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香港教育大學
The Education University of Hong Kong

A Project entitled

Exploring Hong Kong undergraduate students' perceptions of online learning: Advantages and challenges with regard to interaction and their effects on students' satisfaction

by

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Declaration

I, *Hui Pui Yee*, declare that this research report represents my work under the supervision of Dr. Fok Ping Kwan, and that it has not been submitted previously for examination to any tertiary institution.

Signed:_____

Hui Pui Yee

April 2021

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Secondly, special thanks is also given to the 12 Hong Kong graduate students who participated in the follow-up interviews, which allowed me to gather latest information about online education in Hong Kong.

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Abstract

In this research, a mixed method methodology was used to study Hong Kong undergraduate students' perceptions of advantages and challenges of online learning with regard to interaction. Their effects on students' level of satisfaction were found. The 215 surveys and 12 follow-up interviews showed that students perceived more flexible to use communication tools as an advantage of online learning with regard to interaction while they perceived chance of communication as both an advantage and a challenge. In addition, they perceived delay of responses and feedback and lack of effectiveness of interaction as challenges of online learning. It was also found that advantages and challenges of online learning were correlated with students' perception on the level of satisfaction.

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1.Introduction

From the late 1900 onwards, including e-Learning in school curriculum has become a significant part in the educational reform in Hong Kong. The government proposed three documents in 1998, 2004 and 2008 respectively to widely promote e-Learning in local schools (Kong et al., 2014). Due to the outbreak of COVID-19, learning and teaching were made compulsory to be migrated from the face-to-face approach to virtual classrooms, which provided more chance for Hong Kong students to experience online learning.

Education experts emphasised interaction as an important element in quality online education (Su et al., 2005). It is also regarded as a factor affecting students' satisfaction (cited in Alqurashi 2019). Therefore, studying the perceptions of learners' in online learning is useful to help construct more sufficient guidelines in online learning which could improve students' learning experience (Song et al., 2004).

1.1 Research Topic

Exploring Hong Kong undergraduate students' perceptions of online learning: Advantages and challenges with regard to interaction and their effects on students' satisfaction

1.2 Research Question

1. How Hong Kong undergraduate students perceive the advantages of online learning with regard to interaction?

2. How Hong Kong undergraduate students perceive the challenges of online learning with regard to interaction?

3. How do Hong Kong undergraduate students' perceptions of the advantages and challenges of interaction affect their satisfaction in interaction during online learning?

1.3 Key concepts

Hong Kong undergraduates, online learning, e-learning, perceptions, interaction, communication, satisfaction, advantages, challenges, COVID-19

2. Literature Review

2.1 Definition of Online learning

The book, *Theory and practice of online learning* written by Ally (2004), define online learning as follows:

> The use of the Internet to access learning materials; to interact with the content, instructor, and other learners; and to obtain support during the learning process, in order to acquire knowledge, to construct personal meaning, and to grow from the learning experience. (p.5)

2.2 Interaction

2.2.1 Definition of interaction

Moore (1989) stated that there are three types of interaction. In Learner-Instructor interaction, the instructor is taking the role to present the content, show skills, give feedback and encourage to learners. Students can raise questions and make responses in different learning activities. For Learner-Learner interaction, it refers to members of a learning group interacting with each other to exchange ideas with or without the presence of the instructor. And the third one is Learner-Content interaction.

2.2.2 Students' perceptions of advantages of online learning with regard to interaction

Students perceived more opportunities to interact with classmates and teachers as an advantage of online learning. Students in the study of Kim, Liu and Bonk (2005) told that compare to face-to-face learning, they could interact with teachers more closely when study online. Peers they didn't know, and the teacher could all engage in discussions. Vonderwell (2003) found that students who were afraid of their peers' perception would have more chance to raise

questions to teachers. Students also found more relaxed and natural to communicate with instructors and other learners. They got chance to interact at any time (Obeidat, 2021).

Students perceived a variety of methods to interact with instructors and peers as an advantage of online learning. In the study of Song et al. (2004), students expressed they could use different technological tools such as bulletin boards, chat and emails to communicate with teachers when they were convenient. Students who did not feel confident could use WhatsApp as the way to communicate with others (Mukhtar et al. 2020). In Parker's (2012) study, learners thought that discussion boards and email were enough for communicating with others. Videos and PowerPoint presentations, which one could use them anytime conveniently were also helpful for learning. 131 undergraduate students who joined the study of Obeidat (2021) admitted that online learning had provided them the chance to use different platforms to join the classes. Microsoft Teams or establishing groups through social media were examples.

2.2.3 Students' perceptions of challenges of online learning with regard to interaction

In Xiong et al.'s (2020) survey, among 1227 Hong Kong undergraduate students' responses, 42% of them perceived lack of interactions as a challenge of online learning. Students perceived insufficient chance to interact with peers and teachers as a challenge of online learning. The undergraduates from the study of Ku and Lohr (2003) felt that there were not enough interactions between students and instructors. Hong Kong students who registered a nursing programme pointed out that the main problem of online learning was the 'human contact element', which more than 60% of the participants thought that there was 'inadequate opportunity to discuss with teachers' and 'to establish peer support'. A student expressed that he just felt like having conversation with the computer (Sit et al., 2005). Students from Humphrey and Wiles's (2021) study perceived that they could not really raise questions as the instructors sent out posts as the way to delivery content. There was also 'a lack of one-on-one relationship with the instructor', which university students saw professors taking a role of significant helper (Vonderwell, 2003). However, in O'Shea, Stone and Delahunt's (2015) study, some interviewees stated that they did not find it necessary to engage and communicate with their peers as they could learn well by themselves.

Students perceived unfamiliarity with learning partners and delay of responses as challenges of online learning. In the study of Vonderwell (2003), most students were not comfortable to

interact with others who were not known to them online. Only a small number of students would send an email to peers to discuss content in the forum assigned by instructors and students found their groupmates did not give responses. Another disadvantage was 'the delay of immediate feedback or communication' that students could not get answers shortly Vonderwell (2003). Students suggested they disliked that there was inadequate feedback given immediately (Ku and Lohr, 2003).

Students perceived ineffective interaction as a challenge of online learning. In the study of Parker (2012), students perceived communication as less effective in online learning in comparison to face-to-face lessons. Students pointed out that there was 'poor online communication' in their learning experience. The instructors were not able to manage online ways of communication and they 'don't really know how to be a tutor for online environment' (O'Shea, Stone & Delahunt, 2015). It was found that students from Humphrey and Wiles's (2021) study also perceived that the instructors were not shifted properly to teach online. Manner (2003) stated that a feeling of 'eSolated' was constructed among students as the nature of learning online was 'impersonal'. Compare to face-to-face lessons, nonverbal cues were greatly reduced, which would affect effective communication.

2.2.4 Effect of students' perceptions on their satisfaction in interaction of online learning

There have been numerous research about students' perceptions of advantages and challenges in online learning (Barbour, McLaren & Zhang, 2012; Song, Singleton & Koh, 2004; Pedrides, 2002; Vonderwell, 2003). Students' satisfaction level between face-to-face learning and online learning were compared in some studies. For example, Trarnik, Urh and Jereb (2019) pointed out that students perceived a higher level of satisfaction when using the face-to-face approach to learn English as a whole, which the results were similar to some other studies (Roach & Lemasters, 2006; Tallent-Runnels et al., 2006).

Many studies also found out that interaction is a factor affecting learners' satisfaction in online learning (Ali, Ramay & Shahzad, 2011; Fedynich, Bradley & Bradley, 2015; Horzum, 2017; Stein, Lee, & Rha, 2009 ; Swan 2003). In Diekelmann and Mendia's (2005) study, it was suggested that levels of satisfaction among students were significantly determined by teacher-student interaction. It was pointed out by the study of Trarnik, Urh and Jereb (2017) that insufficient interaction between learners was a more important factor.

Despite the studies mentioned above about online learning, there was no specific research to examine the linkage between students' perceptions of 'advantages and challenges' and their effects on students' satisfaction in interaction of online learning. Therefore, my study is to find out the students' thoughts regarding interaction in detail with their impacts over the level of satisfaction.

3. Methodology

3.1 Research Framework

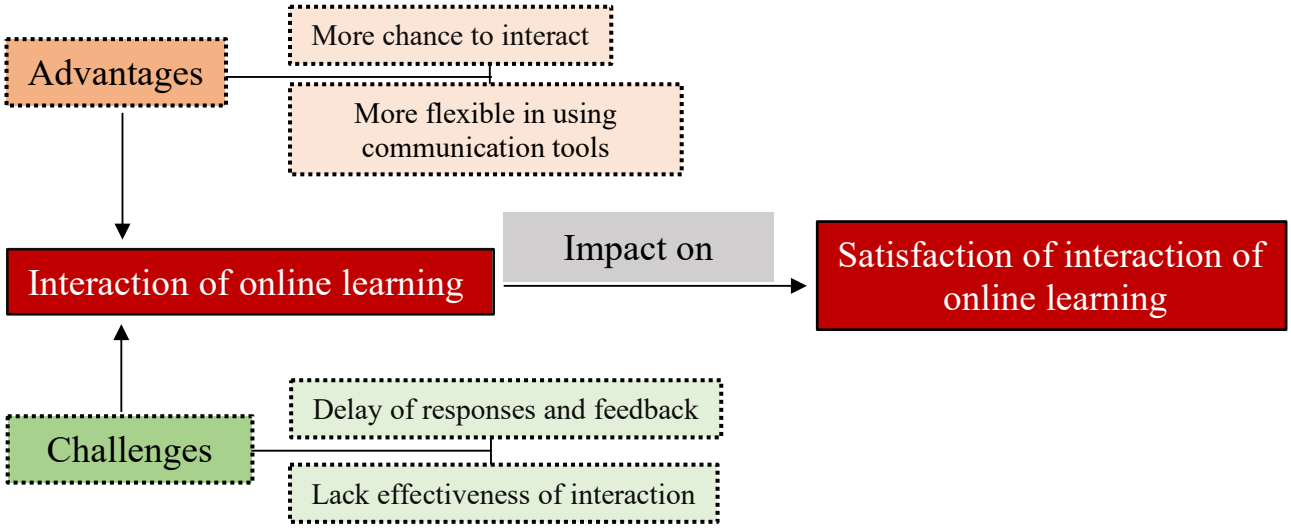


Figure a.

3.2 Participants

The purpose of this study is to explore Hong Kong undergraduate students' perceptions of online learning. Students who have enrolled in a bachelor programme in Hong Kong in 2019/2020 are the target for the study. They have experienced at least once to learn online in a university course in previous academic years.

The number of undergraduate students filled in the survey were 215 while 12 follow-up interviews were conducted afterwards.

3.3 Data collection

In this study, a mixed research methodology was used, which consisted of quantitative and qualitative research methods to collect data.

3.3.1 Quantitative research

For quantitative research, the convenience sampling was used to collect data from the undergraduate students. The questions designed in the questionnaire are based on the three research questions. This questionnaire consists of five parts. The first section is about background of the students. The second section is about students' learning preferences followed by their perceptions of the advantages and the challenges of online learning. In the fifth part, students are asked to rate the level of satisfaction of online learning. The four-point Likert scale is used in all questions in the questionnaire. SPSS was used to analyze the data collected.

3 undergraduate students were asked to try to fill in the survey as trail and amendments were made before delivering the questionnaires to the target audience.

The amendments made after the trail:

- Q6: examples of online learning were added: Zoom, discussion forum, video as the student regarded 'Zoom' as the only way of online learning, but in this study other ways of online learning also included
- Section 3/4/5: '2019/2020' was deleted in the title
- Q16: 'with my instructors and other learners in the class' was deleted as the question aimed at asking overall impression
- Q27: examples (eye contact, gestures, posture) of 'nonverbal cues' were added as students found it difficult to understand the meaning of the phrase

Frequency Table

Figure 1. Gender

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Female	154	71.6	71.6	71.6

	Male	61	28.4	28.4	100.0
	Total	215	100.0	100.0	

There was total 215 responses. 71.6% were female and 28.4% were male.

Figure 2. University in 2019/2020

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	BU	12	5.6	5.6	5.6
	CityU	15	7.0	7.0	12.6
	CUHK	32	14.9	14.9	27.4
	EdUHK	73	34.0	34.0	61.4
	HKU	16	7.4	7.4	68.8
	HKUST	17	7.9	7.9	76.7
	HSU	6	2.8	2.8	79.5
	LingU	3	1.4	1.4	80.9
	OU	13	6.0	6.0	87.0
	PolyU	20	9.3	9.3	96.3
	SYU	8	3.7	3.7	100.0
	Total	215	100.0	100.0	

Figure 3. Year of study in 2019/2020

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1	7	3.3	3.3	3.3
	2	19	8.8	8.8	12.1
	3	36	16.7	16.7	28.8
	4	99	46.0	46.0	74.9
	5	52	24.2	24.2	99.1
	6	2	.9	.9	100.0
	Total	215	100.0	100.0	

Figure 4. Discipline of study in 2019/2020

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Education	65	30.2	30.2	30.2
	Business	35	16.3	16.3	46.5
	Social Sciences	37	17.2	17.2	63.7
	Humanities	35	16.3	16.3	80.0
	Sciences	27	12.6	12.6	92.6
	Medicine	16	7.4	7.4	100.0

	Total	215	100.0	100.0	

Figure 5. Year GPA in 2019/2020

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	2.00-2.99	33	15.3	15.3	15.3
	3.00-3.19	61	28.4	28.4	43.7
	3.20-3.49	68	31.6	31.6	75.3
	>3.50	53	24.7	24.7	100.0
	Total	215	100.0	100.0	

3.3.2 Qualitative research

For qualitative research, the participants who expressed their willingness to participate in the follow-up study were invited to join a semi-structed interview. 12 participants were interviewed, aiming at collecting more details to explain undergraduate students' perceptions of the advantages and challenges of online learning, and their effects on satisfaction in interaction during online learning. NVIVO, the software was used to conduct data analysis.

4. Results and Findings

In this section, the findings from the quantitative and qualitative research are shown.

4.1 Quantitative research

Descriptives

Figure 6. Descriptive Statistics

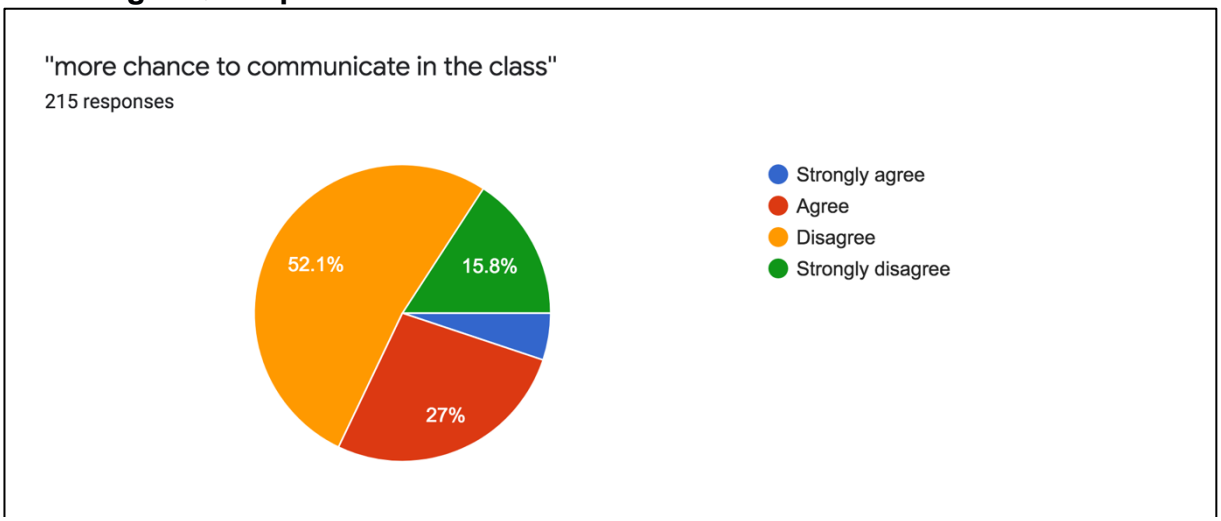
	N	Minimum	Maximum	Mean	Std. Deviation
AVEPrefer	215	1.00	3.60	2.0726	.50041
AVEAdv	215	1.00	4.00	2.4381	.49656
AVEComm	215	1.00	4.00	2.6074	.59558
AVEFlex	215	1.00	4.00	2.2688	.54935
AveChal2	215	1.00	3.10	2.0926	.45809
AVEChaFE	215	1.00	3.80	2.1879	.53551
AVEChaEff	215	1.00	3.00	1.9972	.47928
AVESat	215	1.00	4.00	2.3247	.52069
Valid N (listwise)	215				

AVEPrefer: Learning preferences (Q7-11)
AVEAdv: Perception of the advantages (Q12-21)
AVEComm: Chance to communicate (Q12-16)
AVEFlex: Flexibility of communication tools (Q17-21)
AVEChal2: Perception of the challenges of online learning (Q 22-31)
AVEChaFE: Delay of responses and feedback (Q 22-26)
AVEChaEff: Lacking effectiveness of interaction (Q27-31)
AVESat: Satisfaction of online learning (Q32-36)

Respondents were asked to used Likert scale to answer Questions 7-36. (From 1 as Strong agree to 4 as Strongly disagree) The table above showed the descriptive statistics. The mean for items regarding advantages of interaction is 2.4381 and that of challenges is 2.0926, which is near to agree For satisfaction, it is 2.2347.

It showed that respondents' perceptions of the advantages of interaction mentioned in the questionnaire were between agree and disagree. For challenges, respondents agreed the items. For how the advantages and challenges affected their level of satisfaction, it is nearer to agree.

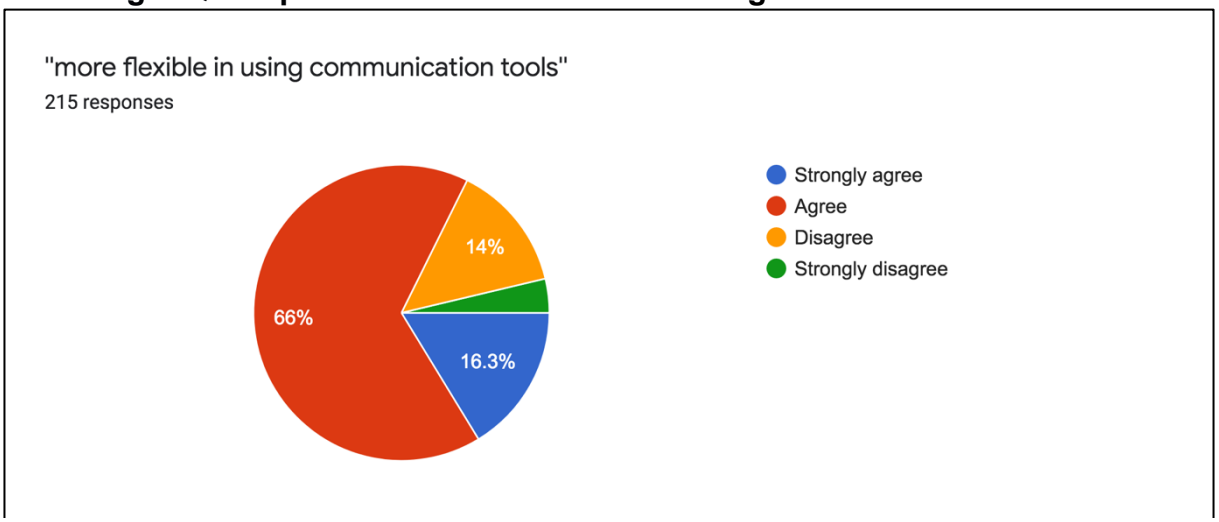
Figure 7.
Advantage: Q16. I perceived more chance to communicate in the class



- Strongly agree and Agree: 20.9%
- Strongly disagree and Disagree: 79.1%

It indicated that majority of Hong Kong undergraduate students perceived ‘more chance to communicate in the class’ not an advantage of online learning.

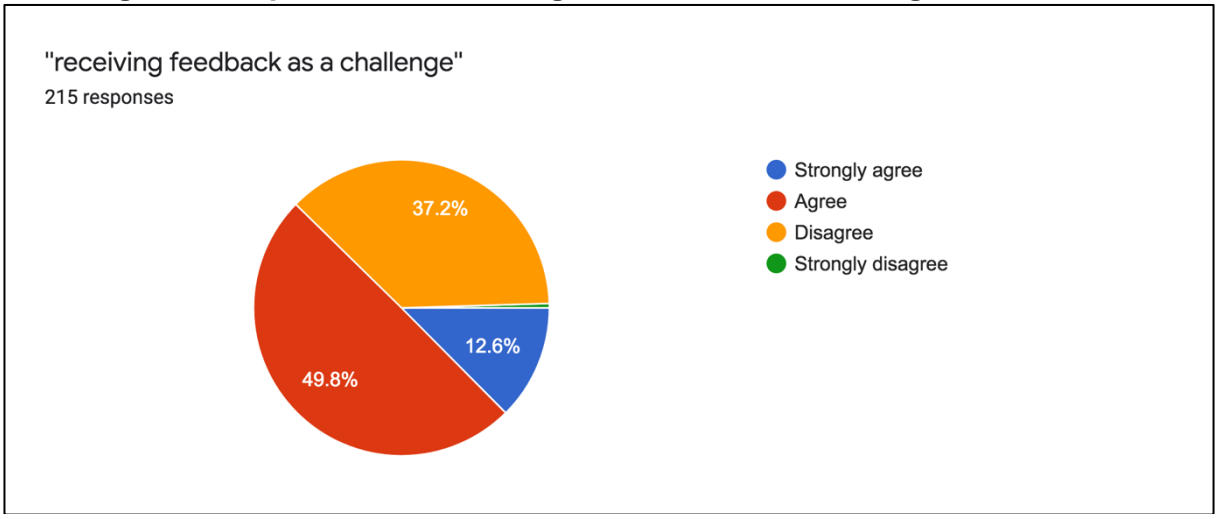
Figure 8.
Advantage: Q21. I perceived more flexible in using communication tools



- Strongly agree and Agree: 82.3%
- Strongly disagree and Disagree: 17.7%

It indicated that majority of Hong Kong undergraduate students perceived ‘more flexible in using communication tools’ an advantage of online learning.

Figure 9.
Challenge: Q26. I perceived receiving feedback as a challenge

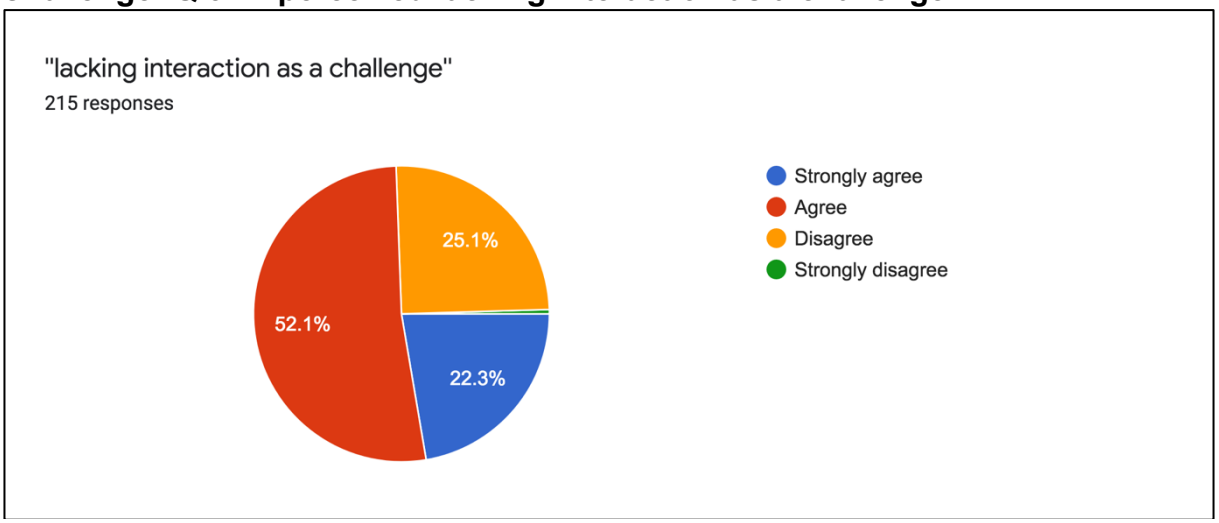


- Strongly agree and Agree: 62.4%

- Strongly disagree and Disagree: 37.6%

It indicated that Hong Kong undergraduate students had different perceptions of ‘receiving feedback as a challenge’ in online learning.

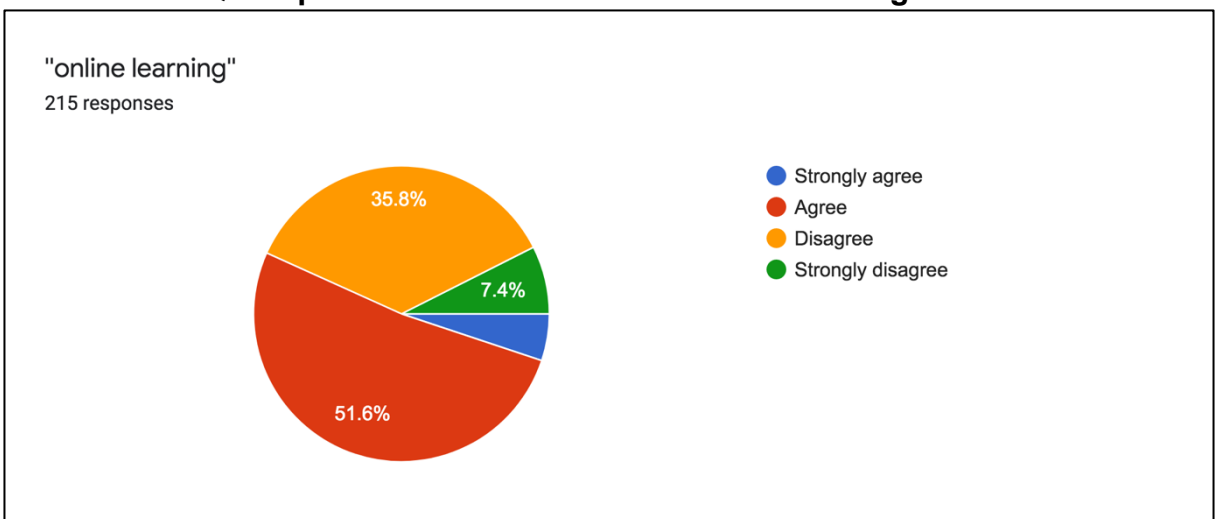
Figure 10.
Challenge: Q 31. I perceived lacking interaction as a challenge



- Strongly agree and Agree: 74.4%
- Strongly disagree and Disagree: 25.6%

It indicated that ‘lacking interaction’ was a dominated challenge that Hong Kong undergraduate students perceived in online learning.

Figure 11.
Satisfaction: Q36. I perceived satisfaction of online learning



- Strongly agree and Agree: 56.8%
- Strongly disagree and Disagree: 43.2%

It indicated that Hong Kong undergraduate students had different perceptions of how advantages and challenges affecting their satisfaction levels of online learning in terms of interaction.

T-Test

Figure 12. Group Statistics

	Gender:	N	Mean	Std. Deviation	Std. Error Mean
AVEPrefer	1	154	2.1052	.47757	.03848
	2	61	1.9902	.54946	.07035
AVEAdv	1	154	2.4494	.46600	.03755
	2	61	2.4098	.56971	.07294
AVEComm	1	154	2.6182	.55654	.04485
	2	61	2.5803	.68867	.08818
AVEFlex	1	154	2.2805	.53261	.04292
	2	61	2.2393	.59309	.07594
AveChal2	1	154	2.1396	.44169	.03559
	2	61	1.9738	.48059	.06153
AVEChaFE	1	154	2.2377	.51931	.04185
	2	61	2.0623	.55921	.07160
AVEChaEff	1	154	2.0416	.46956	.03784
	2	61	1.8852	.48916	.06263
AVESat	1	154	2.3377	.52270	.04212
	2	61	2.2918	.51843	.06638

Figure 13. Independent Samples Test

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		Levene's Test for Equality of Variances		t-test for Equality of Means						
									95% Confidence Interval of the Difference	
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	Lower	Upper
AVEPrefer	Equal variances assumed	1.244	.266	1.524	213	.129	.11503	.07547	-.03374	.26380
	Equal variances not assumed			1.435	97.846	.155	.11503	.08019	-.04410	.27417
AVEAdv	Equal variances assumed	2.907	.090	.525	213	.600	.03951	.07525	-.10882	.18784
	Equal variances not assumed			.482	93.443	.631	.03951	.08204	-.12339	.20242
AVEComm	Equal variances assumed	3.932	.049	.419	213	.675	.03785	.09028	-.14009	.21580
	Equal variances not assumed			.383	92.626	.703	.03785	.09893	-.15860	.23431
AVEFlex	Equal variances assumed	1.147	.285	.495	213	.621	.04118	.08325	-.12293	.20528
	Equal variances not assumed			.472	100.435	.638	.04118	.08723	-.13187	.21422
AveChal2	Equal variances assumed	.228	.633	2.420	213	.016	.16584	.06853	.03076	.30092
	Equal variances not assumed			2.333	102.371	.022	.16584	.07109	.02485	.30683
AVEChaFE	Equal variances assumed	.015	.902	2.184	213	.030	.17537	.08031	.01706	.33367
	Equal variances not assumed			2.115	103.267	.037	.17537	.08293	.01090	.33984
AVEChaEff	Equal variances assumed	.911	.341	2.174	213	.031	.15631	.07188	.01462	.29801
	Equal variances not assumed			2.136	106.242	.035	.15631	.07317	.01124	.30138
AVESat	Equal variances assumed	.169	.682	.581	213	.562	.04586	.07889	-.10965	.20137
	Equal variances not assumed			.583	110.990	.561	.04586	.07861	-.10992	.20164

Oneway

Figure 14. ANOVA -By Year of Study

		Sum of Squares	df	Mean Square	F	Sig.
AVEPrefer	Between Groups	3.167	10	.317	1.281	.243
	Within Groups	50.421	204	.247		
	Total	53.588	214			
AVEAdv	Between Groups	2.125	10	.212	.856	.576
	Within Groups	50.642	204	.248		
	Total	52.767	214			
AVEComm	Between Groups	3.520	10	.352	.992	.452
	Within Groups	72.389	204	.355		
	Total	75.908	214			
AVEFlex	Between Groups	3.452	10	.345	1.152	.325
	Within Groups	61.129	204	.300		
	Total	64.581	214			
AveChal2	Between Groups	2.737	10	.274	1.324	.219
	Within Groups	42.171	204	.207		
	Total	44.908	214			
AVEChaFE	Between Groups	5.285	10	.529	1.923	.044
	Within Groups	56.083	204	.275		
	Total	61.369	214			
AVEChaEff	Between Groups	2.405	10	.241	1.049	.403
	Within Groups	46.753	204	.229		
	Total	49.158	214			

AVESat	Between Groups	2.955	10	.295	1.095	.368
	Within Groups	55.065	204	.270		
	Total	58.019	214			

Figure 15. ANOVA- By Year GPA

		Sum of Squares	df	Mean Square	F	Sig.
AVEPrefer	Between Groups	1.445	5	.289	1.158	.331
	Within Groups	52.144	209	.249		
	Total	53.588	214			
AVEAdv	Between Groups	1.953	5	.391	1.606	.160
	Within Groups	50.814	209	.243		
	Total	52.767	214			
AVEComm	Between Groups	2.475	5	.495	1.409	.222
	Within Groups	73.433	209	.351		
	Total	75.908	214			
AVEFlex	Between Groups	2.582	5	.516	1.741	.127
	Within Groups	62.000	209	.297		
	Total	64.581	214			
AveChal2	Between Groups	1.376	5	.275	1.321	.256
	Within Groups	43.532	209	.208		
	Total	44.908	214			
AVEChaFE	Between Groups	2.215	5	.443	1.565	.171
	Within Groups	59.154	209	.283		
	Total	61.369	214			
AVEChaEff	Between Groups	1.704	5	.341	1.501	.191
	Within Groups	47.454	209	.227		
	Total	49.158	214			
AVESat	Between Groups	3.742	5	.748	2.882	.015
	Within Groups	54.277	209	.260		
	Total	58.019	214			

Figure 16. ANOVA- By Discipline of Study

		Sum of Squares	df	Mean Square	F	Sig.
AVEPrefer	Between Groups	.771	3	.257	1.027	.381
	Within Groups	52.817	211	.250		
	Total	53.588	214			
AVEAdv	Between Groups	2.353	3	.784	3.282	.022
	Within Groups	50.414	211	.239		
	Total	52.767	214			

AVEComm	Between Groups	2.443	3	.814	2.339	.075
	Within Groups	73.465	211	.348		
	Total	75.908	214			
AVEFlex	Between Groups	2.283	3	.761	2.577	.055
	Within Groups	62.298	211	.295		
	Total	64.581	214			
AveChal2	Between Groups	.099	3	.033	.155	.927
	Within Groups	44.810	211	.212		
	Total	44.908	214			
AVEChaFE	Between Groups	.416	3	.139	.481	.696
	Within Groups	60.952	211	.289		
	Total	61.369	214			
AVEChaEff	Between Groups	.180	3	.060	.259	.855
	Within Groups	48.978	211	.232		
	Total	49.158	214			
AVESat	Between Groups	2.050	3	.683	2.577	.055
	Within Groups	55.969	211	.265		
	Total	58.019	214			

Figure 17. ANOVA-By Percentage of Online Learning

		Sum of Squares	df	Mean Square	F	Sig.
AVEPrefer	Between Groups	.693	4	.173	.688	.601
	Within Groups	52.895	210	.252		
	Total	53.588	214			
AVEAdv	Between Groups	.803	4	.201	.811	.519
	Within Groups	51.964	210	.247		
	Total	52.767	214			
AVEComm	Between Groups	1.736	4	.434	1.229	.300
	Within Groups	74.172	210	.353		
	Total	75.908	214			
AVEFlex	Between Groups	1.047	4	.262	.865	.486
	Within Groups	63.534	210	.303		
	Total	64.581	214			
AveChal2	Between Groups	.919	4	.230	1.097	.359
	Within Groups	43.989	210	.209		
	Total	44.908	214			
AVEChaFE	Between Groups	1.626	4	.407	1.429	.225
	Within Groups	59.742	210	.284		
	Total	61.369	214			
AVEChaEff	Between Groups	.569	4	.142	.615	.653

	Within Groups	48.589	210	.231		
	Total	49.158	214			
AVESat	Between Groups	1.014	4	.254	.934	.445
	Within Groups	57.005	210	.271		
	Total	58.019	214			

Figure 18. ANOVA- By learning preference

		Sum of Squares	df	Mean Square	F	Sig.
AVEPrefer	Between Groups	1.173	5	.235	.935	.459
	Within Groups	52.415	209	.251		
	Total	53.588	214			
AVEAdv	Between Groups	.695	5	.139	.558	.732
	Within Groups	52.072	209	.249		
	Total	52.767	214			
AVEComm	Between Groups	2.262	5	.452	1.284	.272
	Within Groups	73.646	209	.352		
	Total	75.908	214			
AVEFlex	Between Groups	.891	5	.178	.585	.712
	Within Groups	63.690	209	.305		
	Total	64.581	214			
AveChal2	Between Groups	2.443	5	.489	2.405	.038
	Within Groups	42.465	209	.203		
	Total	44.908	214			
AVEChaFE	Between Groups	3.194	5	.639	2.295	.047
	Within Groups	58.175	209	.278		
	Total	61.369	214			
AVEChaEff	Between Groups	2.252	5	.450	2.007	.079
	Within Groups	46.907	209	.224		
	Total	49.158	214			
AVESat	Between Groups	.358	5	.072	.259	.935
	Within Groups	57.662	209	.276		
	Total	58.019	214			

Figures 12-18 showed that respondents' perceptions of the advantages and challenges of online learning, and their satisfaction in terms of interaction did not show significant differences between groups when grouping the results by year of study, year GPA, discipline of study, percentage of online learning and learning preference.

Reliability

Figure 19. Scale: ALL VARIABLES
Case Processing Summary

		N	%
Cases	Valid	215	100.0
	Excluded[a]	0	.0
	Total	215	100.0

a. Listwise deletion based on all variables in the procedure.

Figure 20. Reliability Statistics- Preference

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.776	.778	5

Figure 21. Reliability Statistics- Chance of interaction

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.845	.847	5

Figure 22. Reliability Statistics- Flexibility of communication tools

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.805	.806	5

Figure 23. Reliability Statistics- Feedback received

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.799	.799	5

Figure 24. Reliability Statistics- Effectiveness of interaction

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.702	.704	5

Figure 25. Reliability Statistics- Satisfaction

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.798	.796	5

Figure 26. Reliability Statistics- Advantages

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.861	.860	10

Figure 27. Reliability Statistics-Challenges

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.841	.842	10

Correlations

Figure 28. Correlations

		AVEPrefer	AVEAdv	AVEComm	AVEFlex	AveChal2	AVEChaFE	AVEChaEff	AVESat
AVEPrefer	Pearson Correlation	1	-.052	-.054	-.035	.367**	.351**	.309**	-.075
	Sig. (2-tailed)		.450	.432	.607	.000	.000	.000	.273
	N	215	215	215	215	215	215	215	215
AVEAdv	Pearson Correlation	-.052	1	.878**	.855**	-.300**	-.193**	-.359**	.562**
	Sig. (2-tailed)	.450		.000	.000	.000	.005	.000	.000
	N	215	215	215	215	215	215	215	215
AVEComm	Pearson Correlation	-.054	.878**	1	.504**	-.246**	-.129	-.326**	.520**
	Sig. (2-tailed)	.432	.000		.000	.000	.060	.000	.000
	N	215	215	215	215	215	215	215	215
AVEFlex	Pearson Correlation	-.035	.855**	.504**	1	-.276**	-.209**	-.295**	.452**
	Sig. (2-tailed)	.607	.000	.000		.000	.002	.000	.000
	N	215	215	215	215	215	215	215	215
AveChal2	Pearson Correlation	.367**	-.300**	-.246**	-.276**	1	.914**	.891**	-.252**
	Sig. (2-tailed)	.000	.000	.000	.000		.000	.000	.000
	N	215	215	215	215	215	215	215	215
AVEChaFE	Pearson Correlation	.351**	-.193**	-.129	-.209**	.914**	1	.629**	-.211**
	Sig. (2-tailed)	.000	.005	.060	.002	.000		.000	.002
	N	215	215	215	215	215	215	215	215
AVEChaEff	Pearson Correlation	.309**	-.359**	-.326**	-.295**	.891**	.629**	1	-.246**
	Sig. (2-tailed)	.000	.000	.000	.000	.000	.000		.000
	N	215	215	215	215	215	215	215	215
AVESat	Pearson Correlation	-.075	.562**	.520**	.452**	-.252**	-.211**	-.246**	1
	Sig. (2-tailed)	.273	.000	.000	.000	.000	.002	.000	
	N	215	215	215	215	215	215	215	215

**. Correlation is significant at the 0.01 level (2-tailed).

Figure 28 showed correlations between undergraduate students' preferences of interaction, perceptions of advantages and challenges of online learning, and how these affected their satisfaction.

The figure revealed that undergraduate students' preferences of interaction did not have significant correlation with perceptions of advantages of online learning. However, there was a positive correlation between their preferences and challenges (+0.367).

With regard to the correlation between perceptions of advantages and challenges, a negative correlation was shown (-0.300), with responses and feedback (-0.193) received a lower correction compared to the effectiveness of interaction (-0.359).

There was a strong positive correlation between perceptions of advantages of online learning and chance to communicate (+0.878), and flexibility of communication tools (+0.855), which were categorized as advantages of online learning. Besides, the correlation between challenges

and responses and feedback received (+0.914), and effectiveness of interaction (+0.891) was also strong.

Moreover, effects of advantages and challenges on undergraduate students' satisfaction of online learning had a positive correlation with advantages of online learning (+0.562). On the other hand, there was a negative correlation with challenges of online learning (-0.252).

4.2 Qualitative research

Students preferred more interaction in the class

7 out of 12 expressed that they like to have interaction as it would be less boring than one-way teachings. The rest would not resist having interaction as they pointed out that there was a need for them to have interaction to learn better.

Interviewees	*Example quotes*
Apple	'I think it depends on the subject. For example, if it is English lesson, I think we have to do group discussion. If it is mathematics or accounting, I think we do not need interaction.'
Patrick	Take my subject as an example, I don't know if I like interaction or dislike it. I think there is a need for doing so, or I am very used to have interaction. It is because my subject does not only require us to listen. We have a lot of interactions with classmates and professors. If you ask me if I like it, I will say I like it because of the need.
Rita	I like to have more interaction. I have double majors. One is English. We need to discuss different texts. Therefore, it is important to have interaction. I can listen to different ideas. Another major is German. We must have interaction. I need to have interaction in order to practice this language.
Mandy	I like it. It is boring to have one-way teachings.

Students perceived chance to communicate with other learners both an advantage and challenge of online learning

Some students found increasing chance to interact with others using the breakout room on the online learning platform. They were more eager to express and discuss ideas.

Interviewees	***Example quotes***
Apple	I think the participation was quite good that at least everyone would speak even though they didn't turn on the camera. … I think the duration of discussion was shorter during face-to-face lesson. It was more formal. … It seemed like doing online discussion was not that formal. We had more opinions to express. … We would use Cantonese to do the discussion… , but it was not so good to do so during face-to-face lesson… We would say less. … I think I had more chance to do discussions with classmates whom I didn't know because the professor assigned us to a breakout room randomly. …
Rita	There would be more students speak in the breakout room. They answered fewer questions during the lecture. … In the breakout room, there would be more discussions. …

However, more students complained about other learners who did not participate in the breakout room, which resulted in no chance to have interaction.

Interviewees	***Example quotes***
Apple	When we were put in a room, it was so often that no one spoke. … People stayed there and waited until time was up. … In face-to-face lessons, the teacher was there. When he passed by, you had to speak even though you didn't want to speak. …
Katy	…Really no one spoke, no one turned on their mic and camera. Even if the teacher came in and asked if anyone was in the room… There could really be no response at all.

At the same time, the universities restricted students to use the functions on the online platform. Students perceived it as a challenge which limited chance of interaction.

Interviewees	***Example quotes***
Man	The challenge was that I could not speak to my classmates. … I had little interaction with my classmates. … It restricted us to use the chat box to ask questions… We could not communicate. …

Limited and decreasing chance to interact with other learners was particularly severe when students had to learn practical skills and carry out projects.

Interviewees	*Example quotes*
Polly	When we had discussions, students would not turn on their mic. It was designed for us to speak and communicate. … It gradually became only for finishing the homework. We said hi and then quickly opened a Google Drive to type in the answers individually…. We were not doing communication. … I felt like discussions in face-to-face lessons were more formal. … We had more discussions in the past… not just did homework from the very beginning…. … In the past, everyone got a computer and we formed a circle. If I found some information, I would show my computer to my friends. We had obstacles talking about our findings. … It's hard to receive opinions… I felt like I lost the feeling of forming a circle… exchanging our resources… … If we didn't understand after watching the demonstration, we could remind each other. You could teach me. I would also teach you. There was a feeling of helping each other …

Tyler compared doing experiments during face-to-face and online lessons. When having online lessons, they watched videos instead of having hand-on experience in the laboratory.

Interviewees	*Example quotes*
Tom	If it was a face-to-face lesson, we had to do it by ourselves. I did it with my classmates. We had discussions to see how we could have a more accurate result, or how we could have a result with better quality. If we just watched videos, we just received results, there was no room for discussion. …

Students perceived chance to communicate with instructors a challenge of online learning

Interviewees	*Example quotes*
Ben	When the teacher kept speaking, it was difficult for you to interrupt his speech. Although there is a button on Zoom for you to raise your hand, the teacher could not see. If you wanted to grasp the chance, you have to use the chat box. …
Coco	

	Usually during face-to-face lesson, our class would give responses like 'Oh!' 'Yes'. Teachers sometimes would ask simple questions like 'Have your tried….' And we would say yes. There would be fewer these situations during online learning. …
Polly	When it was an on sight practical lesson, teachers would do demonstration. We could ask questions if we did not understand. … When we practiced the skills, teachers would come and observe, and pointed out our mistakes immediately… But during online learning, teachers could only share common mistakes students would make. …

Students perceived increasing flexibility of communication tools an advantage of online learning

Most undergraduates' students perceived the flexibility of using communication tools increased, which was an advantage of using online learning. They got different ways to interact with others such as the chat box and polling.

Interviewees	***Example quotes***
Coco	Having the chance to use chat box is an advantage of online learning. … I had a professor who liked to use polling. … It was a good way to lower the barriers of participation.
Hei	During face-to-face lesson, the method to interact is by answering questions. You have to speak up. When using online learning, teachers will ask us to vote on chat room or type in some answers. There are different ways of interaction.
Polly	Another advantage is that I appreciate the teacher had some polling sections or designed some multiple choice questions. For example, the questions asked us if we had finished the pre-readings… we could choose yes or no. … After finishing a chapter, there was a summary exercise for us. … This is an advantage of online learning. There are more ways to interact. … Teachers and students can have diversified ways of interaction.
So	I think there are more choices when using online learning. There are emotions, chat (room), Q&A. We can share screen. But when having face-to-face lesson, it is not that diverse. …

Students perceived increasing flexibility of communication tools increased chance of interaction in the class

Students shared similar feeling that using online platform to learn made them feel 'less pressured', 'more comfortable' and 'not afraid to answer questions wrongly'. Learning online allowed them to turn off their camera and used mic to ask or answer questions in the lesson, which increased chance of interaction.

Interviewees	***Example quotes***
Apple	I don't like sitting in the front row during face-to-face lessons because I feel pressured. Students sitting in the front would answer questions. … During online learning, I would answer questions as there is less pressure. Thus, there is more interaction. … It doesn't matter that I answered questions wrongly because I didn't turn on the camera.
Ben	When having face-to-face lessons, you will be under some pressure. You dare not to express some opinions. … You will be shy. … Online learning will be relatively simple …. You don't need to turn on the camera. You can just turn on the mic to express your thoughts. … I think you will be bolder to communicate. … This is the advantage. … Even you give a wrong answer, you don't know others' reactions so you will share. …
Polly	I feel more comfortable to ask questions. …
Tom	It would be more stressful to answer questions during face-to-face lessons… It would be easier to use Zoom. You can turn off the camera. … More than a hundred students would focus on you when you were answering questions. … But most of the time you used the chat box to answer. … no one would know who you are. … So it's less stressful. … I used the chat box to ask questions. I did not need to consider others' thoughts. … When it was face-to-face lessons, I needed to think about if others understood the questions. … I think I am not that abrupt. …
So	I felt more secure as others could not see me. The screen was black. … Even though I was not that sure if I gave the correct answer... I would be more brave to click the unmute button. …

<u>Some students perceived delay of receiving responses and feedback a challenge of online learning</u>

Interviewees	***Example quotes***
Coco	I remembered my professor did not answer my e-mail regarding my presentation outline. … There was another question using e-mail to ask

	questions, which was difficult to ask follow-up questions. … If there was some content that I didn't understand, he would not explain to me until I get it. …
Lily	The teacher would wait for several students' questions and then answered them at once. … When there was face-to-face lesson, of course he would answer the questions one by one when students raised questions. …

Most students perceived lacking effectiveness a challenge of online learning

Students perceived their teachers found difficulties to handle the communication tools on the online learning platform, which hindered the effectiveness of interaction in the class.

Interviewees	***Example quotes***
Coco	They found it hard to use technology. They didn't know how to share screen. … They didn't not want to spend time to fix the mic and the websites. … They had burden technologically. …
Lily	I think there was less interaction. … Some teachers didn't know how to take a look at the chat box. Some would not check the chat box.
Patrick	The professor was not very familiar with the platform. … At the beginning some professors even didn't know how to use the breakout room. They did not use it… and there would be no comments and interaction. …
Rita	… There was some chaos. Sometimes there was a breakout room. Sometimes there was no breakout room. … There was just little interaction. And sometimes there was some. … In English class, the teacher did not know how to use the share screen function. …

Also, students expressed that the teaching strategy of teachers changed. They tended to just read the PowerPoint and made videos for students to watch. Such one-way teaching strategy made students felt like 'watching a YouTube teaching clip.'

Interviewees	***Example quotes***
Coco	I had a professor who video-taped a two-hour video for us to watch during the lesson. It was just a PowerPoint with audio explanations. … I was just like watching a YouTube teaching clip. … I didn't not have a chance to speak. …

	There was a professor, I had experience of having face-to-face lesson with him. … He did not talk much and would only prepare a thirty-minute PowerPoint to teach. … The time left would be our discussion time. He always encouraged us to express our thoughts. … However, when he used Zoom to teach, he became a dictator. He prepared a three-hour PowerPoint and kept talking from 9am to noon. He didn't like students to ask questions. May be because he didn't want students' sound to overlap with him… There was a great difference that his lesson changed from very interactive to one-way teaching. … I think he thought that it was difficult to control Zoom. Thus, he did not allow us to talk. …
Patrick	… Social work programme required students to give responses. … However, apart from online learning, teachers would provide us teaching videos. I think it was just like watching a person reading the script. He would not ask me questions, and there was no communication. … I found more professors used such way to teach… They used to have more class activities. …

Other challenges perceived by students

Students also perceived lacking of nonverbal cues, feeling alone and having technical problems challenges of online learning , which hindered interaction.

Interviewees	***Example quotes***
Apple	I think network problem is a challenge. There was a time when teacher ask me questions, and my network got disconnected. The teacher did not want to stop the lesson and would ask other students to answer the question. I missed the chance to answer the question.
Ben	When talking in a face-to-face way, other people can look at you. There is eye contact, which facilitated interaction.
Coco	I was like working alone. For example, when taking course about politics, I felt strongly that the professor did not want to take care of me. I asked him question but he didn't answer me. Other learners also did not respond to me. …
Lily	I think university is the time to know more about the professors. Interaction is an important thing. I want to learn something more from my professors which is beyond the course. … If I study well, I could ask him to write reference letter for me… But you may just meet your professor once during the presentation when learning online. It will be difficult to have other connections as you don't build up relationship with them …

Patrick	I am a person who focuses more on feelings. I think the whole thing is very indifferent. I do not want to speak in front of the screen. … I used to meet many people and could see their facial expressions and gestures. … Online platform does not allow me to see that, or I call them nonverbal cues. …
Rita	There was a lot of technical difficulties. For example, some might be disconnected from the Internet. The mic of the instructor did not have sound. … It took some time to fix. …

Students perceived both satisfactory and dissatisfactory towards online learning

Interviewees	***Example quotes***
Ben	'I think it could be better. Overall, I think it is satisfactory.'
Coco	'…I will give zero mark…. I think it is not the fault of Zoom, it is more about how the professors arrange the lessons, and whether your classmates participate in the lesson. … '
Lily	'If 10 marks is full mark, I would only give 1 or 2 marks. … I think it is a regret of my university life. …'
Polly	'Take it as a substitution under the situation that face-to-face lesson could not be conducted, I am satisfied. '

More interviewees preferred face-to-face learning to online learning

Face-to-face learning was particularly preferred by those who had to learn practical skills. However, students accepted to have online learning in lectures.

Interviewees	***Example quotes***
Coco	If we need to do group project, I prefer face-to-face learning. From the perspective of interaction, I also think face-to-face mode is much better as the atmosphere is better. …
Hei	If it is a lecture, there is no big difference. If it is practical section or practicum, of course face-to-face learning is better.
Polly	If it is a lecture, whether it is taught online or not it is not so important. Lectures taught with face-to-face mode are not so important. … However,

	for sure I want tutorial and laboratory lessons to be learnt with face-to-face mode, including project tasks and consultation with teachers. … because the main problem is communication. …

Students also expressed how the four aspects namely chance of interaction, flexibility of communication tools, feedback received, effectiveness of interaction affected their level of satisfaction of online learning in terms of interaction.

Chance of interaction

Interviewees	*Example quotes*
Apple	I think there are quite many opportunities to interact as there are different tools.
Coco	The opportunity of interaction reduces the level of satisfaction of online learning because there are fewer interactions with my classmates.
Mandy	In terms of chance of interaction, as I got fewer communication with teachers and other learners. And chance of interaction contributed a large percentage of level of satisfaction. If there is more chance of interaction, I would be more satisfied.

Flexibility of communication tools

Interviewees	*Example quotes*
Hei	Although there are more communication tools, they are not as convenient and effective as face-to-face learning.
Mandy	We didn't use many communication tools, so my level of satisfaction is low.
Patrick	I think it has the least impact on my satisfaction. I focus more on quality. … And you talk about numbers. It is irrelevant. As long as there is a good tool, I think it is enough.

Effectiveness of interaction

Interviewees	*Example quotes*
Coco	

	I think face-to-face learning is more efficient, despite the fact that I could ask follow-up questions, professor could also see my facial expressions… The environment of Zoom makes interaction so one-way. There was verbal communication. There was just texts and voices…
Patrick	The subjects I studied need interactions. … Like atmosphere, if there is any barrier, if students joined the discussion, all these affected my learning. … which directly affected level of satisfaction of online learning
Polly	I think online learning is a bit worse. I think that in terms of real-time delivery of messages, synchronization is poorer. The level of satisfaction would be lower. …

Feedback received

Interviewees	***Example quotes***
Coco	There was less feedback received from online learning, which reduces the level of satisfaction of online learning. During group discussions, students did not speak. Even if they speak, there were only 3 out of 5 students would join the discussion. As a result, the content we could discuss was just little, not as much as the one we had during face-to-face lesson.
Hei	We just had verbal comments during online learning. Feedback from face-to-face lessons could be his demonstrations. Online learning lacked demonstrations. Thus, I am not that satisfied with online learning.

5. Discussion

Amended conceptual framework based on findings

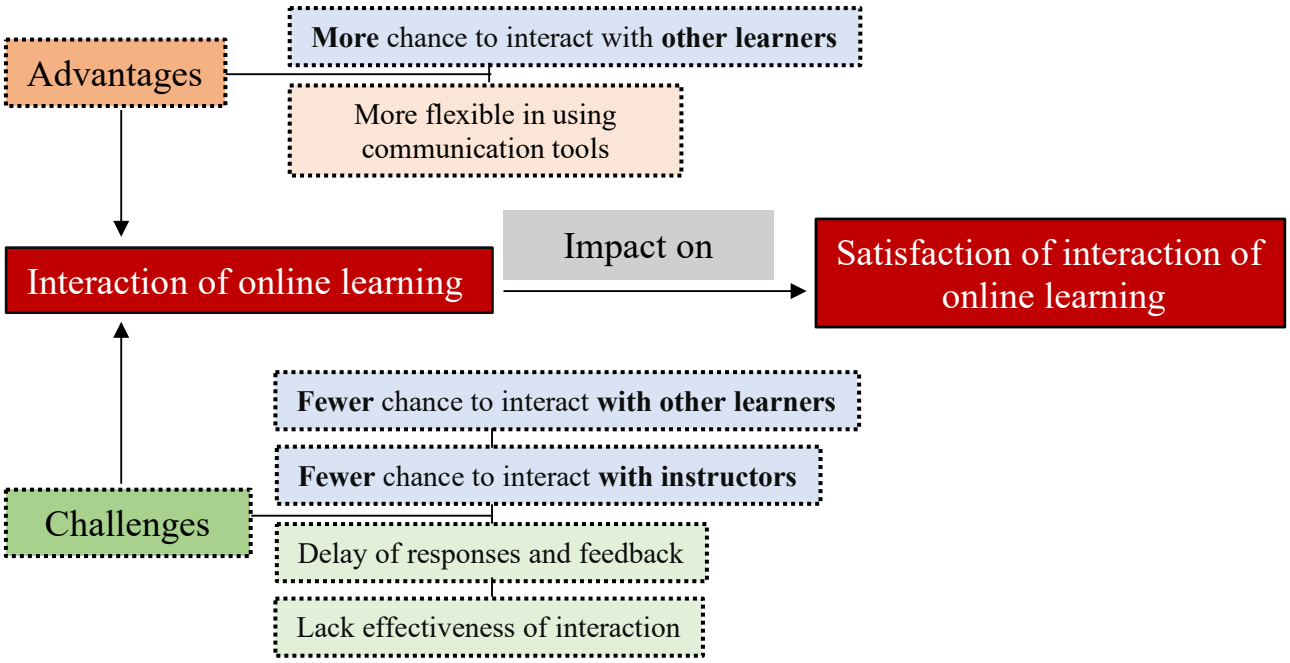

Figure b.

5.1 Students perceived increasing flexibility of communication tools an advantage of online learning

Undergraduate students perceived using different functions and tools such as the chat box, the breakout room and polling on the online platforms allowed them to express their thoughts not just by speaking up verbally, contributing to the result that they agreed the statements in the questionnaire. With more choices of tools, variety of ways of expressions increased. For example, they could write the answers on the chat box to interact with the professor.

Another significant advantage mentioned by many undergraduate students was the flexibility to turn off the camera. They perceived such an advantage as not letting others knew who they were reduced the pressure of being the focus of the crowd. They did not need to worry about giving wrong answers. Having more courage to click the unmute button, they could participate and interact more by answering questions.

5.2 Students perceived chance to communicate with other learners both an advantage and challenge of online learning

It was found that undergraduate students had diverse perceptions of whether online learning provided more chance to communicate with other learners. Simple conclusion could not be given that such an item was an advantage of online learning. Some undergraduate students perceived the breakout room provided a more favorable environment which was less formal for them to carry out discussions. They had the chance to choose a familiar language as the professor was not present.

However, students also perceived lacking participation of other learners as a challenge. It was found that the flexibility to turn on and off the mic and camera allowed students choose not to say anything during the discussions. Students who wanted to carry out discussions had no chance to interact with others as no responses were received. It was suggested that as the anonymity of each grouping, students had feeling of being safe of not to participate and tended to depend on others compare to face-to-face lessons (as cited in Trarnik, Urh & Jereb, 2019), hence interaction reduced.

Apart from that, the challenge became greater when doing projects and for the students who needed to learn through practice. They lost chance to be present to form ‘a circle’ to share information. They also perceived that opportunities to teach and discuss about the process reduced during online learning. Interactions with other leaners hence was hindered.

5.3 Students perceived chance to communicate with instructors a challenge of online learning

Moreover, when it came to the chance to interact with instructors, students perceived there were fewer interaction. They perceived tending not to interrupt teachers when they were speaking, lacking simple questions and quick responses and missing the chance to know individual mistakes pointed out by teachers during practice as challenges. Students from Ng’s (2007) study had similar perceptions that they expressed they did not feel very pleasant as they could only ask questions after waiting for the instructor from finishing his delivery of content. Dissatisfaction was shown, and such limitation reduced chance of interaction between student

and teacher. Besides, interaction with instructors was greatly reduced for students who needed to learn practical skills in the lessons. They lost chance to ask questions during online learning.

5.4 Some students perceived delay of receiving responses and feedback a challenge of online learning

Undergraduate students perceived receiving feedback from instructors a challenge of online learning. It was also found that they experienced not receiving any responses from the instructor after the lesson through e-mail, which was a part of learning. Unlike face-to-face teaching that teacher could immediately answer questions raised by students, students perceived that there was a delay as teacher gathered questions first and then answered them. In Ng's (2007) study, similar challenges were perceived. Students who used *iClass* perceived that they had to wait for having reply from the instructor, it caused a one-way communication. Also, in Xiong et al. (2020)'s survey which was conducted in Hong Kong, 31% of the 1227 undergraduate students also said that no timely feedback was one of the obstacles they faced, showing it was a common problem of online learning.

5.5 Most students perceived lacking effectiveness a challenge of online learning

Among the Hong Kong undergraduate students' who took part in Xiong et al. (2020)'s survey voted that 'in-class interactions (50%)' was a factor determining if the online lessons were effective. In this study, undergraduate students perceived two challenges related to instructors which reduced effectiveness of interaction of online learning. The first one was their unfamiliarly in using the communication tools on the online platforms like Zoom. For example, the professors found it hard to systematically use the breakout room and the chat box to let students to engage in systematic discussions. They had difficulty in managing share screen functions, mic and websites. These technological problems consumed time in lessons and negatively affected their teaching, which consequently affected interactions in the lessons. These perceptions supported the findings of Wang, Cowie and Jones's (2009) study. Taiwan students also expressed that the teachers sometimes had difficulties in entering information such as symbols and Chinese characters in the online platform.

Besides, another concerned challenge perceived was the change of teaching strategy of the instructors. It was suggested that teachers had a significant role to establish the tone in online lessons in terms of interaction (cited in Kim, Liu & Bonk, 2005). Therefore, the way teachers designed the lessons would affect the whole process of carrying out discussions.

However, in Hong Kong, the way of lesson design in online learning led to reduced chance of interaction between students and instructors in online classes. Students experienced similar situation that they were just like watching a video which instructors were reading scripts to explain content. Some also used the word 'dictator' to describe the instructor who changed his teaching strategy from actively encouraging discussions during face-to-face lesson to dislike students from speaking up in online learning. One of the reasons of imposing restrictions and eliminating class activities was to allow the instructor to better manage the class, which also reduced the possibility of being disturbed by technical problems. However, the ineffective teaching strategy of one-way delivery greatly limited interaction between the instructor and students.

5.6 Other challenges perceived by students

Apart from the challenges discussed above, the most common challenge mentioned by undergraduate students was related to technology such as disconnection of network. Students found missing the opportunity to give an answer in the online classes because of this. Technological problems were a significant challenge perceived by students as shown in many studies. In Ng's (2007) study, defects of the devices interrupted the online lessons even though the respondents had accumulated some experiences of using IT technology.

Many students also perceived not able to know facial expressions and body languages when interacting with others a challenge of online learning, which is known as 'nonverbal cues' described in the survey. They expressed having eye contact and seeing gestures facilitated communication as they could 'feel' others. It was often found that they were like speaking with the screen as some could only see black icons. The findings echoed with the study of Obeidat (2021), which students perceived there was missing interaction between learners and teachers, sign and body language were also found removed. Student-student conversation was also absent.

Besides, there was a feeling of working alone among students. They were disconnected with instructors and other learners, which was contributed by lacking interaction on the online learning platform. Such challenge was also indicated in Obeidat (2021)'s research. Students expressed that they had a feeling of being isolated. It was because they were taken lessons separately, which led to a declining interaction with other people.

5.7 Students perceived both satisfactory and dissatisfactory towards online learning

It was shown by the result of the questionnaire that undergraduate students' perceptions of advantages and challenges regarding interaction of online learning was correlated to satisfaction of interaction of online learning, which means that these advantages and challenges were affecting students' level of satisfaction of online learning from the perspective of interaction. Studies suggested that ample interaction between instructors and other learners contributed to higher level of satisfaction of online classes of the students (cited in Woods, 2002).

Also, there was a positive correlation between their preferences and challenges, which meant students who preferred having interaction in the class tended to agree the challenges faced during the online learning.

A negative correlation was also shown between advantages and challenges of online learning with regard to interaction, which meant students who agreed the items of advantages tended to disagree the items of challenges or vice versa.

Undergraduate students held diverse perceptions regarding level of satisfaction of online learning in terms of interaction. In Hong Kong, more students preferred face-to-face learning to online learning. Such perception was similar to Ng's (2007) study as students perceived that the accuracy of communication and quality of interaction were much better when learning online. Also, in Humphrey and Wiles's (2021) study, 11 out of 14 biology students from the United States reported that they would choose face-to-face learning instead of online learning. They pointed out they preferred 'that connection from an in-person meeting and [ability] to ask questions promptly.' However, in Fortune, Spielman and Pangelinan's (2011) study suggested

that among the 156 undergraduate students from the United States, there was no significant difference when asking them about their preference regarding face-to-face learning or online learning.

In this study, differences could be found between lectures and tutorials teaching practical skills in Hong Kong context. Undergraduate students expressed that they did not mind how lectures were conducted as they found it less important to their learning. But when it came to the practical section, laboratory section or project tasks, undergraduate students preferred to learn in a face-to-face way, which showed that nature of the subject affected students' learning experience and thus their level of satisfaction.

5.8 Chance of interaction

Undergraduate students perceived that there was fewer chance for them to interact with other learners and instructors. This challenge lowered level of satisfaction of online learning with regard to interaction. In Ng's (2007) study, students dissatisfied over the one-way communication. Students in Hong Kong also found teachers controlled the functions of the learning platform, showing these were some common challenges affecting students' level of satisfaction as they limited chance of interaction of the students. However, students who held an opposite view perceived that there were more tools provided during online learning, which contributed to more chance for them to interact with others.

5.9 Flexibility of communication tools

When asking how flexibility of communication tools affected students' satisfaction of online learning in terms of interaction, although students agreed an increasing number of communication tools, they did not perceive such as an advantage to interaction as compare to face-to-face learning. It was because the tools did not make interaction convenient and effective. Students also perceived that choices of tools were not the key, but quality did. At the same time, some students did not perceive more flexible to use the tools as an advantage of online learning. Therefore, it lowered the satisfaction level of online learning.

The result in the survey showed a positive correlation between flexibility of communication tools and level of satisfaction. However, from the interviews, it was found that students

perceived more flexible to use communication tools, but this did not increase level of satisfaction of online learning in terms of interaction.

5.10 Effectiveness of interaction

Students perceived a lack of effectiveness of interaction during online learning lowered level of satisfaction. It could be concluded that ineffectiveness of interaction was caused by not able to see nonverbal cues such as facial expressions. Texts and voices became the only media to transfer messages. As a result, one-way delivery became a common phenomenon found in the lessons, making interaction ineffective. It was suggested that compared to different communication tools such as e-mail and chat functions, teachers' instructional design had greater influence (Cited in Tallent-Runnels et al., 2006). Besides, students also perceived synchronization as a challenge, causing a delay.

5.11 Responses and Feedback received

Students perceived limited responses and feedback received from other learners lowering their level of satisfaction. Such challenge was due to the fact that the participation rate of students was low. Not many students were eager to engage in discussions, causing limited responses received. Apart from that, level of satisfaction reduced as there was less feedback from instructors compared to face-to-face learning. Students perceived a challenge of having demonstrations and practices during online learning. Therefore, feedback from instructors would only restrain to verbal comments but not face-to-face instruction and correction, which also contributed to the lower level of satisfaction in terms of interaction during online learning.

6. Limitations of the Study

6.1 Small sample size

Only a limited number of Hong Kong undergraduate students joined the study, giving a small sample size. Therefore, generalization cannot be adopted.

6.2 Other possible advantages and challenges are not listed in the questionnaire

Hong Kong undergraduate students' perceptions of the advantages and challenges with regard to interaction in online learning are listed by the researcher in the questionnaire based on previous studies. There might be other possible perceived advantages and challenges of interaction which are not included in the questionnaire that worth discussing. However, effects of this limitation were reduced by carrying out follow-up discussions.

6.3 Dominated by Zoom as the way of online learning

Under COVID-19, most undergraduate students from different Hong Kong universities used Zoom as the platform to attend lessons in 2019/2020 academic year. The results of online learning experience obtained from quantitative and qualitative methods were seen dominated by this learning experience and the usage of Zoom. Therefore, there was a limited discussion on other learning platforms and related online learning materials.

7. Conclusion and suggestions

In this study, Hong Kong undergraduate students' perceptions of advantages and challenges of online learning with regard to interaction was studied. It was found that most students perceived more flexible to use communication tools as an advantage of online learning. When talking about chance of interaction as an advantage of online learning, students had different perceptions in such item as some of them have limited opportunity to interact with other learners and instructors.

Majority of Hong Kong undergraduate students perceived delay of responses and feedback and lack of effectiveness of interaction as challenges of online learning. It was suggested that technical problems also negatively affected interaction during online lessons. Therefore, more training could be provided to both students and instructors so that smooth and quality lesson interaction could be conducted with the use of different communication tools such as the breakout room and the chat box to facilitate lesson interaction.

The study also supported that both advantages and challenges were correlated with students' level of satisfaction of online learning in terms of interaction. It was found that students

perceived more challenges than advantages when learning online. For example, the lack of responses from other learners and instructors and the one-way teaching approach. Thus, new teaching strategies could be designed to increase motivation of students to encourage them in participating in lesson activities.

Base on this study, further research could investigate other possible advantages and challenges of online learning such as effects of turning on or off the camera on students' learning outcomes, and the differences of learning experience between students who have or do not have practicum. This may contribute to a more favorable online learning environment for Hong Kong undergraduate students in the future.

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Appendix 1: Quantitative research: Questionnaire

Exploring Hong Kong undergraduate students' perceptions of online learning

I am a final year student of BEd (History) from EdUHK. The topic of my research is 'exploring Hong Kong undergraduate students' perceptions of online learning', which is supervised by Dr. Fok Ping Kwan.

This questionnaire consists of 5 parts. Please take around 5 minutes to complete. Your participation in this survey is voluntary with guaranteed anonymity. All data will be properly kept and strictly confidential. Thank you very much for your time.

If you have any enquiries, please contact Hui Pui Yee at s1120850@s.eduhk.hk

Section 1: Background

1. Gender:

Female
Male

2. University in 2019/2020:

BU
CityU
CUHK
EdUHK
HKU
HKUST
HSU
LingU
OU
PolyU
SYU

3. Year of study in 2019/2020:

Year 1
Year 2
Year 3
Year 4
Year 5
Year 6

4. Discipline in 2019/2020:

Business
Education

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Engineering
Humanities (e.g History, Literature)
Language/Linguistics
Medicine
Nursing
Sciences
Social Sciences
Other:

5. Year GPA in 2019/2020:
_____

6. Percentage you have on online learning (e.g. Zoom, discussion forum, video) among all courses you registered in 2019/2020:

0%-20%
21%-40%
41%-60%
61%-80%
81%-100%

Section 2: Learning preferences established according to your past experience

7. I prefer more interaction with my instructors in the class.

   Strong agree/ agree/ disagree/ strongly disagree

8. I prefer more interaction with other learners in the class.

   Strong agree/ agree/ disagree/ strongly disagree

9. I perceive interaction as important to facilitate my learning.

   Strong agree/ agree/ disagree/ strongly disagree

10. I often interact with my instructors in the class.

    Strong agree/ agree/ disagree/ strongly disagree

11. I often interact with other learners in the class.

    Strong agree/ agree/ disagree/ strongly disagree

Section 3: Perception of the advantages of online learning

I perceived

12. more opportunities to interact with my instructors

    Strong agree/ agree/ disagree/ strongly disagree

13. more opportunities to interact with other learners

    Strong agree/ agree/ disagree/ strongly disagree

14. more confident to ask questions

    Strong agree/ agree/ disagree/ strongly disagree

15. more confident to respond to questions

    Strong agree/ agree/ disagree/ strongly disagree

16. more chance to communicate

    Strong agree/ agree/ disagree/ strongly disagree

17. more ways (e.g. email, chat, bulletin boards) to interact with my instructors

    Strong agree/ agree/ disagree/ strongly disagree

18. more ways (e.g. email, chat, bulletin boards) to interact with other learners

    Strong agree/ agree/ disagree/ strongly disagree

19. convenience in using communication tools (e.g. at any time, place) to interact with my instructors

    Strong agree/ agree/ disagree/ strongly disagree

20. convenience in using communication tools (e.g. at any time, place) to interact with other learners

    Strong agree/ agree/ disagree/ strongly disagree

21. more flexible in using communication tools

    Strong agree/ agree/ disagree/ strongly disagree

Section 4: Perception of the challenges of online learning

I perceived

22. delay of immediate responses from my instructors

    Strong agree/ agree/ disagree/ strongly disagree

23. delay of immediate responses from other learners

    Strong agree/ agree/ disagree/ strongly disagree

24. insufficient feedback from my instructors

    Strong agree/ agree/ disagree/ strongly disagree

25. insufficient feedback from other learners

    Strong agree/ agree/ disagree/ strongly disagree

26. receiving feedback as a challenge

    Strong agree/ agree/ disagree/ strongly disagree

27. lacking nonverbal cues (e.g. eye contact, gestures, posture) in communication

    Strong agree/ agree/ disagree/ strongly disagree

28. being unfamiliar with learning partners

    Strong agree/ agree/ disagree/ strongly disagree

29. instructors lacking effective online communication skills

    Strong agree/ agree/ disagree/ strongly disagree

30. feeling of impersonal

    Strong agree/ agree/ disagree/ strongly disagree

31. lacking interaction as a challenge

    Strong agree/ agree/ disagree/ strongly disagree

Section 5: Satisfaction of online learning

I perceived satisfaction with

32. the opportunity of interaction

    Strong agree/ agree/ disagree/ strongly disagree

33. the flexibility of communication tools

    Strong agree/ agree/ disagree/ strongly disagree

34. the feedback received

    Strong agree/ agree/ disagree/ strongly disagree

35. the effectiveness of interaction
    Strong agree/ agree/ disagree/ strongly disagree

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36. online learning

Strong agree/ agree/ disagree/ strongly disagree

37. Would you be interested in attending a follow-up interview?
Yes/No

Surname: Mr/Ms/Miss_____

Email:

Contact number:

Thank you very much for your time!

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Appendix 2: Qualitative research: Interview Questions

1. What's your preference regarding interaction in the class?
2. Can you tell me about the situation of interaction with instructors and learners?
3. What do you think about interaction and learning?

   Please recall your online learning experiences of 1-2 course(s) of your major in 2019/2020 as example(s) to illustrate your answers in the following part.

- What's the course(s) about?
- What's it's mode of teaching?
  (mixed? purely online? lecture? tutorial?)
- Do you know your classmates? How many people were there?

4. What do you perceive the advantages of online learning regarding interaction?
5. What do you perceive the disadvantages of online learning regarding interaction?

6. How do you think about talking with instructors and other learners online?
7. What communication tools have you used in online learning? How do you use them? How do you think about them?

8. Can you tell me more about the situation of receiving feedback from your instructors and other learners?
9. How's your relationship with your instructors and other learners when learning online? Can you talk to us about your sense of connections? What are the factors affecting the relationship?

10. Which mode of learning, face-to-face or online learning, do you like more? Why?
11. Are you satisfied with online learning? Can you explain your thoughts in terms of interaction?
12. What would you like to change in online learning regarding interaction?