (23.30% teachers vs. 33.30 students), “continue online learning” (20.00% teachers vs. 23.70% students), and “teaching online affecting student’s future study” (21.90% teachers vs. 17.80% students) (Figure 9). In addition, the question “what do you think should be improved for online learning” indicated non-significant differences in answers for “keep videos short and enjoyable” (29.00% teachers vs. 28.90% students) and “give specific instructions for main points and homework before classes” (13.50% teachers vs. 13.40% students) and some significant difference results “record lectures which allow students to review” (16.80% teachers vs. 28.00% students) and “provide interactive activities which help students to understand” (40.60% teachers vs. 29.60% students) (Figures 10).

Figure 11 reflects the results and responses to the question “was the online communication easy and effective” as disagreement “no” (45.80% teachers vs. 55.50% students) and agreement “yes” (54.20% teachers vs. 44.50% students). Moreover, the responses to the question “what is the preferred method of communication during the online learning” were as follows “face-to-face

communication (video call)" (43.90% teachers vs. 33.70% students), "chat (written) communication" (35.50% teachers vs. 40.60% students), and "other" (20.60% teachers vs. 25.70% students) (Figure 12). Do you think learning or teaching the same as you were before the COVID-19 pandemic showed responses as follows "no" (31.00% teachers vs. 32.80% students), "somewhat" (49.70% teachers vs. 39.70% students), and "yes" (19.40% teachers vs. 27.50% students) (Figure 13).

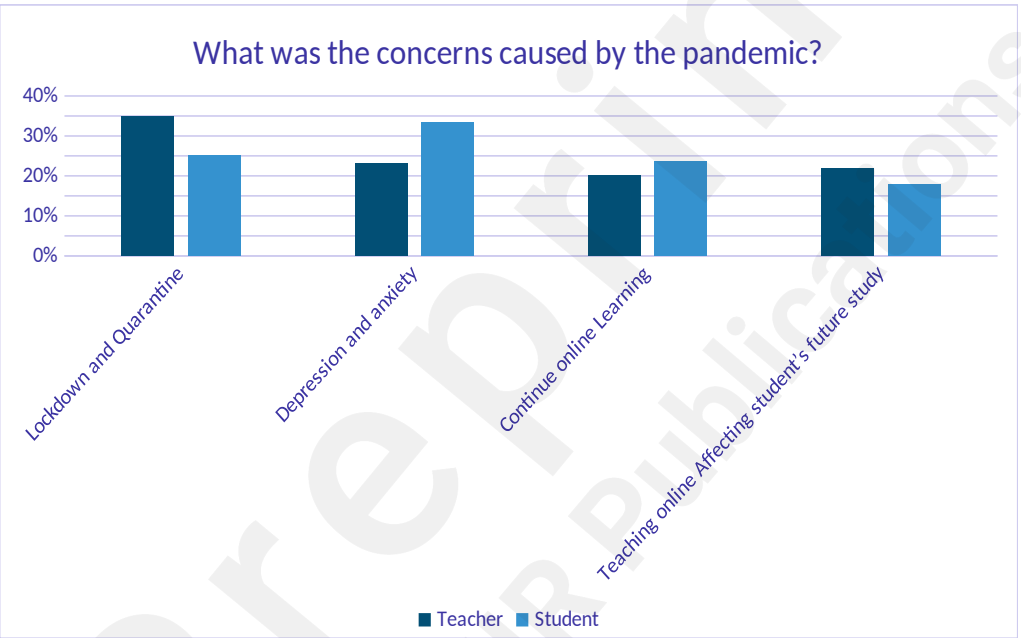


Figure 9. Bar chart for what was the concerns caused by the pandemic across teachers and students

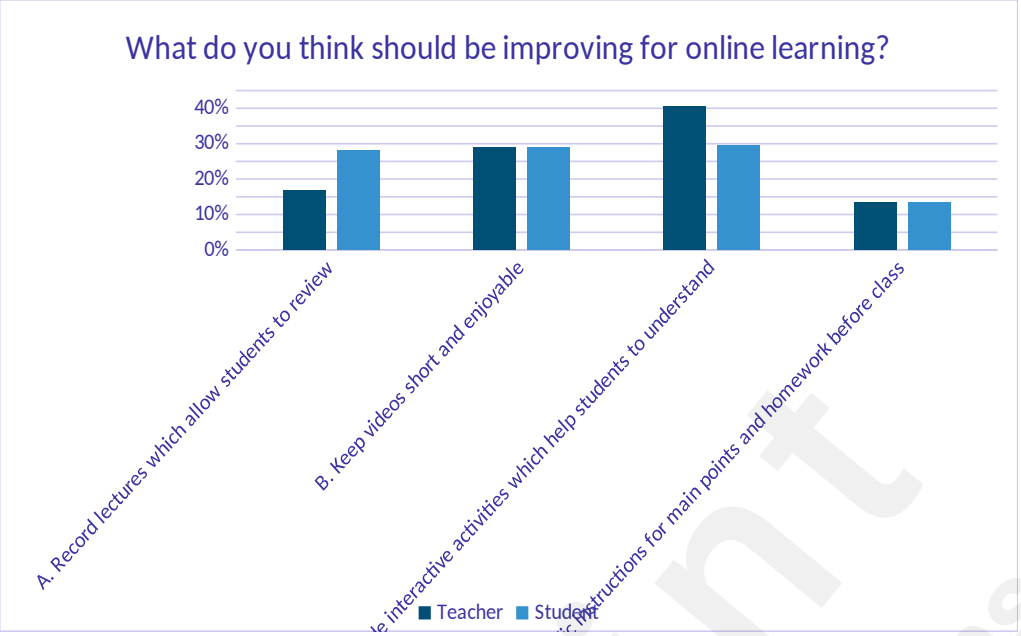


Figure 10. Bar chart for what do you think should be improving for online learning across teachers and students

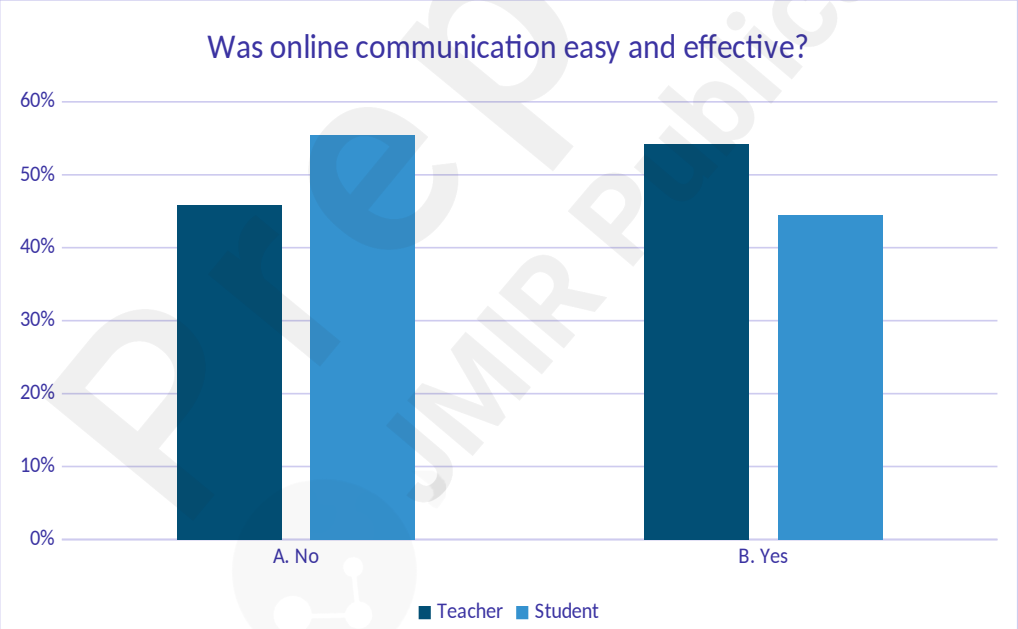


Figure 11. Bar chart for was online communication easy and effective across teachers and students

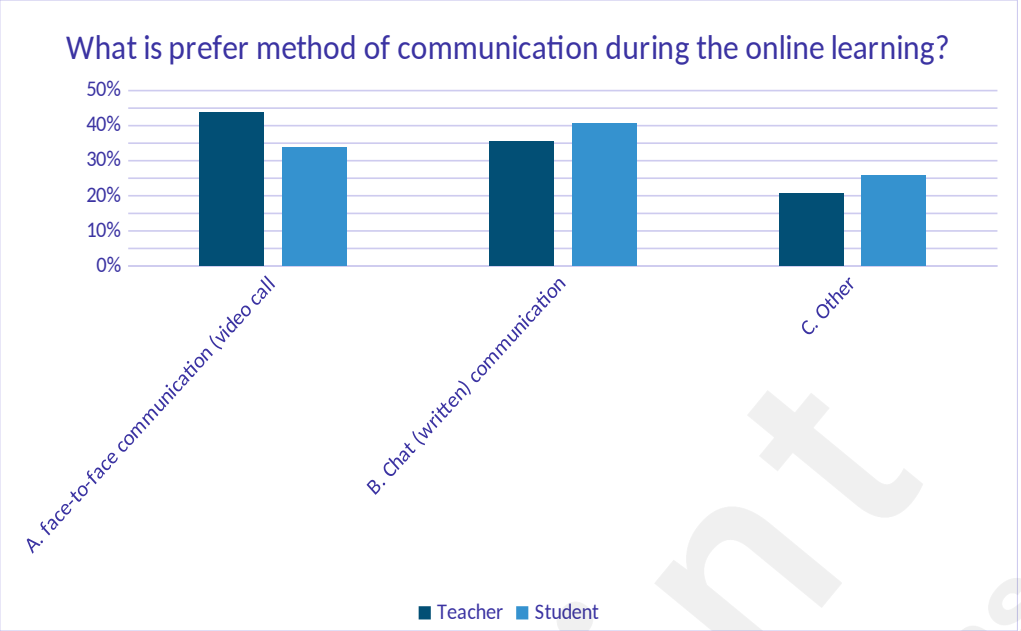


Figure 12. Bar chart for what is prefer method of communication during the online learning across teachers and students

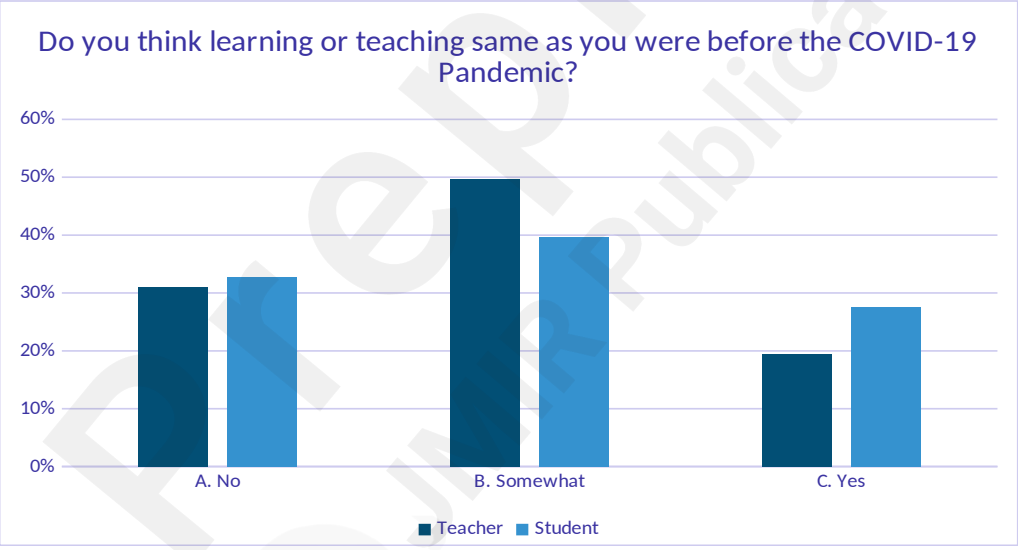


Figure 13. Bar chart for do you think learning or teaching same as you were before the COVID-19 Pandemic across teachers and students

Table 3. Comparison of Chinese and foreign participants:

			Nationality		P-value
			Chinese	Foreign	
Age	18-25	N	305	339	<0.001

		%	47.8%	85.2%	
	26-35	N	249	42	
		%	39.0%	10.6%	
	More than 35	N	84	17	
		%	13.2%	4.3%	
Gender	Male	N	262	216	<0.001
		%	41.1%	54.3%	
	Female	N	376	182	
		%	58.9%	45.7%	
Student or teacher	Teacher	N	145	10	<0.001
		%	22.7%	2.5%	
	Student	N	493	388	
		%	77.3%	97.5%	
How do you rate using electronic devices while online teaching during the COVID-19 pandemic?	A. Poor	N	82	66	0.067
		%	12.9%	16.6%	
	B. Good	N	215	119	
		%	33.7%	29.9%	
	C. Very good	N	153	78	
		%	24.0%	19.6%	
	D. Excellent	N	188	135	
		%	29.5%	33.9%	
Assessment of internet performance while online teaching during the COVID-19 pandemic	A. Bad	N	65	68	0.014
		%	10.2%	17.1%	
	B. Acceptable	N	203	119	
		%	31.8%	29.9%	
	C. Good	N	158	86	
		%	24.8%	21.6%	
	D. Excellent	N	212	125	

		%	33.2%	31.4%	
Did you suspend your study or work because of pandemic?	A. No, I didn't suspend my study or work	N	230	157	0.286
		%	36.1%	39.4%	
	B. Yes, I suspended my study or work because of pandemic	N	185	94	
		%	29.0%	23.6%	
	C. Yes, I suspended my study or work because I left China	N	145	93	
		%	22.7%	23.4%	
	D. Yes, I suspended my study or work because of other reasons	N	78	54	
		%	12.2%	13.6%	
Do you have difficulty using electronic devices during online learning?	A. No	N	414	248	0.401
		%	64.9%	62.3%	
	B. Yes	N	224	150	
		%	35.1%	37.7%	
What is the evaluation of online learning?	A. Poor	N	61	52	0.539
		%	9.6%	13.1%	
	B. Below Average	N	102	61	
		%	16.0%	15.3%	
	C. Average	N	147	88	
		%	23.0%	22.1%	
	D. Good	N	145	86	
		%	22.7%	21.6%	
	E. Excellent	N	183	111	
		%	28.7%	27.9%	
Do you think online learning or teaching during a pandemic is effective and useful?	A. Not at all effective and useful	N	57	52	0.025
		%	8.9%	13.1%	
	B. Slightly effective	N	105	67	
		%	16.5%	16.8%	

	and useful				
	C. Moderately effective and useful	N	138	58	
		%	21.6%	14.6%	
	D. Very effective and useful	N	126	88	
		%	19.7%	22.1%	
	E. Extremely effective and useful	N	212	133	
		%	33.2%	33.4%	
What is main struggle during the pandemic?	A. Traveling and Quarantine	N	195	89	0.024
		%	30.6%	22.4%	
	B. Online Classes	N	192	136	
		%	30.1%	34.2%	
	C. Financial Problems	N	166	106	
		%	26.0%	26.6%	
	D. Depression and anxiety	N	85	67	
		%	13.3%	16.8%	
How did covid-19 affect your study or teaching work and health status?	A. It has affected my study or teaching work and health	N	162	113	0.734
		%	25.4%	28.4%	
	B. It has affected my study or work	N	249	149	
		%	39.0%	37.4%	
	C. It has affected my health	N	144	89	
		%	22.6%	22.4%	
	D. It has not affected me at all	N	83	47	
		%	13.0%	11.8%	
Are you agree with continue study by online teaching?	A. Not agree	N	98	115	<0.001
		%	15.4%	28.9%	
	B. Acceptable	N	214	90	
		%	33.5%	22.6%	
	C. Agree	N	143	80	

		%	22.4%	20.1%	
	D. Strongly Agree	N	183	113	
		%	28.7%	28.4%	
What were the concerns caused by the pandemic?	A. Lockdown and Quarantine	N	182	94	0.116
		%	28.5%	23.6%	
	B. Depression and anxiety	N	208	121	
		%	32.6%	30.4%	
	C. Continue online Learning	N	141	99	
		%	22.1%	24.9%	
	D. Teaching online Affecting student's future study	N	107	84	
		%	16.8%	21.1%	
Have you been anxious and depressed during the pandemic?	A. No	N	279	167	0.576
		%	43.7%	42.0%	
	B. Yes	N	359	231	
		%	56.3%	58.0%	
Had there been an impact on your personality and personal life during the pandemic?	A. No	N	312	158	0.004
		%	48.9%	39.7%	
	B. Yes	N	326	240	
		%	51.1%	60.3%	
What do you think are the negative impact that affects students and teachers during the pandemic?	A. Poor attendance	N	138	77	0.545
		%	21.6%	19.3%	
	B. Inadequate student Motivation	N	220	135	
		%	34.5%	33.9%	
	C. Online learning	N	183	130	
		%	28.7%	32.7%	
	D. Another reasons	N	97	56	
		%	15.2%	14.1%	
How do you evaluate	A. Poor	N	147	122	0.064

		%	23.0%	30.7%	
interaction during e-learning?	B. Acceptable	N	200	108	
		%	31.3%	27.1%	
	C. Good	N	156	96	
		%	24.5%	24.1%	
	D. Very good	N	68	41	
		%	10.7%	10.3%	
	E. Excellent	N	67	31	
		%	10.5%	7.8%	
What is your feedback for doing and correcting online homework?	A. Bad	N	145	116	0.125
		%	22.7%	29.1%	
	B. Good	N	262	147	
		%	41.1%	36.9%	
	C. Very good	N	142	87	
		%	22.3%	21.9%	
	D. Excellent	N	89	48	
		%	13.9%	12.1%	
Did you face any problems during the pandemic?	A. Health problems	N	89	61	0.138
		%	13.9%	15.3%	
	B. Psychological Problems	N	139	97	
		%	21.8%	24.4%	
	C. Physical or learning disability	N	148	64	
		%	23.2%	16.1%	
	D. Difficulty distance education	N	78	56	
		%	12.2%	14.1%	
	E. Difficulty learning or teaching online	N	94	66	
		%	14.7%	16.6%	
	F. Other reasons	N	90	54	

		%	14.1%	13.6%	
What do you think should be improving for online learning?	A. Record lectures which allow students to review	N	163	110	0.621
		%	25.5%	27.6%	
	B. Keep videos short and enjoyable	N	194	106	
		%	30.4%	26.6%	
	C. Provide interactive activities which help students to understand	N	197	127	
		%	30.9%	31.9%	
	D. Give specific instructions for main points and homework before class	N	84	55	
		%	13.2%	13.8%	
Do you think online communication was easy and effective?	A. No	N	306	254	<0.001
		%	48.0%	63.8%	
	B. Yes	N	332	144	
		%	52.0%	36.2%	
Do you enjoy online learning and teaching?	A. Yes, surely	N	167	87	0.029
		%	26.2%	21.9%	
	B. Yes, although there are a few things I would like to modify	N	211	111	
		%	33.1%	27.9%	
	C. No, there are a lot of difficulties	N	166	125	
		%	26.0%	31.4%	
	D. No, not at all	N	94	75	
		%	14.7%	18.8%	
Do you have difficulty with stay focused while explaining and learning during online learning?	A.I always find it difficult	N	126	95	0.038
		%	19.7%	23.9%	
	B.I usually find it difficult	N	187	125	
		%	29.3%	31.4%	
	C. I sometimes find it	N	190	86	

	difficult	%	29.8%	21.6%	
	D.I rarely find it difficult	N	75	58	
		%	11.8%	14.6%	
	E.I never find it difficult	N	60	34	
		%	9.4%	8.5%	
Do you think the online learning and teaching will be helpful to improve your career life?	A. No	N	374	258	0.046
		%	58.6%	64.8%	
	B. Yes	N	264	140	
		%	41.4%	35.2%	
What do you prefer method of communication during the online learning?	A. face-to-face communication (video call	N	227	138	0.689
		%	35.6%	34.7%	
	B. Chat (written) communication	N	248	165	
		%	38.9%	41.5%	
	C. Other	N	163	95	
		%	25.5%	23.9%	
Are you learning or teaching same as you were before the COVID-19 Pandemic?	A. No	N	191	146	0.022
		%	29.9%	36.7%	
	B. Somewhat	N	283	144	
		%	44.4%	36.2%	
	C. Yes	N	164	108	
		%	25.7%	27.1%	
Do you feel stressed while online learning and teaching during the Covid-19 pandemic?	A. Not at all Stressful	N	123	58	0.046
		%	19.3%	14.6%	
	B. Slightly Stressful	N	222	131	
		%	34.8%	32.9%	
	C. Moderately Stressful	N	155	95	
		%	24.3%	23.9%	

	D. Very Stressful	N	74	53
		%	11.6%	13.3%
	E. Extremely Stressful	N	64	61
		%	10.0%	15.3%

A comparison of characteristics of Chinese participants and foreigners was made using a chi-square or exact test. Age showed a statistically significant difference as the percentage of those between the ages of 18 and 25 was higher in foreign cases (85.2%) than in Chinese (47.8%), p-value<0.001. In addition, gender showed a statistically significant difference in the percentage of females in Chinese cases (58.9%) than in foreigners (45.7%), p-value< 0.001. Students or teachers showed a significant difference as the percentage of students in foreigners (97.5%) was higher than that of Chinese students (77.3%), p-value< 0.001. Assessment of internet performance while online teaching during the COVID-19 pandemic revealed a significant difference as the percentage who had bad assessments was higher in foreigners (17.1%) than in Chinese (10.2%), p-value= 0.014.

Furthermore, the responses to the question “Do you think online learning or teaching during a pandemic is effective and useful” indicated a statistically significant difference as the percentage of those who thought online learning or teaching during a pandemic was moderately effective and useful was higher in Chinese (21.6%) than in foreigners (14.6%), p-value= 0.025. What is the main struggle during the pandemic showed a statistically significant difference as the percentage of who their main struggle during the pandemic was travelling and quarantine in Chinese (30.6%) was higher than foreigners (22.4%), p-value= 0.024. Additionally, the “are you agree with the continuing study by online teaching” question reflected a statistically significant difference as the percentage of those who did not agree with the continuing study by online teaching in teachers (28.9%) was higher than in Chinese (15.4%), p-value< 0.001. Had there been an impact on your personality and personal

life during the pandemic showed a statistically significant difference as the percentage who said yes was higher in foreigners (60.3%) than in Chinese (51.1%), p-value= 0.004. Do you think online communication was easy and effective showed a statistically significant difference as the percentage of those who said yes in Chinese (52.0%) was higher than in foreigners (36.2%), p-value< 0.001. Moreover, the responses to the question “Do you enjoy online learning and teaching” indicated a statistically significant difference as the percentage who said no, there were many difficulties was higher in foreigners (31.4%) than in Chinese (26.0%), p-value= 0.029. Do you have difficulty with staying focused while explaining and learning during online learning revealed a significant difference as the percentage of those who said “I sometimes find it difficult” was higher in Chinese (29.8%) than in foreigners (21.6%), p-value= 0.038. Similarly,do you think online learning and teaching will be helpful to improve your career life showed a statistically significant difference as the percentage who said yes in Chinese (41.4%) was higher than in foreigners (35.2%), p-value= 0.046. Are you learning or teaching the same as you were before the COVID-19 Pandemic showed a statistically significant difference as the percentage of who sometimes said in Chinese (44.4%) was higher than foreigners (36.2%), p-value= 0.022. Finally, the question “do you feel stressed while online learning and teaching during the Covid-19 pandemic” showed a statistically significant difference as the percentage of who said extremely stressful in foreigners (15.3%) was higher than in Chinese (10.0%), p-value= 0.046 as presented in

(Table 3) . Regarding the statistical analysis of the responses between Chinese and international students, the results showed that the tested age ranges were categorized into three ranges, 18-28 (47.80% Chinese vs. 85.20% foreigner students), 26-35 (39.00% Chinese vs. 10.60% foreigner students), and more than 35 (13.20% Chinese vs. 4.30% foreigner students) as presented in Figure 14. In addition, the gender results indicated that the percentage of foreign males is more abundant (41.10% Chinese vs. 54.30% foreign males), while the percentage of Chinese females was higher than foreign ones (58.90% Chinese vs. 45.70% foreign females) (Figure 15).

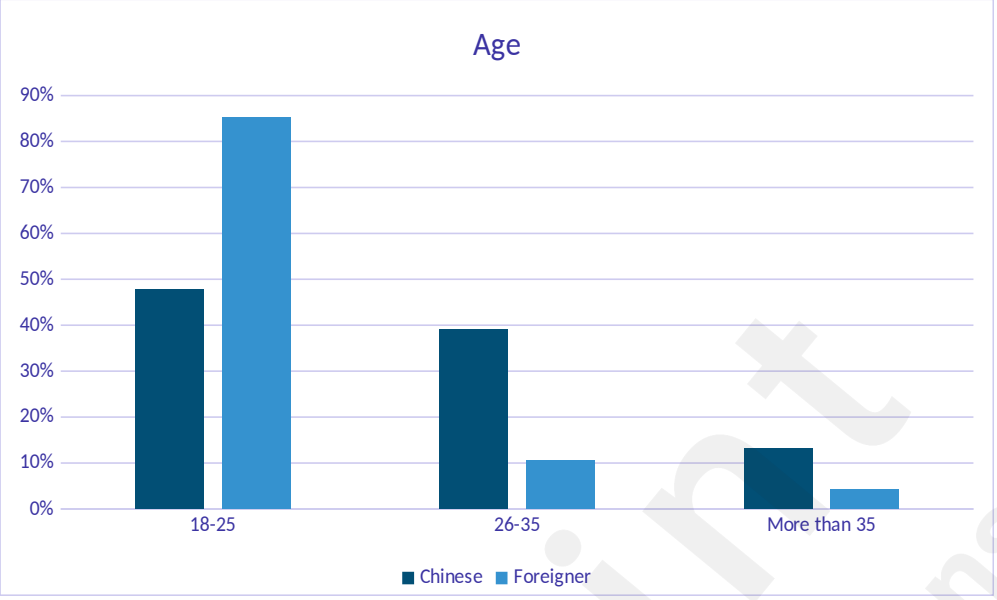


Figure 14. Bar chart for age across Chinese and foreigners

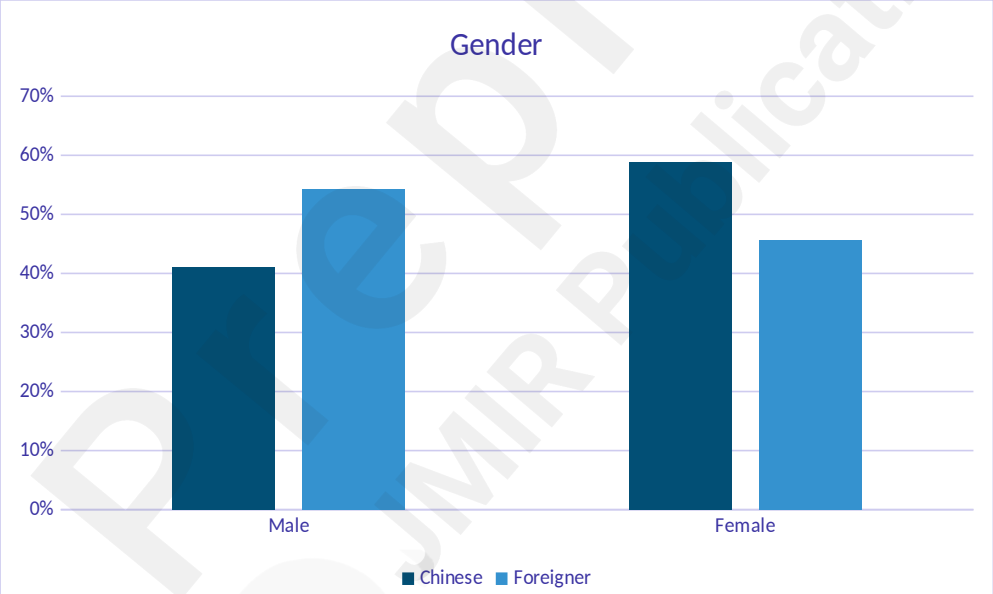


Figure 15. Bar chart for gender across Chinese and foreigners

The percentage of Chinese teachers was higher than the international ones (22.70% Chinese vs. 2.50% foreigner), whereas the percentage of international students was significantly higher than Chinese ones (77.30% Chinese vs. 97.50% foreigners) (Figure 16). The responses to the question “assessment of the internet performance while online teaching during COVID-19” were arranged as

follows; excellent (33.20% Chinese vs. 31.40% foreigners), acceptable (31.80% Chinese vs. 29.90% foreigners), good (24.80% Chinese vs. 21.60% foreigners), and bad performance (10.20% Chinese vs. 17.10% foreigners) as shown in Figure 17.

Furthermore, Figure 18 revealed that online learning and teaching were extremely effective and useful among Chinese and foreigners (33.20% Chinese vs. 33.40% foreigners), followed by very effective and useful (19.70% Chinese vs. 22.10% foreigners), moderately effective and useful (21.60% Chinese vs. 14.60% foreigners), slightly effective and useful (16.50% Chinese vs. 16.80% foreigners), and not at all effective and useful (8.90% Chinese vs. 13.10% foreigners) (Figure 18).

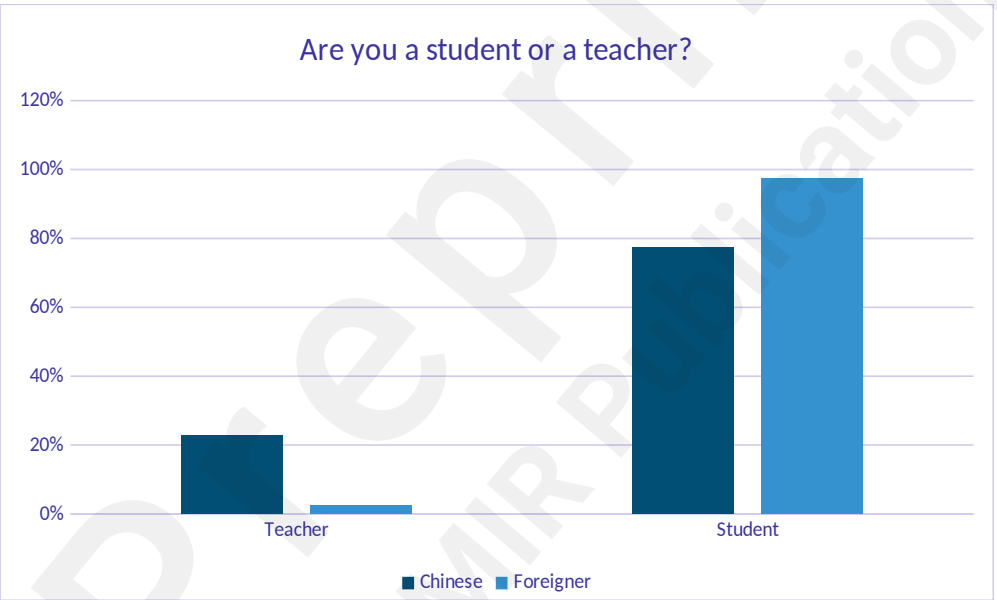


Figure 16. Bar chart for Are you a student or a teacher across Chinese and foreigners

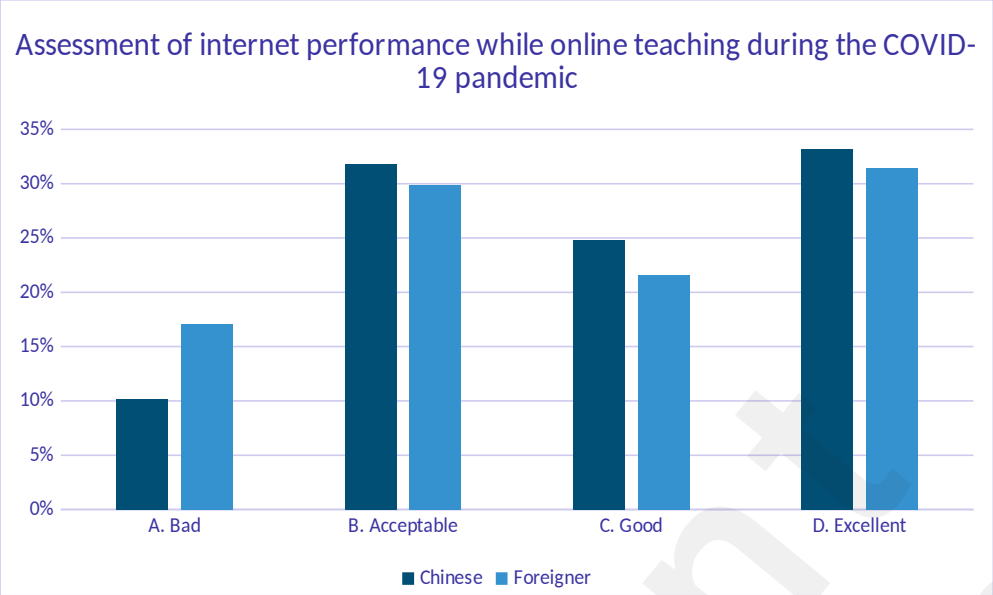


Figure 17. Bar chart for assessment of internet performance while online teaching during the COVID-19 pandemic across Chinese and foreigners

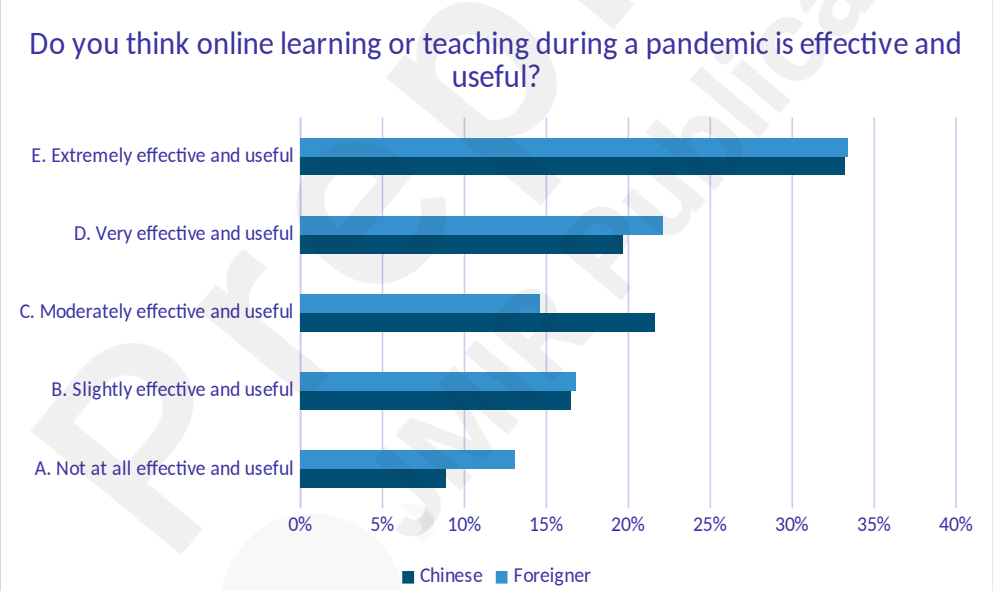


Figure 18. Bar chart for do you think online learning or teaching during a pandemic is effective and useful pandemic across Chinese and foreigners

According to the responses to the question “what is the main struggle during the pandemic” the main struggle for the Chinese was travelling and quarantine (30.60% Chinese vs. 22.40% foreigners). In contrast, the main struggle for international teachers and students was online classes

(30.10% Chinese vs. 34.20% foreigners), followed by financial problems (26.00% Chinese vs. 26.60% foreigners) and depression and anxiety (13.30% Chinese vs.18.80% foreigners) (Figure 19). Foreign participants disagreed with continuing the study through online teaching (15.40% Chinese vs. 28.90% foreigners). In contrast, Chinese participants found that it is acceptable to continue the study through online teaching (33.50% Chinese vs. 22.60% foreigners), followed by “agree” (22.40% Chinese vs. 20.10% foreigners), and “strongly agree” (28.70% Chinese vs. 28.40% foreigners) as figured out in Figure 20.

Moreover, there was a significant correlation between Chinese and foreign interviewees in the responses to “had there been an impact on your personality and personal life during the pandemic” as “yes” (51.10% Chinese vs. 60.30% foreigners) and “no” (48.90% Chinese vs.39.70% foreigners) showing that the pandemic period had some impacts on foreign participants than Chinese ones (Figure 21). Figure 22 explains whether the online communication was easy and effective; the results showed that it was “not effective” (48.00% Chinese vs. 63.80% foreigners) and “yes” (52.00% Chinese vs. 36.20% foreigners), respectively. The responses of foreign and Chinese interviewees to the question “do you enjoy online learning and teaching” were opposing each other, as Chinese responses were “no, not at all” (14.70%), “no, there are many difficulties” (26%), “yes, although there are few things I would like to modify” (33.10%), and “yes, surely” (26.20%). While foreign responses were 18.80%, 31.40%, 27.90%, and 21.90% , respectively (Figure 23).

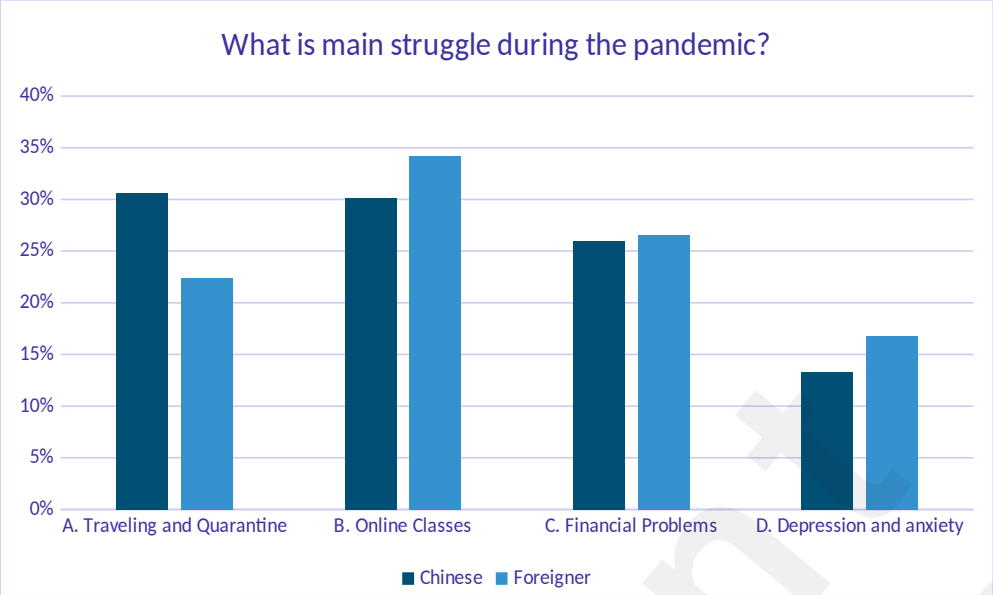


Figure 19. Bar chart for What is the main struggle during the pandemic across Chinese and foreigners

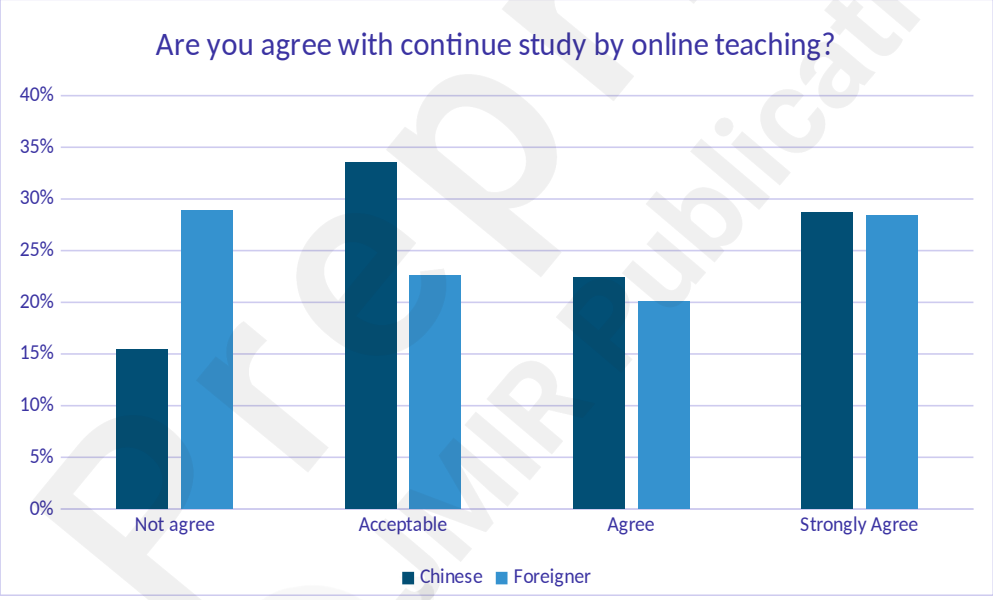


Figure 20. Bar chart for are you agree with continue study by online teaching across Chinese and foreigners

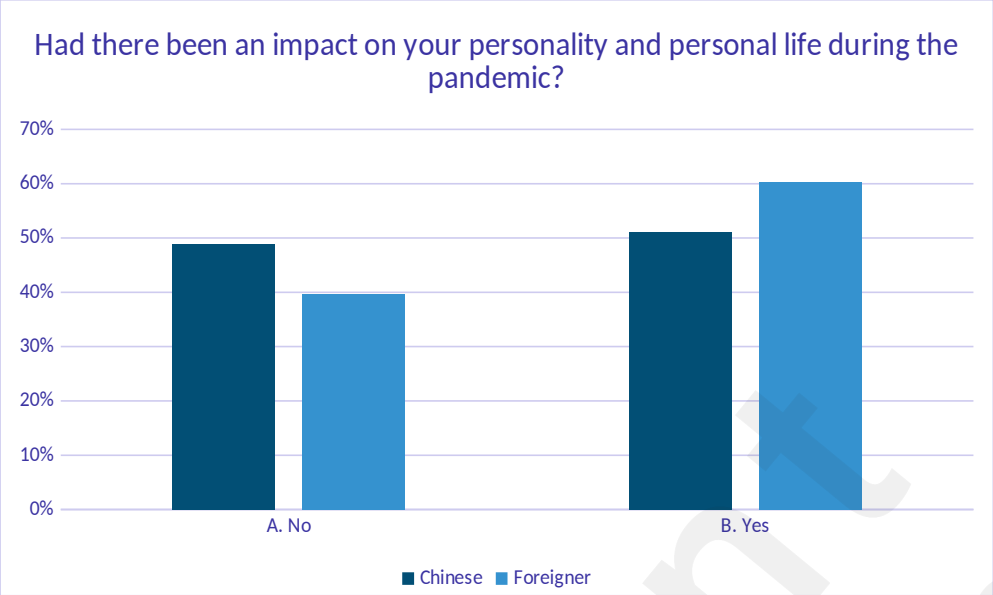


Figure 21. Bar chart for had there been an impact on your personality and personal life during the pandemic across Chinese and foreigners

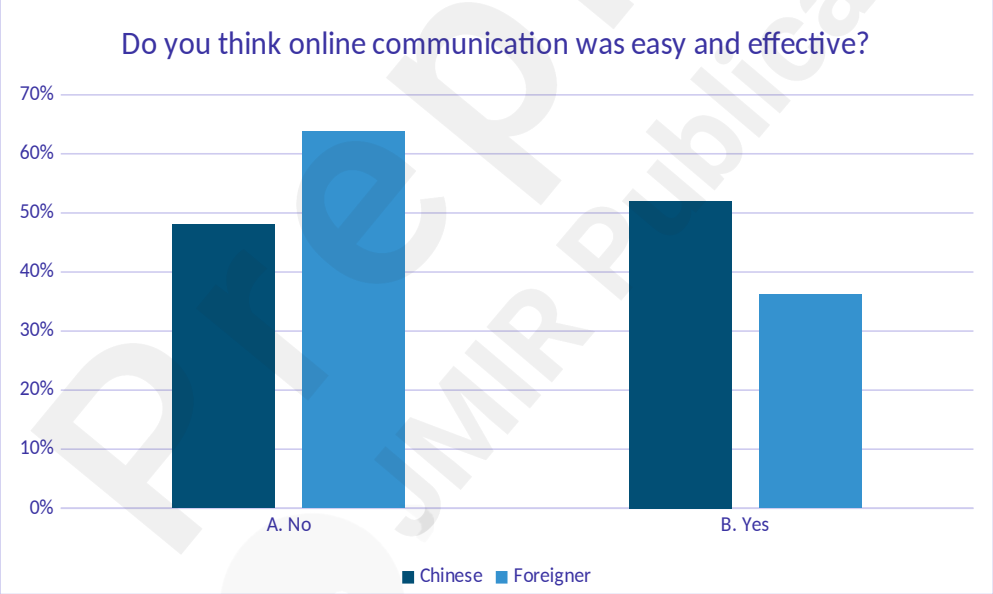


Figure 22. Bar chart for do you think online communication was easy and effective across Chinese and foreigners

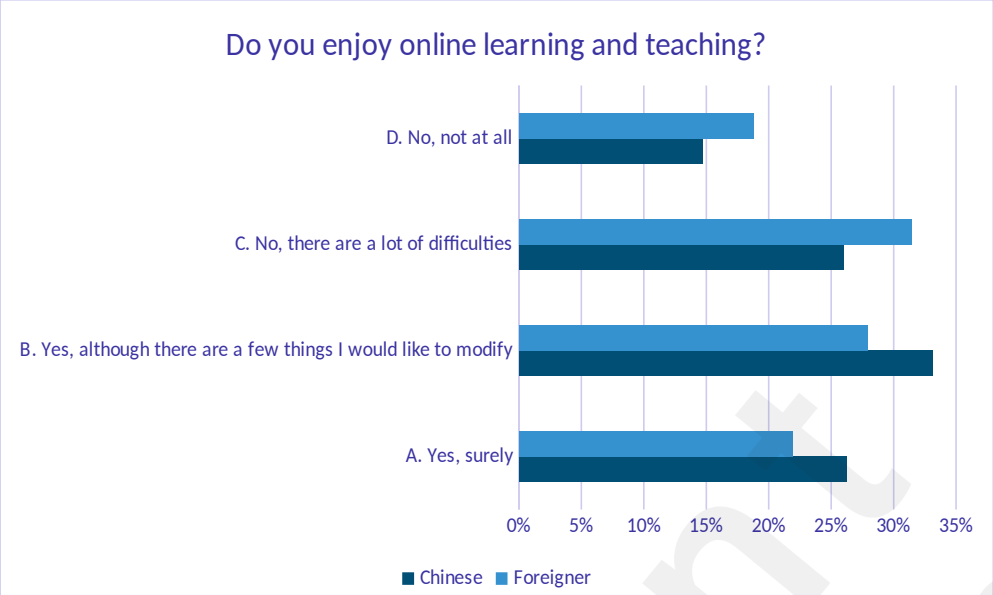


Figure 23. Bar chart for do you enjoy online learning and teaching across Chinese and foreigners

Figure 24 revealed that the responses to the question “do you have difficulty with staying focused while explaining and learning during online learning” the answers were about the presence of some difficulties during the online learning as “usually find it difficult” (29.30% Chinese vs. 31.40% foreigners), “sometimes find it difficult” (29.80% Chinese vs. 21.60% foreigners), “always find it difficult” (19.70% Chinese vs. 23.90% foreigners), “rarely find it difficult” (11.80% Chinese vs. 14.60% foreigners), and “never find it difficult” (9.40% Chinese vs. 8.50% foreigners) (Figure 24). Regarding the responses of the interviewees to the question, “do you think online learning and teaching will be helpful to improve your career life” both Chinese and foreign participants answered with “no” (58.60% Chinese vs. 64.80% foreigners) and a few percentages expected that it would be helpful (41.40% Chinese vs. 35.20% foreigners) (Figure 25). In addition, the results of collected responses to the question “are you learning or teaching the same as you were before the COVID-19 pandemic” revealed that “somewhat” was the most abundant answer among all participants (44.40% Chinese vs. 36.20% foreigners), followed by “no” (29.90% Chinese vs. 36.70% foreigners) and “yes” (25.70% Chinese vs. 27.10 foreigners) (Figure 26). About the psychological effects of online learning on participants, the responses to the question “do you feel stressed while online learning and

teaching during the COVID-19 pandemic" were as follows; "slightly stressful" (34.80% Chinese vs. 32.90% foreigners), " moderately stressful" (24.30% Chinese vs. 23.90% foreigners), "not at all" (19.30% Chinese vs. 15.30% foreigners), and "very stressful" (11.60% Chinese vs. 13.30% foreigners) as shown in Figure 27.

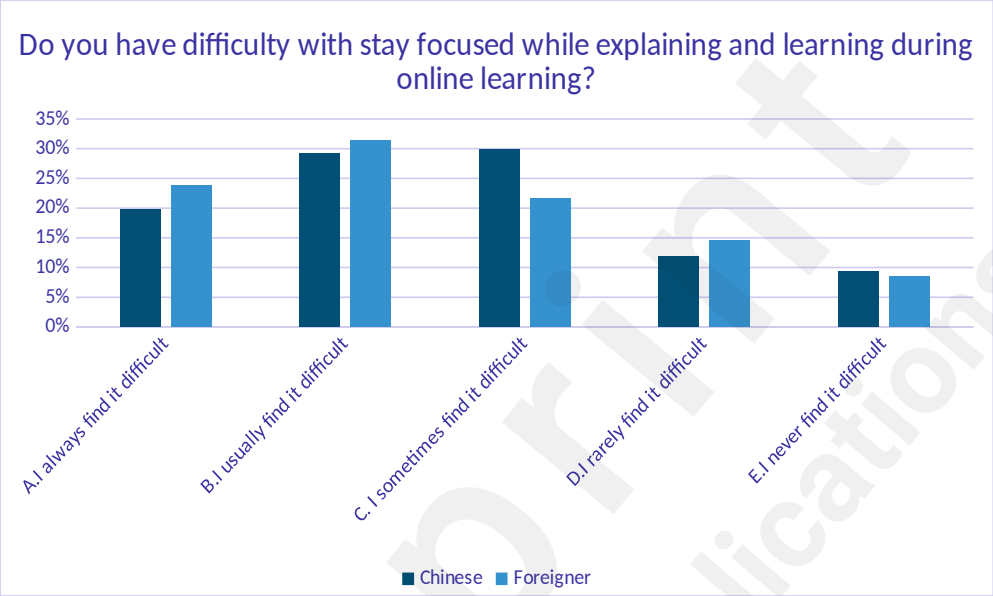


Figure 24. Bar chart for do you have difficulty with stay focused while explaining and learning during online learning across Chinese and foreigners

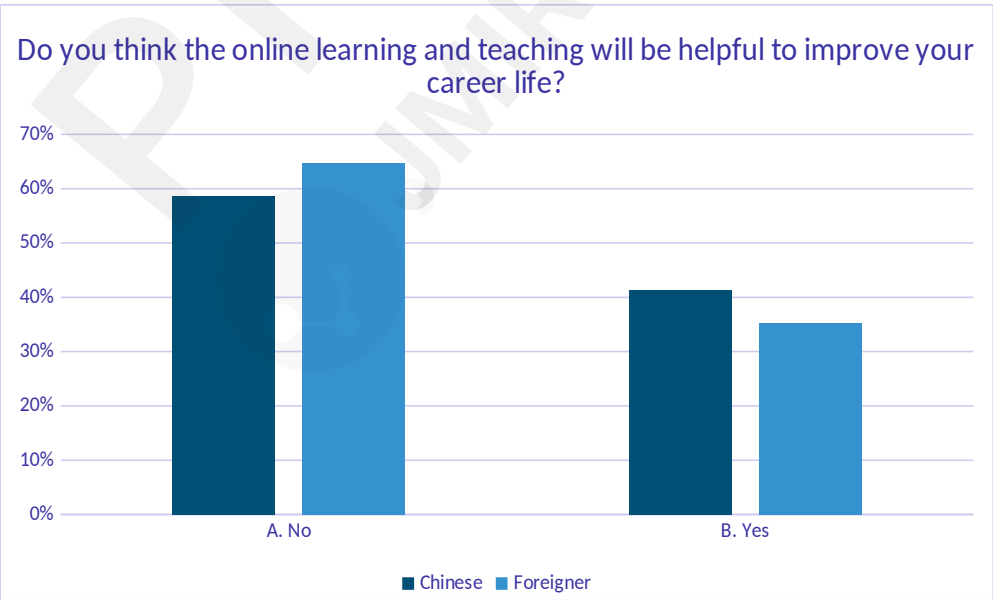


Figure 25. Bar chart for do you think the online learning and teaching will be helpful to improve your career life across Chinese and foreigners

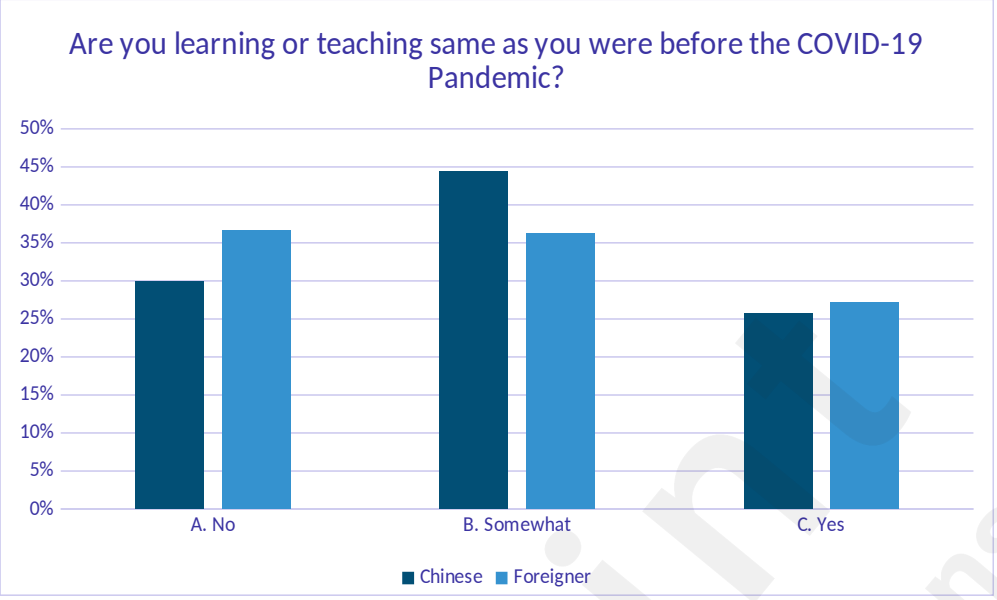


Figure 26. Bar chart for are you learning or teaching same as you were before the COVID-19 Pandemic across Chinese and foreigners

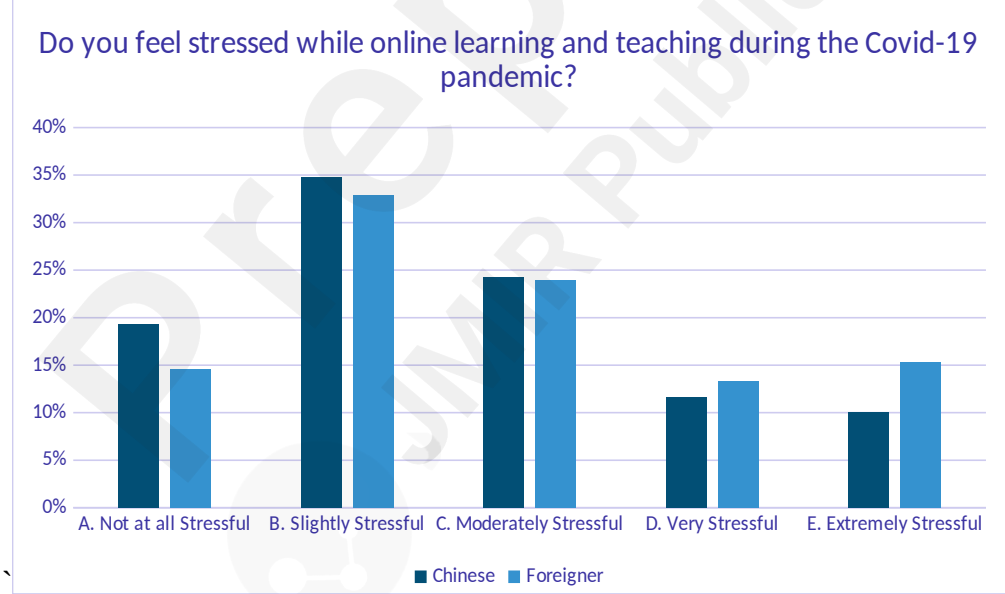


Figure 27. Bar chart for do you feel stressed while online learning and teaching during the Covid-19 pandemic across Chinese and foreigners

Discussion

In order to overcome and prevent the spreading of COVID-19, the Chinese ministry of education initiated the online learning and teaching system during the pandemic period. Online education was

established using live streaming teaching platforms like ZOOM, Rain, and Tencent classrooms. The current research indicated that teachers and students supported online education during the pandemic. Moreover, our findings revealed that online learning and teaching successfully prevented the spread of infectious diseases(9-11). During the online teaching process, most teachers and students could adapt to new teaching forms. These results showed disagreement with Singh-Manoux et al. (2012), who investigated that teachers were less able to adapt to online teaching due to intellectual deterioration and cognitive loss associated with age, and elderly persons may be slower to adopt new ideas(15). Interestingly, many teachers found that online learning was not excellent enough and not extremely effective than students; this may be due to the bad internet performance and too many tasks had been assigned to them (16). Teachers thought the students had low learning efficiency due to the home isolation or quarantine (17). In addition, some students refuse independently learning than face-to-face classes and communication (18). Thus, during the pandemic, teachers should try to communicate more effectively and be friendly with students, make online classes more attractive by providing engaging activities, and clarify all required tasks before starting the class. Furthermore, several college students have received a substantial amount of information on the COVID-19 pandemic via network platforms and mobile applications, which has the potential to trigger psychological stress problems (19). According to the present results, students had slight stress during their online classes reflecting their willingness to improve their learning ability and their awareness and maturity to overcome the pandemic. This is considered one of the advantages of online learning as it increases the applicants' responsibility.

Additionally, international interviewees showed that online classes were very effective and useful, agreeing with the Chinese ones; this may be due to the acceptable internet performance and the well-designed virtual class provided by the instructor, including the course content and lecturer ability as mentioned by Gupta & Saks (2013)(20). International students' results revealed that online classes were one of the main struggles during the e-learning, most of them refused to continue their studies

through e-learning classes, and others found some difficulties in online communication as it was not easy and effective. Accordingly, they thought that online learning and teaching will not help improve their careers live. Furthermore, the e-learning classes changed the personality and the learning ability of international students rather than Chinese ones. These may be due to the unanticipated fully online learning due to the COVID-19 pandemic, which eventually has its disadvantages; as previously mentioned by Attardi et al. (2016), students feel less engaged by teachers and more distracted by their surroundings in the virtual format. In addition, these results may be due to the lack of hands-on exercises and the inapplicability of some students lacking self-discipline(21). This may clarify why students preferred face-to-face classroom learning, and a similar response was also documented in prior research (22, 23). Many studies focused on the effectiveness and the teachers' and students' feedback about online teaching and learning during the pandemic. Maheshwari (2021) investigated the factors that affected the students' (undergraduates and postgraduates) intentions to study online during COVID-19 in Vietnam. The outcomes indicated that institutional support and perceived enjoyment (satisfaction) influence students' potential intentions to enroll in an online class. Perceived enjoyment impacts online learning intentions, while it is influenced by ICT infrastructure, including internet speed and accessibility. Consequently, this study introduces a new variable described as extrinsic elements (ICT infrastructure and internet connectivity), which indirectly impact students' inclinations to learn online. Despite this generation's greater reliance on smartphones, it is prudent to include mobile technology in online learning, and QR codes can be one of the methods to use it (24). Furthermore, it is suggested that lecturers be encouraged to use videos, audios, and instant messaging to communicate with and offer feedback to students in order to enhance their perceived satisfaction with online learning. In a study by Tsang et al. (2021), Student-to-student discussion and curriculum design were found to be predictive of perceived learning results, whereas instructor-to-student dialogue determined student initiative. There was no substantial correlation between university assistance and either perceived learning results or a student initiative. In terms of learning

effectiveness, student satisfaction was decided by both perceived academic achievement and student initiative. Student-to-student discussion, course design, and instructor-to-student interaction were found as the most significant predictors of COVID-19 online learning (CoOL) learning efficacy, which may decide the eventual success of CoOL(25). In addition, Nambiar (2020) highlighted the perspectives and concerns of college and university instructors and students regarding the requirement to take online coursework in India. The findings showed that concerns raised by professors and students emphasized the need for more research and study to give more precise information for modifying the design and technique of online programs. Providing an organized and user-friendly environment for online learning that is accessible to all without imposing a cost burden on students and teachers should be the primary concern of college and university administration when promoting online education. Moreover, it should be a priority to provide teachers with proper technological training on how to conduct online courses since this is a requirement for the effective adoption of online classrooms(26). Vagos and Carvalhais (2022) studied the student-teacher relationship (STR), examined students' and instructors' assessments of student-teacher relationship (STR) quality and quality of life following online and classroom instruction, and explored whether STR quality correlates with students' and teachers' emotional well-being. Teachers did not notice variations in teacher-student quality during the study time, but students reported more conflict following classroom instruction. Proximity in STR was linked with improved well-being, whereas conflict was associated with decreased well-being, although multiple dimensions of quality of life were implicated across times and between instructors and students. These results concur with the concept that online teaching is an impersonal experience for students, where conflict is lower due to the absence of social stimuli; alternatively, teachers may be encouraged to utilize the STR to sustain better positive outcomes when teaching online for themselves and their students(27).

Limitations :

In this study we discovered that the majority of medical students and teachers had access to and skill with electronic devices. we also discovered that teachers and students favored online education during the pandemic. However our study was done at some universitys in a certain way. So, the results can't be applied to all universities, and they need to be confirmed by more studies at different universities to get a full picture of how useful the online learning platform will be as a way to learn and teach in the future.

Conclusions:

Most instructors and students supported and were delighted with the adoption of online education. Although teachers were less adaptive to online education, many still had favorable evaluations. The acceptability of online instruction was affected by sexual orientation. Although online learning has benefits, it cannot fully replace conventional offline education. As online education is a trend for the future of education, institutions should increase their efforts to improve it, focusing particularly on professors and students. To conclude, if well-designed, online learning and teaching is a viable option for foreign and Chinese students and teachers, and it can be an effective alternative when the offline classroom is suspended during the pandemic. Moreover, in the future online learning and teaching cannot replace the necessity for face-to-face learning, but it can supplement/support the traditional classroom-based learning approach.

Abbreviations :

(CoOL): COVID-19 online learning ; STR: Student-teacher relationship; ICT: Information and communications technology; COVID-19 : coronavirus pandemic

Ethics approval Consent for publication

Written informed consent was obtained from the teachers and students. Upon request, a copy of the consent form is available for review by the Editor of this journal

Availability of data and materials section

The dataset supporting the conclusions of this article is included with the article.

Competing interests

The author declares that they have no competing interests.

Fundings

Not applicable

Author contributions

HL designed the study, EZZI, HY and YD performed data collection, analyzed the results, AA, ZW, JL and ZW drafted the manuscript. The authors have read and approved the final manuscript.

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