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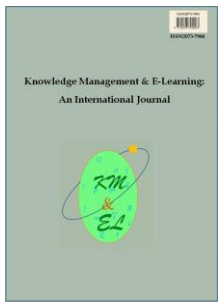

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Online learning during a global pandemic: Perceived benefits and issues in higher education

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Abstract: The COVID-19 pandemic has created substantial challenges across higher education, requiring academic institutes to conduct all teaching, learning, and assessments remotely online. To obtain a stronger understanding of the opinions of teachers and students in Hong Kong during this period, an anonymous online survey was distributed to all teachers and students at a higher education institute. Overall, 48 teachers and 425 students responded to the survey. This paper specifically analyzes the responses to open-ended questions from the survey to identify key topics and concepts. Open coding was used to obtain key terms, which were further grouped into categories. Results indicated that higher education teachers and students had similar issues (e.g., access to digital devices and software) and benefits (e.g., flexible scheduling and time arrangements) regarding online education. However, some categories were reported as both issues and benefits by teachers and students (e.g., communication/interaction), demonstrating that individual circumstances, abilities, preferences, and experiences, may influence satisfaction levels. Furthermore, results indicated that the delivery of quality online education enforced during a pandemic requires a multi-factorial and tailored approach. The information presented in this study will help higher education institutes to develop, redefine, and re-conceptualize online learning initiatives.

Keywords: e-Learning; Online course; Course satisfaction; Learning quality; Teaching quality; Distanced learning

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1. Introduction

The World Health Organization declared COVID-19 a public health emergency in January 2020 and a pandemic in March 2020 (Cucinotta & Vanelli, 2020). In Hong Kong stringent measures were taken, including border control, case finding and tracing, quarantining, and social distancing (Lai et al., 2020). As cases continued to rise, additional precautions were taken, and education institutions were temporarily closed in February 2020 (Press Releases, 2020), meaning no face-to-face classes, practical lessons, or facility usage. Therefore, all teaching and learning moved online, to enable continued education (Crawford et al., 2020).

Online and blended education is widely utilized in higher education, with a continued trend of programs transitioning to this mode from traditional face-to-face classes (Smith, 2010; Dziuban et al., 2018). Irrespective of the delivery method, research suggests similar teaching and student performance, emotional stability and satisfaction can be achieved (Ghaderizefreh & Hoover, 2018; Paul & Jefferson, 2019). However, the development of comprehensive and well-designed online teaching, learning, and assessment materials takes considerable time. Furthermore, suitable information technology (IT) infrastructures are essential, to ensure unhindered service and support for teachers and students while conducting online education (Holt & Thompson, 1998; Ayebi-Arthur, 2017). However, due to COVID-19 immediate decisions were required, and higher education programs quickly shifted online, which caused various issues for teachers (Asghar et al., 2021), particularly those with limited experience or knowledge of online teaching (Crawford et al., 2020). Additionally, reports in some countries (i.e., Pakistan) demonstrated difficulties in developing IT infrastructures quick enough to deal with the increased demand, leading to even less time for teachers to adapt and transition to an online teaching environment (Kaur, 2020).

Even if education institutes and teachers can quickly adopt online education, from a student's perspective numerous other barriers can negatively impact their learning experiences. For example, having access to a reliable internet connection and digital

device, or possessing the skills to work independently online (e.g., problem-solving, critical thinking) (Dhawan, 2020; Hu et al., 2021). Furthermore, some students require additional support for personal, social, and emotional issues that may be difficult to obtain in an online environment (Ghaderizefreh & Hoover, 2018). Therefore, beyond providing online learning content the role of education institutes, teachers, and support staff (e.g., IT technicians, student councilors) is multifaceted, requiring a concerted effort to provide students with high-quality service and support.

Specifically in Hong Kong, students from low-income households may be disadvantaged when conducting online learning, with only 37% possessing a computer versus 75% across all households, and 21% having no reliable internet access (as of 2015) (Ng et al., 2020). However, during COVID-19 adopting online education was deemed the most viable option, which also presented the additional issue of rapidly adopting new technologies (e.g., Microsoft Teams, Zoom). This may have inadvertently amplified the gap between students of low and high-income households for digital access, digital literacy, and academic performance (Reichert et al., 2020). Furthermore, deviated from the reported preferences of Hong Kong teachers to gradually implement new learning technologies into online education, as opposed to immediate innovation (Ng et al., 2020).

To combat inequality with online learning and promote student engagement, the Hong Kong government initiated a financial subsidy scheme for students to obtain mobile devices, internet access, and training (Legislative Council, 2017). Furthermore, all schools in Hong Kong were equipped with Wi-Fi and a "Bring Your Own Device" to school policy was introduced, to promote teachers and students to engage with mobile devices and online learning (Education Bureau, 2019). Within Hong Kong primary and secondary schools data was collected between 2011-2014, that demonstrated if suitable IT infrastructures and pedagogical designs are in place, online education is effective and enables students to meet learning outcomes (Education Bureau, 2015). Furthermore, this data also showed online learning supported students to develop information literacy, independent learning, critical thinking skills, and peer collaboration across all subjects (Education Bureau, 2015). Whereas, teachers who believed traditional teacher-centered education was best, adopted more student-centered practices while engaging with online teaching (Education Bureau, 2015).

In higher education, the Chinese University of Hong Kong reported that 99% of 1438 surveyed students had home access to a computer, mobile phone, and internet (Lam et al., 2011). Furthermore, these students regularly used digital communication strategies (e.g., email, forums), and possessed high digital literacy confidence (Lam et al., 2011). With this generation of students being termed 'digital natives', it is unsurprising that 90% felt online education strategies were beneficial. Whereas referring back to digital inequality, it was those students with greater use and access to technology and mobile devices, were most positive regarding the potential benefits of online learning (Lam et al., 2011).

Although some studies have addressed the online education experiences in Hong Kong, there is a need for greater insight into the positive and negative effects that COVID-19 has had. Therefore, this study aims to identify the perceived issues and benefits of teachers and students at a higher education institute in Hong Kong during COVID-19. This will provide valuable information for the development of future support and strategies required to facilitate high-quality online education in higher education.

2. Methods

2.1. Research setting

Due to the COVID-19 pandemic education institutes in Hong Kong were temporarily closed as of February 2020, and online education was adopted to ensure the safety of staff and students. To investigate the efficacy of online education during this period an institutional research project group was formed, including representatives from the research office, learning commons, and different faculties. An online survey was designed and distributed to obtain the experiences and opinions of teachers and students between April to June 2020. The results provide information to make informed decisions on the continued improvement of online learning strategies.

2.2. Instrument and data collection

An anonymous online survey was adapted from the DIY Survey Kit from EDUCAUSE (2020). The survey was created using Microsoft Forms in Office 365 and underwent numerous rounds of pilot testing to ensure the wording and structure were appropriate for the surveyed populations. An email with a hyperlink to the survey was sent to all teachers and students at the higher education institute. The data collection period is presented in Table 1. All responses were collated and converted into a Microsoft Excel workbook and prepared for further analysis. This paper specifically reports the qualitative findings from the open-ended questions. Participants were required to freely answer the following questions.

> **Students**: *"List and explain the biggest problems related to online learning during the COVID-19 pandemic*" and *"List and explain the most important benefits related to online learning during the COVID-19 pandemic*."
>
> **Teachers**: "*What additional support does the institute need to provide to resolve your problems related to online teaching during the COVID-19 pandemic*" and *"List and explain the most important benefits related to online teaching during the COVID-19 pandemic*."

Table 1
Data collection

	Student Online Survey	Teacher Online Survey
Posted online	29 April 2020	12 May 2020
Due by	10 June 2020	17 June 2020

2.3. Participants

In total 425 students constituting 13.2% of the institute's students, and 48 teachers constituting 33.6% of the institute's academic staff, completed the survey. Participant's demographic information is presented in Tables 2 and 3.

2.4. Data analysis

Open-ended responses were analyzed inductively using NVivo 12.0 to identify key topics and concepts in line with qualitative textual and content analysis procedures (Neuman, 2006; Jackson & Bazeley, 2019). The analysis-produced word clouds (see Fig 1-4) and lists (see Tables 4a-4d) showing the most frequently occurring terms, concepts, and phrases. Open coding was used to identify key terms, which were grouped into categories, deriving from inductive and deductive analysis (Glaser & Strauss, 1967; Glaser, 1978; Braun & Clarke, 2006).

3. Findings

3.1. Descriptive analysis of the respondents

Table 2
Demographics of student respondents

Description	Frequency (%)
Gender	• Male: 207 (48.7%) • Female: 218 (51.3%)
Mode of study	• FT: 41.3 (97.2%) • PT: 12 (2.8%)
Year of study	• Year 1: 60 (14.1%) • Year 2: 74 (17.4%) • Year 3: 175 (41.2%) • Year 4: 112 (26.4%) • Other: 4 (0.9%)
Faculty	• Design & Environment: 88 (20.7%) • Management & Hospitality: 127 (29.9%) • Science & Technology: 202 (47.3%) • Others: 8 (1.9%)
Do you have access to reliable Wi-Fi at home?	• Yes: 386 (90.8%) • No: 39 (9.2%)
Do you have a reliable desktop/laptop computer at home?	• Yes: 389 (91.5%) • No: 36 (8.5%)
Is it solely for your use? (follow-up question, with 387 responses)	• Yes: 311 (79.9%) • No: 76 (19.5%) • Not answered: 2 (0.5%)
For learning online at home, which of these devices do you use:	Most used device (1st): 1. Desktop/Laptop computer: 283 2. Mobile phone: 95 3. Tablet: 44 Second most used device (2nd): 1. Mobile phone: 144 2. Tablet: 64 3. Desktop/Laptop computer: 62

	Third most used device (3rd): 1. Tablet: 54 2. Mobile phone: 43 3. Desktop/Laptop computer: 19
How would you rate your digital knowledge and skills? (e.g., Your ability to learn and use software independently)	*M*(*SD*): 6.36/10 (2.714)

Table 3
Demographics of teacher respondents

Description	Frequency (%)
Gender	• Male: 29 (60.4%) • Female: 19 (30.6%)
Mode of teaching	• FT: 44 (91.7%) • PT: 4 (8.3%)
Years of higher education teaching experience	• M(*SD*) = 8.79 (6.046) • Range = 1 – 30
Faculty	• Design & Environment: 10 (20.8%) • Management & Hospitality: 22 (45.8%) • Science & Technology: 11 (22.9%) • Others: 5 (10.4%)
Do you have access to reliable Wi-Fi at home?	• Yes: 47 (97.9%) • No: 1 (2.1%)
Do you have a reliable desktop/laptop computer and equipment at home (e.g., microphone, webcam)?	• Yes: 45 (93.8%) • No: 3 (6.3%)
Is it solely for your use? (follow-up question, with 45 responses)	• Yes: 35 (72.9%) • No: 10 (20.8%) • Not answered: 3 (6.3%)
For teaching online at home, which of these devices do you use:	Most used device (1st): 4. Desktop/Laptop computer: 31 5. Mobile phone: 12 6. Tablet: 5 Second most used device (2nd): 4. Desktop/Laptop computer: 13 5. Tablet: 9 6. Mobile phone: 8
"How would you rate your digital knowledge and skills? (e.g., Your ability to teach with and use software independently)	*M*(*SD*): 7.44 (1.675)

3.2. Instrument development: Keywords and themes

3.2.1. Step 1

NVivo 12.0 was used to run a word frequency query with stemmed words to generate a word count list and word cloud. The query results listed the frequency of each word from highest to lowest.

The most frequently appearing words for students problems included: *online* (*f* = 52), *student(s)* (*f* = 41), *teacher(s)* (*f* = 39), *lecture(r)(s)* (*f* = 36), *learn/learning* (*f* = 35), *lesson(s)* (*f* = 35), *time/timely/timing* (*f* = 31), and *video* (*f* = 31). The most frequently appearing words for students benefits included: *time(s)* (*f* = 115), *flexible/flexibility* (*f* = 30), *video(s)* (*f* = 28), *learn/learning* (*f* = 24), *lecture(r)(s)* (*f* = 24), *save(s)(d)/saving* (*f* = 24), and *transport/transporting/transportation* (*f* = 22).

The most frequently appearing words for teachers support included: *online* (*f* = 14), *teaching* (*f* = 12), *student(s)* (*f* = 11), *support/supported/supporting* (*f* = 10), and *time(s)/timely* (*f* = 7). The most frequently appearing words for teachers benefits included: *student(s)* (*f* = 16), *online* (*f* = 13), *teaching* (*f* = 13), *learning* (*f* = 12), *use(d)* (*f* = 8), *face* (*f* = 6), *time* (*f* = 6), and *flexibility* (*f* = 5). The keywords frequency is presented graphically as a word cloud in Fig 1-4.

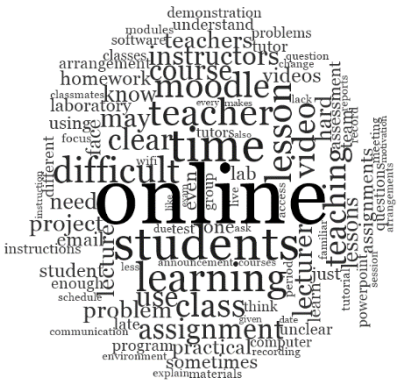

Fig. 1. Word cloud generated for "Student – Problems"

Fig. 2. Word cloud generated for "Student – Benefits"

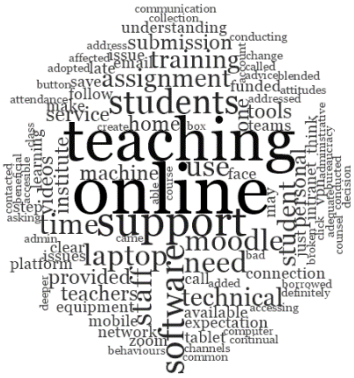

Fig. 3. Word cloud generated for "Teacher– Support"

Fig. 4. Word cloud generated for "Teacher– Benefit"

3.2.2. Step 2

The lists were reviewed to remove generic, irrelevant, or meaningless words (e.g., *use, may, even*). Other words related to understanding the problems, benefits, and required support associated with online learning were highlighted and analyzed. The agreement of terms and inter-rater reliability between two authors (WA and MWWK) who are experienced teachers in higher education was 80%, which is deemed acceptable (Neuendorf, 2002).

3.2.3. Step 3

Numerous themes emerged from the relevant keywords, referring to different aspects of online learning. However, some keywords were ambiguous within the matched themes. For example, "*class*" referred to the structure of a class but also the schedule of online classes. The multiple interpretations of such keywords required authors to read open-ended responses individually to determine the precise meanings.

3.2.4. Step 4

Using the keywords from the query, responses were reviewed again, and a few additional keywords were identified. For example, "*team"* may refer to student group work but also Microsoft Teams that teachers used to deliver online lessons. These phrases were entered again into the frequency query, to examine and identify additional important concepts.

3.2.5. Step 5

The identified keywords were then categorized into main themes for each open-ended question (see Tables 4a – 4d) and summarized using exemplar responses. The final step involved analyzing associated studies, to summarize and evidence the explanations of online learning for this study.

Table 4a
Frequency (*f*) table of keywords under the main themes for student problems

Schedule/Time	Mode of Learning	Access	Teacher/ Instructor	Communication/ Interaction	Student Difficulties	Assessment
Time (29)	Online (52)	Moodle (21)	Teacher(s) (37)	Question(s) (15)	Student(s) (41)	Assignment(s) (28)
Arrangement(s) (15)	Lesson(s) (35)	Software(s) (13)	Teaching (19)	Email (11)	Difficult (22)	Unclear (27)
Late (9)	Video(s) (31)	Team (10)	Tutor(s) (17)	Understand (9)	Problem(s) (22)	Project (14)
Period (7)	Lab/Laboratory (21)	Computer (8)	Instructors (16)	Group (8)	Hard (13)	Homework (11)
Schedule (6)	Lecture (14)	PowerPoint (8)	Lecturer (16)	Meeting (7)	Need (13)	Assessment (10)
Session (6)	Face (12)	Access (7)	Familiar (6)	Announcement (6)	Focus (7)	Test (8)
Date (5)	Practical (12)	Wi-Fi (7)		Ask (6)	Motivation (5)	Reports (6)
Set (5)	Demonstration (8)	Upload (5)		Classmates (6)		Exam (5)
Sometime (5)	Instruction(s) (13)			Communication (6)		
	Record (7)			Explain (6)		
	Live (7)			Environment (6)		
	Tutorial (7)					
	Recording (6)					

Note. Keywords with a frequency lower than 5 are not included.

Table 4b
Frequency (*f*) table of keywords under the main themes for student benefits

Schedule/Time	Travel	Mode of Learning/ Communication	Learning/ Assessment	Review Lesson Videos
Time(s) (115)	Transportation (19)	Class (13)	Learn/Learning (24)	Video(s) (28)
Flexible (27)	School (9)	Online (13)	Lecture (12)	Review (16)
Save (17)	Travel/Travelling (11) Campus (5)	Lesson(s) (12)	Assignments (7)	Recorded (13)
Reduce (8)	Cost (5)	Study (8)	Detailed (5)	Watch (10)
Free (7)		Lectures (7)	Teachers (5)	Understand (7)
Schedule (6)		Home (7)		Replay (6)
Anytime (5)		Face (5)		Listen (6)
Attend (5)				Repeat (5)
				Moodle (5)

Note. Keywords with a frequency lower than 5 are not included.

3.3. Students online learning problems

3.3.1. Schedule/Time

Students reported issues regarding the distribution of learning materials and lesson schedules: *"the time of updating teaching materials was not regular, which affected my schedule", "the adjusted course had differences with the original schedule", "notice about the new schedule was late"* and *"lesson arrangements were unclear and announced late."*.

Whereas, when online learning was delayed this caused congested schedules and incomplete lesson delivery: "*most lab sections were scheduled at the end of April and start of May, requiring us to finish multiple lab reports at once, which is inappropriate.*

Especially when I didn't have a full understanding of the labs", "the teacher was unable to conduct online-teaching for about 6-7 weeks. This made the class arrangement tight, with 13 lessons squeezed into 4–5. This was frustrating and difficult to follow" and *"the teaching schedule said on Mondays we had 9-10 tutorials. However, by the end of the semester, no tutorial sessions were provided by the lecturer."*

Table 4c
Frequency (*f*) table of keywords under the main themes for teachers support

Access	**Mode of Teaching**	**Communication/Interaction**	**Personal Difficulties**	**Student Assessment**
Software (6)	Online (14)	Student(s) (10)	Support (8)	Assignment (4)
Laptop (5)	Teaching (12)	Staff (5)	Need (5)	Submission (3)
Moodle (5)	Home (3)	Teachers (3)	Time (5)	Late (2)
Technical (4)	Face (2)	Videos (3)	Use (5)	
Institute (3)	Learning (2)	Available (2)	Training (4)	
Machine (3)	Mobile (2)	Call (2)	Issue(s) (4)	
Service (3)	Platform (2)	Clear (2)	Personal (3)	
Tools (3)		Email (2)	Provided (3)	
Connection (2)		Understanding (2)	Follow (2)	
Equipment (2)		Expectation (2)		
Intranet (2)				
Network (2)				
Tablet (2)				
Teams (2)				
Virtual Proxy Network (VPN) (2)				
Zoom (2)				

Note. Keywords with a frequency lower than 2 are not included.

Table 4d
Frequency (*f*) table of keywords under the main themes for teachers benefits

Schedule/Time	**Mode of Teaching**	**Teaching Materials/ Lessons**	**Communication/ Interaction**	**Student Learning/ Assessment**
Time (6)	Online (13)	Teaching (13)	Class (4)	Learning (10)
Flexible/Flexibility (5)	Face (6)	Lesson(s) (4)	Interaction (3)	Assignments (2)
Semester (3)	Future (4)	Materials (3)	Answer (2)	Homework (2)
Working (2)	Blended (3)	Prepare (3)	Chat (2)	Moodle (2)
	Familiar (3)		Environment (2)	
	Teams (3)		Night (2)	
	Distance (2)		Quiet (2)	
	Home (2)		Support (2)	
	Mode (2)			
	Technology (2)			
	Traditional (2)			
	Trend (2)			

Note. Keywords with a frequency lower than 2 are not included.

3.3.2. Mode of learning

Teachers used various methods to deliver online classes, which had varying levels of efficacy: *"my teacher just recorded 30 minutes for each lecture, while just reading the lecture notes without any explanation. This made us confused", "all lab sections had no videos to show how experiments were done, only PowerPoints. This was terrible for students understanding", "some teachers didn't provide access to the recordings of online classes. Which made it difficult to learn everything, as sometimes there was a bad connection"* and *"the effectiveness of online learning was lower than face-to-face lessons and consultation."*

3.3.3. Access

Digital inequality led to some students having issues accessing the required hardware to undertake online lessons: *"I had no stable Wi-Fi connection or computer for the first few months of online learning. Until my parents bought me a computer and an effective router, to reach the requirements of reviewing online videos."*

Software problems also prevented students from obtaining an efficient online learning experience: *"I could not find Microsoft Teams meeting links for online lessons*" and *"when teachers upload or remove teaching and assessment materials on Moodle, no automated email updates are sent to students."*

As teachers used various software for teaching and delivery purposes, students found it difficult to keep abreast of this: *"sometimes we were required to learn with software we have never used before", "different tutors used different software, it's difficult to learn and easy to mix up"* and *"teachers used various software for lessons, such as YouTube live and Microsoft Teams. It will be better if all modules used the same platform to avoid students having to search for study materials."*

3.3.4. Teacher/Instructor

The delivery and competency of online teaching by some teachers failed to meet the expectations of students: *"some instructors were unfamiliar with using online tools such as Microsoft Teams"* and *"the effectiveness of online teaching depends on the teacher's teaching style."*

The clarity of speech for some teachers led to students finding it difficult to accurately understand what was being said: *"sometimes it was hard to hear clearly what the tutor said in the lecture"* and *"tutors' English pronunciation in subtitled PowerPoints was incorrect."*

Other issues orientated around the lack of support and effort from teachers: *"certain teachers were not responsive or available"* and *"teachers didn't even open up online lessons."*

3.3.5. Communication/Interaction

Some students had difficulties to quickly and effectively communicate with teachers when conducting online lessons: *"I was not face-to-face with teachers to ask questions", "I could not ask questions immediately during the lecture", "during face-to-face classes I get an instant response, but when using email, responses came slowly"* and *"tutors didn't even reply to my emails nor empathize with the situation we're facing."*

Students reported a lack of contact from teachers regarding module updates: *"teachers did not send email updates when course materials are updated."*

On occasions teachers ineffectively communicated with students causing clarity issues and confusion: *"sometimes I did not fully understand the requirements", "the study plan was not clear and hard to understand", "I had communication problems, regarding which platform was being used to contact students and make announcements*" and *"I was told by one teacher that I didn't read their announcement, but I honestly spent the time to find updated posts."*

3.3.6. Student difficulties

Some issues experienced by students were personal: *"I could not focus at home as it's not like studying at school, there are other things I have to do", "It was difficult for teachers to motivate students to actively participate in class", "I had a lack of creative inspiration, motivation, direction", "I had a lack of motivation because of not seeing my classmates and teachers", "I could not focus on learning and it was hard to learn everything by myself"* and *"compared to classmates, I needed more time to learn skills in different software programs required for my modules. Online learning made me feel under pressure."*

Other issues were related to teacher-student interaction and online lesson content: *"students' reactions were easily neglected by tutors when online"* and *"calculation study was hard to understand online."*

3.3.7. Assessments

Some assessments had to be adapted to become online friendly, but students had issues with unclear guidelines or lack of consultation: *"the tutor canceled the labs and changed lab reports into a 3000-word essay, without discussing with students, and provided few instructions and guidelines", "each assignment, test, project, and exam should have had clear guidelines, to show students what to do", "guidelines of assignments and exams were unclear"* and *"we didn't know how to use some software and only had fundamental skills, but had to use if for our assignment."*

Conversely, some teachers kept original assessment items that were not appropriate to be conducted online: *"group projects continued, and it was difficult to discuss with other students regarding our work."*

With some delayed delivery of online lessons and the required changes to module schedules and assessments, students experienced occasional issues of congested assessment periods: *"some assignment deadlines, required us to hand work in on public holidays and I experienced 3 deadlines in one day, students don't have enough time to finish them"* and *"assignment arrangements were too tight and late."*

3.4. Students online learning benefits

3.4.1. Schedule/Time

A benefit for students being taught online was the flexibility to learn anytime and anywhere, which led to improved punctuality: *"I could study anytime online", "I could*

revise and learn when I wanted at home", "I had better time management", and *"I improved my late problem and was always on time for lessons."*

With additional flexibility provided for students learning schedules, students expressed more free time: *"I had more time to myself as I don't have to go to school"* and *"had more time to spend at home."*

3.4.2. Travel/Transportation

Students benefitted from saving time and money, through not having to travel to campus: "*a round trip from home to campus can take up to 3.5 hours, not having to travel saves a lot of time", "reduced travel costs, as I normally pay $40HKD to campus"* and *"saved a lot of money over this period."*

With the reduced burden of travel, some students experienced increased energy and attention while learning: *"commuting makes me exhausted, therefore it's hard to concentrate in class. But online learning saved commuting time, and I could pay more attention."*

Students appreciated the precautions taken by the institute to reduce travel, and reduce the likelihood of spreading or contracting COVID-19: *"no traveling greatly decreased the risk of getting infected on our way to campus"* and *"online learning allowed us to avoid traveling to school, as transportation is quite dangerous during this period."*

3.4.3. Mode of learning

In some modules, students reported improved interaction and communication with teachers compared to face-to-face classes: *"we had more communication with teachers compared to normal class", "lecturers made a great effort in responding to students questions"* and *"if we had questions, teachers helped us in an instant, giving detailed information and explanations on certain topics."*

Students appreciated teachers efforts in providing high quality online learning materials and lessons: *"some instructors made a great effort to provide live lessons", "I am appreciative and thankful for teachers doing their best to teach lectures and tutorials online"* and *"lectures or tutorials were provided with clear and detailed explanations on different topics and knowledge points."*

Some students valued the online learning experience: *"I was able to experience distant learning"* and *"I learned how to use different applications, Zoom, Skype, and Microsoft Teams."*

3.4.4. Learning/Assessment

Students were complementary of teachers who provided clear learning and assessment materials that supported their understanding, learning, and academic performance: *"my modules had detailed explanations on the assignments and lectures"* and *"explanations of the assignments in my module was detailed and facilitated my learning."*

With greater time availability and flexibility, students were able to spend more time working on assessments: *"I had more time to undertake assignments"* and *"more flexible time to complete assignments."*

3.4.5. Review lesson videos

A benefit reported by students was they could review recorded lessons placed online by teachers: "*videos were recorded so I can revise anywhere and anytime", "It was important for instructors to upload the lecture videos on Moodle so that I could watch it", "I could watch the lesson if I missed it, so I can understand the subject", "students could watch the videos at any time for revision"* and *"as the lecturer put the recorded PowerPoints on Moodle, we could listen to it when we were confused with specific parts."*

3.5. Teachers online support

3.5.1. Access

Staff was concerned regarding the lack of hardware available to conduct online learning: *"the institute should provide mobile devices and laptops for staff", "providing a laptop or computer would help"* and *"I do not have the required equipment and have to make do with an outdated laptop and mobile phone."*

Other issues orientated around access to different software: *"I need access to a Zoom account"* and *"software licenses need to be available for staff, on more than one device."*

Staff was provided with a virtual proxy network (VPN) to access intra-institutional electronic resources, but there were difficulties using this: *"the VPN was not working on my home internet connection."*

With accessibility issues, staff suggested that additional support was needed from IT technicians: *"technical support is required for network and connection issues", "more technical support for producing online teaching materials"* and *"instant support is needed when I'm online teaching."*

3.5.2. Mode of teaching

Teachers reported the quality of online learning should be improved to meet students' expectations: *"the institute may need to have a strategy to relieve students' disappointment before pushing or promoting online or blended learning"* and *"students have the common expectation when paying tuition fees that we should have face-to-face services, to make it worth the paid money."*

3.5.3. Communication/Interaction

Teachers suggested that a greater understanding of students expectations regarding online learning was required: *"understanding students' online learning attitudes and behaviors are important*" and *"I think conducting a survey will create a deeper understanding of the student and staff expectations, thereafter, it would be beneficial for this to be addressed through staff training."*

The quality of communication between students and support staff was also a concern: *"students were having difficulties, so they emailed and called technical support, but didn't understand their response, so I had to send emails on behalf of the student."*

3.5.4. Teacher difficulties

Different issues were reported by teachers concerning a lack of support, clarity, and guidance regarding online learning: *"more support and training in online teaching"*, *"training is not adequate"*, *"good samples and training on the techniques for online teaching are needed for reference", "video training step-by-step would be useful", "other institutes and universities had clear indications for online learning, and how this should be conducted during this period, as early as February", "frustration of teachers and students resulted from continual changes to the policy and mode of learning"* and *"administrative support was not always available to resolve issues, students came to teachers for advice after not being able to reach various supporting units, adding to our workload."*

3.5.5. Student assessment

Issues were reported about the online submissions of assessments through Moodle: *"for assignment collection, Moodle could show an overview of the assignment submission progress, to save time digging into each assignment box"* and *"there could be a quick button for late submission follow up - just one click, and students will receive a follow-up email."*

3.6. Teachers online benefits

3.6.1. Schedule/Time

Teachers felt online learning and remote working, provided greater flexibility to their schedules, with the additional benefit of money and time saved through reduced travel: *"for online teaching I had flexibility in my schedule", "it was good to have more flexible time to prepare teaching materials"* and *"saved travel costs and time."*

Although there was limited time to transition to online learning during the COVID-19 pandemic, positive outcomes were still reported: *"a bit rushed to prepare online lessons, but with time this will improve students learning experience."*

3.6.2. Mode of teaching

Being enforced to adopt online teaching enhanced some teachers ability to teach online and use different software: *"I* familiarized myself with different online teaching tools", *"I used more new technologies", "I learned how to use Microsoft Teams"* and *"I've explored a different way of teaching, and now reviewed my traditional teaching methods"*

Some teachers now seemed more comfortable in adopting a blended learning approach in the future: *"online/distance learning is the future trend, a blended mode of face-to-face and distance is the best option", "blended learning will continue to trend, and become easier to implement in the future"* and "*online teaching can be used to supplement future face-to-face classes."*

3.6.3. Teaching materials/Lessons

Teachers benefited from being able to use multiple platforms to develop learning materials and aid teaching in lessons: *"I learned how to better use online teaching resources and develop materials", "multi-tasking in online teaching helped me support student learning", "students could multi-task effectively, such as checking up on things as the teacher is discussing them."*

It was suggested that materials could be used for future course developments: *"the recorded lecture materials can be useful for further development such as online degrees or master degrees."*

3.6.4. Communication/Interaction

Some teachers felt they could more effectively and efficiently communicate with students online: *"I communicated with my students anytime and anywhere"*, "t*eachers responded quicker, as students adopted the use of emails and Microsoft Teams messenger for communication", "I could work at any time, and answer students emails at night"* and *"I set up a late-night homework chat room, where I can support students working late."*

With improved modes of communication, teachers were able to foster improved teacher-student relationships: "*online learning was convenient and helped build a closer relationship with students"*, *"online communication helped quiet students, to connect and discuss things when they needed"*, *"some students stayed around after lessons and chatted, this kind of informal interaction helped get to know students better. I think I will continue this next semester" and "overall, I liked online learning and teaching as it created flexible and indirect interactions with students, so I could cater for certain learning styles."*

3.6.5. Student learning/Assessment

Some teachers reported that online learning improved students' punctuality and engagement: *"more students came to class in the later stage of semester, compared to the past", "some students were more willing to attend online class", "normally students would skip class to do homework at home or to complete assignments, but with online lessons, they were more likely to attend"* and *"through online learning, students discussed questions they had regarding assignments."*

Through an increased engagement with online learning platforms, teachers felt more confident and competent at using various functions: *"I am now more familiar with using Moodle for assessments"* and *"I was able to create assignment submission folders in Moodle for students."*

4. Discussion

A key finding from this paper is that higher education teachers and students in Hong Kong had similar issues and benefits regarding online education during the COVID-19 pandemic. However, some themes created were reported in both issues and benefits by teachers and students (e.g., communication/interaction). This may demonstrate that individual circumstances, abilities, preferences, and experiences, play an important role in satisfaction levels. Furthermore, highlights the multi-factorial and tailored

requirements for delivering and receiving quality online education, particularly when enforced by a pandemic.

Access to a reliable digital device, stable Wi-Fi connection, and appropriate software is rudimentary for the delivery and participation of online learning during the COVID-19 pandemic, and a major hurdle to those without (Coman et al., 2020). However, some participants in this study reported issues with these aspects. This coincides with a recent report that showed 10% of students in Hong Kong have no access to a digital device, and 40% share digital devices with family members (Reichert et al., 2020). With education moving online so rapidly during the COVID-19 pandemic, it has potentially further exposed digital inequality and the accompanying issues (Dhawan, 2020). Ideally, education institutes and governments would have time to strategically plan the required support for those in need during this transition, but this was extremely difficult given such a short timeframe.

4.1. Issues

Teachers and students with access to digital devices had issues using various software to develop, distribute, and access teaching and learning materials. Although it is commonly believed that teachers and students are digitally literate, and can understand and use various software (Niess & Gillow-Wiles, 2013). Conversely, the ability to deliver quality online education is often underpinned by a teacher's level of training or willingness to deliver (Zweig & Stafford, 2016; Coman et al., 2020). For example, some teachers enjoyed and independently learned how to use new software, while others felt this was very difficult without appropriate training and support. But given the practical nature of most courses at the higher education institute in this study, training received by teachers tended to be more focused on a blended style learning approach as opposed to being fully online. From a student's perspective, research suggests prior experience is not the most concerning factor regarding online education satisfaction and performance but is more associated with their teachers' ability, and their interpersonal attitude or acceptance of this mode of education (Zweig & Stafford, 2016; Hamutoglu et al., 2019; Widyanti et al., 2021). Similarly, those teachers who have demonstrated higher abilities in delivery quality online education, have seen greater student engagement and performance (Zweig & Stafford, 2016). However, as indicated by teacher's open-ended responses in this study, teachers had limited prior knowledge of student's willingness or opinion regarding online education. Therefore, the conduction of such surveys/research is essential to make informed decisions on future online education practices, particularly in the event of a pandemic or crisis.

Teachers and students reported various issues arising while conducting online education, that required immediate guidance and help from support staff (e.g., IT technicians). However, this was not always available. It is an important consideration that the implementation of online education, particularly for a whole institute as has been the case during the COVID-19 pandemic, the workload for IT technicians exponentially increases (Alhomod & Shafi, 2013). Furthermore, as with teachers and students, IT technicians require time to understand how to use new software and establish methods for resolving common issues (Alhomod & Shafi, 2013). An underlying issue reported in this study was the inconsistent communication and resolution of problems, whether that was between teachers, students, or support staff. Research suggests a negative by product of online education and administrative support is the lack of human interaction, which can sometimes lead to poor or missed communication, therefore opportunities for this should

be implemented where possible (e.g., instant messaging and video conferencing) (Murphy & Yum, 1998; Dhawan, 2020).

4.2. Benefits

Due to being completely online during the COVID-19 pandemic, teachers in this study were able to adopt a more flexible teaching schedule that met their and students' availability. The ability for teachers with high workloads to freely plan their schedules can provide considerable time and work-life benefits (Cole et al., 2014). This is important considering the additional workload placed on teachers while adopting online education, and other associated pressures that have come with the COVID-19 pandemic (e.g., looking after family members or children). Students also felt the benefit of not having to learn in a classroom at a specific time, and with resources being placed online they could study and revise anytime and anywhere, which is similar to that reported in Pakistan by pre-service teachers when using mobile learning technology (Asghar et al., 2021). Research suggests this allows students to learn according to their schedules and partake in other activities (e.g., work, physical activity) (Ghaderizefreh & Hoover, 2018). Another outcome of online education in conjunction with the travel precautions implemented during the COVID-19 pandemic, meant teachers and students did not have to travel to campus, which saved considerable time and money. It was reported this allowed teachers to spend more time preparing learning materials and students more time for studying. It has been shown that external factors such as work and finances, can decrease students' attendance and subsequently academic performance in higher education, therefore fully online or blended learning may help overcome this issue (Moores et al., 2019; Tani et al., 2019).

For online education to be effective, additional measures need to be taken by education institutes to provide quality digital content, such as lesson recordings (O'Callaghan et al., 2017). Providing lesson recordings can have a positive impact on students' satisfaction, understanding of lesson content, and subsequently performance (Traphagan et al., 2010). Whereas teachers have indicated that the negative impact of offering lesson recordings in addition to face-to-face lessons is a reduction in student attendance and restricting the style of lecture (O'Callaghan et al., 2017). However, during the COVID-19 pandemic, online education and lesson recordings were one of the few options for education institutes, and as students reported in this study, lesson recordings were expected. Furthermore, students who received video recordings of lessons in this study felt this benefited their learning and revision. Similarly, research suggests students who can obtain lesson recordings, to supplement other forms of learning score significantly higher on module-based assessments (Bos et al., 2016).

5. Conclusion

The main contribution of this study is to develop a deeper understanding of the experiences and opinions of teachers and students regarding online education during the COVID-19 pandemic. Although this study surveyed teachers and students from a single higher education institute, it still provides value to the growing body of literature regarding the issues and benefits of online education in Hong Kong. Higher education institutes can use the results of this study and the opportunities provided by this global pandemic to redefine and reconceptualize how to improve and support teachers and students in online learning environments.

Comparable to prior research addressing digital equality of students in Hong Kong, approximately one in ten students had no access to reliable Wi-Fi or digital device, and two in ten students did not have a digital device solely for their use. Additionally, students had difficulties in accessing and understanding specific software required for modules. This provides an opportunity for higher education institutes to develop resources (e.g., laptop rental schemes, student software subscriptions, and financial subsidies) to ensure digital equality for online learning.

For teachers, results indicated that they had greater accessibility to Wi-Fi and a digital device when compared to students, but similarly, two in ten did not have sole use of a digital device. This is an area often overlooked but is important to address, to ensure teachers can provide quality content and delivery of online teaching materials. Some teacher experiences indicated that attitudes towards online education and student-centered teaching may become more positive when having to adapt, engage, and use different software and teaching methods. Whereas teachers' negative experiences can be supported by providing training and guidance to improve their understanding and confidence in using online learning technologies (Hu et al., 2021).

Lastly, with the rise of blended and online education, it is important to consider the increased workload and challenges this place on IT departments. Although they were not surveyed in the present study, there seems to be a paucity of research in this area, therefore it is recommended future research also investigates their perspective on online education and whether they too require training, resources, and support.

6. Limitations

The survey used in this study was conducted online due to the COVID-19 pandemic, which may have caused difficulties for those without a reliable digital device or stable Wi-Fi connection. So, some students or staff may have been unable to complete the survey. Furthermore, due to participants and information presented in this study deriving from a single education institute, generalizing results to other institutes should be used with caution.

Author Statement

The authors declare that there is no conflict of interest.

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