Routledge
Taylor & Francis Group

Journal of Public Affairs Education

ISSN: (Print) (Online) Journal homepage: https://www.tandfonline.com/loi/upae20

Effective online education under COVID-19: Perspectives from teachers and students

Yifei Yan, Lina Vyas, Alfred M. Wu & Stuti Rawat

To cite this article: Yifei Yan, Lina Vyas, Alfred M. Wu & Stuti Rawat (2022) Effective online education under COVID-19: Perspectives from teachers and students, Journal of Public Affairs Education, 28:4, 422-439, DOI: 10.1080/15236803.2022.2110749

To link to this article: https://doi.org/10.1080/15236803.2022.2110749

JOURNAL OF PUBLIC AFFAIRS EDUCATION
2022, VOL. 28, NO. 4, 422–439
https://doi.org/10.1080/15236803.2022.2110749

Routledge
Taylor & Francis Group

Effective online education under COVID-19: Perspectives from teachers and students

Yifei Yan [a], Lina Vyas [b], Alfred M. Wu [c], and Stuti Rawat [b]

[a]Department of Politics and International Relations, University of Southampton, UK; [b]Department of Asian and Policy Studies, The Education University of Hong Kong; [c]Lee Kuan Yew School of Public Policy, National University of Singapore

ABSTRACT

Making online education effective and engaging has been a policy priority in the higher education (HE) sector since the COVID-19 pandemic arose in 2020. Based on an online survey and qualitative interviews, we examine experiences of HE students and teachers in Hong Kong, and provide recommendations that can enable countries/economies to leverage on the good practices of online education to rejuvenate HE in the post-COVID era. We find a need for greater institutional support beyond its current availability. Students' perception of online education is less optimistic than what such labeling as "digital natives" suggests. However, with time, online education is being viewed more positively. Teachers find their online education workload to be higher. More female teachers cite difficulties in balancing work and life, while older teachers report more technological difficulties. Since many respondents come from public affairs programs, which emphasize interaction in the classroom, the findings suggest that a rethinking of pedagogical strategies of public affairs education is required.

KEYWORDS

COVID-19; higher education; Hong Kong; online education; online engagement; work-life balance

Introduction

The novel coronavirus (COVID-19) pandemic has caused unprecedented disruptions to almost all aspects of socio-economic life on a global scale. The higher education (HE) sector is no exception, as evidenced by the large number of Higher Education institutions (HEIs) that have been forced to close physical amenities and move teaching and learning activities to online platforms (Sahu, 2020). While many HEIs may have had prior experience of online education before COVID-19, very few within the non-Western context had adopted it on such a scale and intensity as demanded by the pandemic. How effective online engagement – productive behavioral, emotional and cognitive involvement with teaching and learning activities conducted on online platforms (Morgan-Thomas & Dudau, 2019)– can be ensured in the context of COVID-19 and beyond it,[1] therefore remains an ongoing inquiry.

To fulfill this task, it is essential to first gain a more in-depth comprehension of the experience and perspectives from both sides of teaching as well as learning. Gaining a solid grasp of the on-the-ground situation through this exercise, we argue, is a crucial step toward

CONTACT Stuti Rawat stuti.rawat@gmail.com Department of Asian and Policy Studies, The Education University of Hong Kong, 10 Lo Ping Road, Tai Po, New Territories, Hong Kong.
Supplemental data for this article can be accessed online at https://doi.org/10.1080/15236803.2022.2110749

the design and implementation of policies that can effectively address the needs and concerns of those actors. For that purpose, this article explores a wide range of factors that facilitate or prevent the engagement of teachers and students through their own accounts. Not only are technology-related factors included, we further explore factors such as work style, work-life balance, and institutional support.

Through an online survey supplemented by follow-up interviews with teachers and students in Hong Kong that covered a longer period (June 2020 to August 2021) during which HEIs switched to online education, we find that most students and teachers had none or limited prior experience of online education and/or working from home. Both groups expected and appreciated technical support, but were nevertheless faced with distractions of various kinds. Students' perception of planned online education was relatively more positive as compared to when online education was imposed as an emergency response. Although there was acknowledgment at the institutional level of the struggles in working and studying from home, support was restricted to basic tasks such as help with technical management of institutional e-mail accounts, class materials' storage, and so forth.

Our study departs and complements the existing literature in multiple ways. First, there are few studies that manage to capture the experience beyond a small number of interviewees or a sample drawn from a single institution. Thus, we improve upon existing studies through the larger sample of our survey which spans multiple HEIs supplemented with qualitative data. Second, to the best of our knowledge, this article is among the few that consider the perceptions of *both* teachers and students, unlike most studies which tend to focus on either one of the two groups. This allows us to gain a more comprehensive understanding of online engagement. Third, most studies have focused on online teaching when it was first imposed as an emergency response in the early stages of the pandemic. In contrast, the longer time span of our study allows us to meaningfully compare perceptions of online education when imposed as an emergency response and later when it was rolled out in an institutionalized manner and coping strategies that were developed by respondents over time. Finally, our study joins an emerging literature which helps bring a more nuanced understanding to both Hong Kong's HE governance and its COVID-19 response (e.g. Jung et al., 2021; Vyas & Butakhieo, 2021). While some of our findings and recommendations may be specific to Hong Kong, others are relevant beyond this immediate context of making online HE work during and after COVID-19.

The rest of the article is organized as follows. The subsequent section reviews the existing literature. This is followed by the reporting of our methods and results, and a discussion section where we outline our recommendations before concluding.

Literature review

The practice of online education[2] emerged with the advancement of technology, especially over the last few decades. Not surprisingly, in research on online HE until the breakout of the current pandemic, online engagement was mainly scrutinized through the theoretical lens of learning technology and pedagogy (Rushby & Surry, 2016). While valuable, this technology-centered approach is not adequate for achieving effective online engagement under the unprecedented situation of COVID-19 in the HE sector. On the one hand, technological infrastructure, as emphasized by this literature, is increasingly available, which is what enables online education to be a viable alternative in which one of the

main activities of the sector, namely teaching and learning, can be resumed notwithstanding pandemic disruptions. On the other hand, even in the ready presence of technology, the coupling of online education with working/studying from home as the new normality under COVID-19 suggests a blurring of previous boundaries between work/study and life as never before experienced (Yan, 2020).

Thus, making online education work under COVID-19 calls for a broader understanding of what is entailed in online engagement under COVID-19. Morgan-Thomas and Dudau (2019) serves as a valuable starting point for this. Incorporating insights from earlier literature on student engagement, it depicts online engagement as "a multidimensional concept that encompasses behavior, emotion and cognition" (p. 564) and clarifies its distinctions from related concepts such as participation, attendance, and motivation. While we largely concur with this multidimensional depiction, our point of departure is that as HE teaching and learning activities are a two-way process of co-production, so must teachers' productive involvement be considered to make the conceptualization complete and comprehensive. This broadened focus is further justified given the critical role of teachers in online HE (Gay, 2016), especially since the onset of the pandemic (Martin et al., 2019).

Whether or not with an explicit attention to online engagement, there is nevertheless a burgeoning literature that seeks to capture the online education experience within the HE sector since the beginning of the pandemic.[3] Depending on the main methods of inquiry, the existing literature can be divided into three groups.[4]

The first group of literature mainly examines policy documents at the regional and national levels. El Masri and Sabzalieva (2020) analyzed policy announcements at HE institutional, regional, and federal levels in Canada between March and April 2020, covering what they call response and mitigation phases. Their findings suggest that "although many actions were taken to support HE, they were largely dispersed and uncoordinated" (p. 324). Support for students was mostly in terms of financial and welfare packages, job creation and immigration matters rather than boosting their engagement in online learning. Examining policy documents from universities in Australia, the rapid assessment by Sutherland et al. (2021) similarly reveals that little attention was paid to the gender aspects of the pandemic response. Comparing policies during the pandemic in Italy and Switzerland (albeit not HE-specific), Malandrino and Sager (2021, p. 9) find that despite the "wide range of distance-teaching-related policy measures dealing with the practical, substantial aspects of teaching," the non-compulsory nature of these "guidelines and resources" means that teachers "had to leverage their own skills, experience, and in some cases their willingness to deliver the public service."

In addition to scrutinizing policies in the abstract, it is necessary to make in-depth inquiries into teachers' and/or students' experiences during this pandemic period. This is not only because policy documents that seek to comprehensively and systematically strengthen online engagement are identified as highly scarce in the literature (Clancy & Sentance, 2020; El Masri & Sabzalieva, 2020), but even when such support is available, it is the teachers and students who execute and/or experience these policies. In the second group of studies, such inquiries were made through interviews, focus-group discussions and self-reflections. Teachers and students who have experienced online HE during the pandemic are arguably the best placed to provide rich, in-depth individual accounts. However, the extent to which these accounts are representative of the wider geographical context (region or country) may be limited, whether

or not this has been the explicit purpose of these studies, when they are rooted in the experience of a single HEI (e.g. Agasisti & Soncin, 2021; Moja, 2021). Notwithstanding these limitations, this group of literature provides a foundation for researchers to supplement the broad focus on the national/regional-level policies with a much-needed picture on the ground.

The last group of literature focuses similarly on individual experiences, yet employed quantitative methods such as surveys. Surveys have been the most common method used in researching online education during COVID-19 in general (Durak & Çankaya, 2020; Rawat et al., 2022). However, with rare exceptions (Badri et al., 2021; Mok et al., 2021; Yaghi, 2021), the sample of most surveys has been confined to a single HEI (e.g. Agormedah et al., 2020; Alawamleh et al., 2020; Mishra et al., 2020; Rifiyanti, 2020), similarly limiting their ability to speak for a wider context beyond where the sample is drawn from. Again with rare exceptions (Mishra et al., 2020; Roy & Covelli, 2020), most studies survey either teachers (König et al., 2020; McGaughey et al., 2021) or students (e.g. Adnan & Anwar, 2020; Allam et al., 2020; Rifiyanti, 2020), thereby missing the opportunity to grasp comprehensively the experience of those at the dispensing and receiving ends of online HE. Finally, the study of engagement of online HE in this group (and the empirical literature in general) remains fragmented. While there are studies that looked at a variety of aspects such as accessibility and connectivity (Agormedah et al., 2020), self-directed learning and motivation (Allam et al., 2020), and teacher-student communication (Alawamleh et al., 2020; König et al., 2020), there is yet to be an overarching framework based on which online HE engagement can be explored holistically.

In sum, while existing literature has substantially advanced our understanding of the multiple facets of teachers' and students' experience of online HE during the pandemic across different contexts, effective engagement in online HE in the current scenario – a question that is of high policy pertinence – is yet to be satisfactorily addressed. A prerequisite for policy effectiveness in this regard is to understand the ground-level perspectives. Yet, for studies to have a broad and expansive policy relevance, there is an urgent need to go beyond reporting the experience of a highly selective number of ground-level actors within a single HE institution relying on a single methodology. There is also a need to comprehensively grasp the experience of actors on *both* sides of online teaching and learning activities.

Hence, with the aim of filling the gaps summarized above, the research question that this article seeks to answer is: How do teachers and students in HEIs in Hong Kong perceive their experience and effectiveness of engaging in online education during the pandemic?

Research methods

Context of the study and the online survey design

The primary mode of enquiry for our study was an online survey of teachers and students in Hong Kong's HEIs. Hong Kong was purposively chosen as our empirical focus not only because it has been considered an important leader within non-Western contexts in terms of the competitiveness of its HE sector (Mok, 2014), but also because of the extensive practice of online education within its HEIs even prior to the pandemic (Holliday & Postiglione, 2020). Hong Kong was among the first places to experience COVID-19, but

unlike the rest of the world, Hong Kong had already experienced a widespread imposition of online education in the HE sector due to the political strife and protests in late 2019 which saw the large-scale involvement of university students (Shek, 2020). Just as the social unrest was beginning to somewhat subside, and Hong Kong's universities had resumed face-to-face teaching, COVID-19 began to emerge and the HEIs switched to online education once again (Jung et al., 2021).

Throughout the pandemic, HEIs' decisions to continue online education has been based on signaling received from the government in terms of the restrictions and social-distancing measures announced. Given the "dynamic zero-COVID" policy stance for the larger part of the last two years, social restrictions including those limiting the size of public gatherings have periodically come into effect (Ma & Parry, 2022), thus essentially rendering face-to-face classes unfeasible. During this time, HEIs have had the discretion to deliver online education in the manner and format they consider to be most suitable. This predominantly took the form of synchronous online teaching.

The continuation of online education during the pandemic was also facilitated by the official recognition given to this alternative mode of teaching by the Chinese Service Center for Scholarly Exchange (People's Republic of China, Chinese Service Center for Scholarly Exchange, 2021), the official organization that provides overseas credential evaluation and recognition services in mainland China – the region from where the majority of non-local students in Hong Kong's HEIs come.

While there is ample literature documenting Hong Kong's early "successes" in managing the pandemic (Hartley & Jarvis, 2020), and subsequent "mismanagement" in 2022 which saw death rates soar (Ma & Parry, 2022; Taylor, 2022), there is rarely any comprehensive and nuanced exploration of its online education practice as experienced by both sides of teaching and learning and across different levels of HE, largely mirroring the literature gaps summarized in the previous section.

To fill these gaps within the specific setting of Hong Kong, we designed two separate teacher/staff and student survey questionnaires[5] which were guided, and in turn operationalized, by an exploratory framework informed by the literature, and drew together various elements of online engagement that remained fragmented in existing studies. Both questionnaires were finalized after consulting with experts on HE policies.

The questionnaires began with background questions covering the previous experience in online learning of students and that of working from home including online teaching by staff. This was based on studies before and during the pandemic that consider prior experience as a determinant for effective online engagement (e.g. Mok et al., 2021; Roy & Covelli, 2020). After that, the questionnaires included various measurements to comprehensively capture online engagement as experienced and perceived by teachers and students. Some elements were common for students and teachers (whose specific manifestations may nevertheless be different), whereas others were designed to reflect the distinctive activities and experience of the two groups.

To start with, both questionnaires contained items regarding "Individual and environmental prerequisites" (for students) or "E-readiness" (for teachers) as a basis for effectively engaging in online HE. According to the literature, students' perception of their ability and use of computers, software, and the internet are important prerequisites for online learning engagement (Chen, 2017; Hung et al., 2010). Likewise, for online teaching staff, e-learning readiness includes both technical and lifestyle readiness (Gay, 2016; Keramati et al., 2011).

Items in this category were measured on a five-point Likert scale, from "strongly disagree" (1) to "strongly agree" (5).

The next common set of items related to institutional and other support, measured using a similar five-point Likert scale. For students, "Institutional and pedagogical support" for their learning is an essential factor in enhancing the online learning experience of students (Lee et al., 2011; Lee, 2010; Ni et al., 2021). Similarly, for staff, working/teaching from home requires various forms of "Institutional support" (Baker et al., 2007).

"Learner control and experience" was a distinctive set of items for the student questionnaire, as it is considered an essential element for student learning performance. Online learning provides students the flexibility to control their learning, from managing time or skipping some of the course content to controlling their study pace (Hung et al., 2010; Stansfield et al., 2004). As such, effective online learning engagement would depend on how students interact with online courses (Lin & Hsieh, 2001). Studies have found that students with prior online learning experience tend to engage more and be satisfied with online learning (Rodriguez et al., 2005). Items in this category were therefore measured by comparing the level of learner control in online learning with that in traditional classroom learning on a five-point Likert scale from "much more/higher" to "much less/lower."

The counterparts to these items in the staff questionnaire were captured under "Individual work styles and perception." Items here were operationalized by measuring the degree of the challenges posed by working from home compared with working in the office on a five-point Likert scale ranging from "much more" (1) to "much less" (5). For online teaching staff currently experiencing blurred boundaries between work and family (Kossek et al., 2006), "Boundary management strategy" was also considered. Thus, items here concerned the degree of the individual's effort to separate their work role from home role. This too was measured on a five-point Likert scale, from "strongly disagree" (1) to "strongly agree" (5).

Lastly, to capture the perceptions of "Teaching outcomes" (for students) and "Online teaching experience" (for staff) as a result of online education, both quantitative and qualitative responses were sought to triangulate the findings. Quantitative evaluation was measured using a five-point Likert scale to measure students' and staff's satisfaction with the current episode of engagement with online HE. Qualitative comments took the form of open-ended questions to investigate what students and staff liked best about online learning and working from home, what challenges they faced, and what they thought the university could do to help.

Survey strategy

Students and staff at eight universities and two community colleges in Hong Kong were invited via e-mail to complete the respective surveys anonymously[6] from June to October 2020. These eight universities comprised all of the Hong Kong government's University Grants Committee-funded universities.[7]

During the period in which the survey was administered, students and staff should have experienced online education for a few months already since most HEIs had switched to online education by January 2020 (Mok et al., 2021). Reaching out to all public HEIs in Hong Kong helped ensure that our sample was not constrained by idiosyncratic experiences of one or two universities and was more likely to capture a holistic picture, although the lack

of institutionally disaggregated data as per the anonymity requirement meant that we were not able to explore similarities or variations across institutions. A total of 505 students and 350 staff completed the survey, whose characteristics are shown in Tables 1 and 2 respectively.

No claim will be made that this sample is representative of *all* students and staff in HE institutions in Hong Kong. One potential limitation could be that the survey may not have elicited an adequate response from those who faced extreme challenges in terms of digital connectivity. Although the number of this sub-group is expected to be relatively small, we attempted to compensate for this limitation through semi-structured interviews and workshop discussions which will be explained subsequently. Regardless, for the purpose of this research, the diversity of sample characteristics can still ensure that a meaningful exploration can be carried out and rich perceptions revealed, with a level of generalizability that is higher than most previous studies reviewed earlier.

Supplementary qualitative study

Following the survey, we conducted semi-structured interviews with 18 students and seven teachers[8] from different HEIs in Hong Kong between November 2020 and March 2021, who were recruited through a combination of purposive, snowball, and convenience sampling. We also engaged in discussions with 28 current and recently graduated students during a workshop related to Human Resources Management under COVID-19 in August 2021. Table A1 in the Appendix presents the respondents characteristics in the qualitative sample.

Table 1. Characteristics of the student survey sample.

Students: Demographic Characteristics			Students: Educational Background		
	Number	Percentage		Number	Percentage
Gender			***Prior experience of online education***		
Female	357	70.7	Yes	282	55.8
Male	148	29.3	No	223	44.2
Age (in years)			***Level of study***		
<20	113	22.4	Undergraduate	286	56.6
20 to 25	276	54.7	Postgraduate	174	34.5
26 to 30	57	11.3	Sub-degree	45	9.1
>30	59	11.7			
			Year of study: Undergraduate students		
Student status			Freshman	106	37.1
Domestic	457	90.5	Sophomore	41	14.3
International	48	9.5	Junior	69	24.1
			Senior	70	24.5
Study major			***Year of study: Postgraduate students****		
Business	117	23.1	Year 1	148	85.1
Education	125	24.7	Year 2	13	7.5
Engineering	14	2.8	Year 3	2	1.2
Liberal Arts	70	14	Year 4 and more	11	6.3
Natural Sciences	40	7.9	***Year of study: Sub-degree students*****		
Social Sciences	139	27.5	Year 1	29	64.4
			Year 2	15	33.3
			Year 3	1	2.2

Percentage figures may not sum to 100 because of rounding off.
*Postgraduate students include students enrolled in Master's degrees and PhD programmes.
**Sub-degree students are students registered for pre-associate degrees, associate degrees, diploma or higher diploma courses.

Table 2. Characteristics of the staff survey sample.

Staff: Demographic Characteristics			Staff: Work Experience		
	Number	Percentage		Number	Percentage
Gender			***Employment status***		
Female	178	50.9	Full-time	331	94.6
Male	172	49.1	Part-time	19	5.4
Age (in years)			***Employment type***		
<25	8	2.3	Fixed term contract	207	59.1
25 to 35	93	26.6	Permanent contract	106	30.3
36 to 45	124	35.4	Temporary contract	37	10.6
46 to 59	109	31.1			
60 and above	16	4.6	***Years of work in HE***		
			<5	79	22.6
Educational level			5 to 10	111	31.7
Bachelor's Degree	13	3.7	11 to 20	103	29.4
Master's Degree	105	30	>20	57	16.3
Doctoral Degree	232	66.3			

Percentage figures may not sum to 100 because of rounding off.

The interview and discussion questions were informed by our survey results, which allowed us to perform in-depth follow-up investigations. These inquiries were made at a time when online education had become a more planned strategy, in contrast with the survey period when online education was still being launched as an emergency response to the pandemic. This offers us a good opportunity to compare across these two periods and the coping strategies adopted by teachers and students over time. Insights from the qualitative enquiries are reported in the next section, whenever relevant, to complement and triangulate the survey results.

Findings

We tested the internal consistency of the measurements of survey instruments using Cronbach's alpha (α). Based on the conventionally used threshold of $\alpha = 0.7$ (Taber, 2018), the reliability of all measurements for the respective student and staff survey was good ($\alpha > 0.7$).[9]

Not quite experienced but generally e-ready

For both students and staff surveyed, the intensity of online education under COVID-19 was something hardly experienced before. Prior to the pandemic, 44% of students had not experienced an online lecture or class, and only 14% of the staff reported having worked from home frequently. For the majority of staff (76%), online teaching was a relatively new experience – having engaged in it for less than a year.

Despite this lack of prior experience, both groups were generally e-ready. The student respondents had an overall mean score of 3.77 (0.70)[10] out of 5, in terms of the individual and environmental prerequisites for online learning such as computer, internet, and online communication. E-readiness for the staff respondents was even higher, at 3.91 (0.53) out of 5, among which their technical readiness (4.03 ± 0.67) was slightly higher than lifestyle readiness (3.77 ± 0.61). A constraint was nevertheless reported by both students and staff

respondents regarding physical space. At least a fifth of the students (22%) indicated that they lacked a quiet and undisturbed space at home to adequately fulfill their online learning requirements. Similarly, 26% of the teachers indicated that they lacked a private place at home to work from.

Institutional support: available but could be better

The institutional decision to shift to online education in light of the COVID-19 pandemic was considered timely by the majority of students (76%) and staff (84.4%). However, institutional support was neutrally evaluated by the respondents, with a score of 3.60 (0.72) for students and 3.71 (0.60) for staff out of 5. Students reported small variations across the items: the lowest scores were for the university's sensitivity to the difficulties faced by students in transitioning toward online learning (3.48 ± 1.02) and the university conducting training on effectively managing online learning, using online platforms and for maintaining and enhancing well-being (3.46 ± 1.04). For the surveyed staff, over 80% reported institutional support for basic communication and technology, such as an institutional e-mail account, class materials' storage, and a licensed account for online meeting software. Unlike students, teachers also rated institutional support in the form of training more highly (3.62 ± 0.89). However, support for specific items when working from home, such as human resources support (3.16 ± 0.96) and administrative support (3.48 ± 0.95), were rated much lower.

Interestingly, there was a divergence in how staff evaluated the support received from their immediate supervisor versus that provided by the larger institute. This was reflected in the high proportion of the staff who agreed that their supervisor trusted them to be working to the best of their ability when working from home (76%) and that their supervisor was available for support and guidance when working remotely (78%). In contrast, only 55% of the staff agreed with the statement that their institution acknowledged the potential challenges to their work-life balance arising from working from home, and even fewer respondents (51%) perceived that their institution was willing to make accommodations in light of these challenges. In a similar vein, staff rated their institution's commitment to encouraging and sharing good practices with a view to maintaining a good work-life balance during online education, relatively low (3.47 ± 0.92).

Distractions while learning/teaching online

Notwithstanding their e-readiness, students reported a lower level of learner control in online learning than in traditional classroom learning. The mean score of the self-ratings of the questions was 3.36 (0.74). On average, they perceived themselves to have lower motivation, discipline, concentration, interaction, and communication in online learning as compared to traditional classroom instruction.

For the surveyed staff, close to 60% perceived the workload associated with online classes to be higher as compared to traditional teaching. Moreover, working from home caused disturbances to their work style too. Notably, 45% of the staff respondents shared a work-from-home space with at least one other person. The majority (55%) felt much more distracted by family duties when working from home as compared to working from the office. Consequently, a large proportion (43%) indicated that it was much more difficult to

balance work and family roles when working from home, compared with working in the office. A higher percentage of female respondents (48%) felt this to be the case as compared to men (38%).

(Dis)satisfaction with teaching and learning outcomes

For students, teaching outcome received the lowest overall scores among the four dimensions with a mean of 3.34 (0.88). While students appeared to appreciate the flexibility offered by online education (3.7 ± 1.08), scores for other parameters of online education, such as critical thinking (3.15 ± 1.03) and horizon expansion (3.28 ± 1.06) were much lower. Although satisfaction with the learning arrangement for the students was not particularly high (3.49 ± 1.08), they valued the opportunity to continue their education via online classes during the pandemic (3.71 ± 1.01).

Overall, teachers did not have a very positive impression of the impact of online teaching (3.47 ± 0.39) either. Like students, teachers appreciated the flexibility offered by online education (3.97 ± 0.96) and the ability to record and share lectures with students (3.98 ± 0.96). Staff (67%) especially valued learning to use new technology and being able to work from home during the pandemic. Despite that, they viewed online classes as inferior to face-to-face instruction with regard to maintaining a high level of interaction and motivating students, as reflected in their low rating (2.52 ± 1.07) for the statement, "I believe the quality of online education is as good as face-to-face instruction."

Insights from qualitative investigations

Our survey included open-ended questions for the respondents to share the challenges and advantages of online education.[11] With respect to challenges, the common themes that emerged from students and staff related to interaction, technical issues, and distraction. Regarding what respondents liked about online education, the common themes included flexibility, convenience, and the time saved from not having to commute.

These themes guided our use of follow-up interviews in order to the understand respondents' experiences and coping strategies in more detail. Overall, the insights generated from our qualitative investigations complement the survey results in two important ways.

First, many of the comments from our respondents directly confirmed and triangulated the survey findings. For example, in terms of challenges posed by the lack of space at home, one staff member remarked that the government decision to allow day-care centers to re-open was " . . . the happiest day for me [as] it finally gave me space and time to work without my children around." As for the increased distraction in attending online classes, some students also attributed it to the format of online education which allowed them to engage in multiple tasks simultaneously (such as browsing social media or chatting) while attending synchronous online lectures. In a traditional classroom, they felt that the instructor's presence limited the degree to which they engaged in such activities. Teachers too felt that they had limited visual cues about how students were responding. This often led them to wonder whether students were even behind their screens, which they countered by incorporating participatory activities such as collaborative virtual whiteboards. For teachers, our survey further found that age seemed to play a role with respect to the technological

challenges associated with online education: fewer staff between the ages of 25–35 years cited technological difficulties (25%) as compared to those in the 36–59 years age group (36.8%). This was also confirmed during the interviews, as older staff spoke of difficulties in navigating online meeting platforms and cloud storage systems.

Second, the interview findings also extended our understanding of other issues and concerns faced by the respondents which were not adequately explored in the survey. For instance, students expressed that worry about the pandemic and political developments in Hong Kong made it difficult for them to focus. But being able to attend classes from home made them feel less at risk from the COVID-19 virus. This suggests a nuanced balancing between their health concerns and educational needs. Those students that had experienced online teaching both as an emergency response and in a planned manner also felt greater satisfaction with the latter. While students and teachers both spoke of feeling fatigued with increased screen time, we further learned how some tried to cope with it. For example, one postgraduate spoke of limiting their screen time for non-essential activities: "Before the pandemic I used to mindlessly watch a lot of shows on my laptop. Now I only watch something if I really like it." As for teachers, a positive change over time that was reported was that the number of institutional training and tools related to online teaching increased significantly. But this was less the case for support on other dimensions, such as mental health and maintaining a work-life balance. One staff member mentioned with disappointment their institute's decision to reduce the financial support (in the form of performance bonuses), with the HEI justifying it on the grounds of the greater economic uncertainty facing the HE sector.

Discussion

Our study found that most teachers and students had little experience of online learning and online working from home prior to COVID-19. Such a high incidence of inexperience casts a questioning light on the labeling of young generations as "digital natives" over the past two decades (Jones et al., 2010) –perhaps even more so given Hong Kong's aspiration to be a leader of ICT in education ever since its first policy document on this issue in 1998 (Law et al., 2009). Yet despite such inexperience, most students and teachers agreed that they have a high level of readiness for but not limited to the technological front. Insofar as earlier studies identified the amount of prior experience (Roy & Covelli, 2020) or self-rated IT proficiency (Mok et al., 2021) as determinants of satisfaction or level of comfort, the findings here seem to present a mixed picture, which warrants further investigation.

Mixed feelings about online learning were also observed. Like Mok et al. (2021), our study reveals that students' perceptions of their online learning experience were not overly optimistic. However, our qualitative investigations suggest that the reception of planned online education was more positive as compared with online education imposed as an emergency response. The former provided teachers relatively more time and resources to invest in up-front planning for an online format, something which Gibson and Trump Dunning (2012) consider critical for creating a comprehensive plan of instruction.

Overall, students rated their self-control in regard to online learning lower than for traditional learning. Despite favoring the flexibility, time saving, and comfort – which were more lifestyle-related – they still faced both distractions and technical problems, which were the major obstacles to effective online engagement. The constraint posed by the lack of

space at home to attend online classes in a quiet and undisturbed environment, similarly reported in Mok et al. (2021), highlights the important value of on-campus physical space provided by HEIs in Hong Kong.

Lastly, compared with barriers to engagement for students in developing-country contexts (e.g., Adnan & Anwar, 2020; Agormedah et al., 2020), the acknowledgment of connectivity, technology-utilization, resources, and support by students in Hong Kong differs substantially. In contrast, the findings on lacking motivation and communication with teachers and peers are in line with the literature (Alawamleh et al., 2020; Allam et al., 2020), suggesting these to be common challenges regardless of the level of socio-economic development.

Like students, the staff also faced difficulties in individual work style despite a fair level of e-readiness and institutional support for basic tasks. Although they similarly valued flexibility and the opportunity to learn to use new technology, the problems of motivating students and increasing participation appear to have increased their burden. In line with existing literature (e.g. Malandrino & Sager, 2021), we found that staff reported spending more time when teaching online as compared to traditional classroom teaching. Our finding that a greater proportion of female staff reported difficulties in balancing their work and life while working from home under COVID-19 also confirms what early literature on the pandemic suggested – that women academics are likely to bear a greater brunt of the pandemic (Gabster et al., 2020). Unfortunately, specific support and guidance on managing their work-life balance was found to be highly inadequate in our survey.

Moving on to consider the policy implications of our findings, it is worth highlighting again the "silver lining" from our qualitative investigation that online education, when designed and delivered in a more carefully planned manner, was better received than when introduced as a quick emergency response. As most institutions were forced to move teaching and learning online very quickly during COVID-19, more effective control of the pandemic over time created promising scope for more deliberatively planned online education to play an important role in "building back better" in the higher education sector beyond COVID-19. Yet to fully realize such potential, online engagement needs to be substantially improved, for which the insights from this study help inform at least three policy recommendations.

The first is through pedagogical strategies that can leverage on the technological features that online education offers (see Hu & Johnston, 2012; Bryan et al., 2018) for instance, through "gamification" (Ofosu-Ampong, 2020) or real-time polling and multiple-choice quizzes during classes. These measures can help retain students' attention while reducing the workload for teachers in the form of evaluation and feedback, although it needs to be noted that some particular measures might work differently in different modes of online education (e.g., synchronous versus asynchronous).

Second, at the institutional level, students should be allowed access to existing on-campus infrastructure, such as spare classrooms, for attending online classes while maintaining the required social distancing. Time management training would also be helpful for students to study more effectively in online environments, as evidenced by a recent experimental study in Canada (Tabvuma et al., 2021). For the staff, relaxation of non-teaching expectations and provision of tailored training on one's work-life balance can help them better manage the additional workload associated with online education.

Lastly, within the broader community, in public centers and public libraries designated "E-learning" spaces can be offered to allow students to attend classes online. Access to basic technical assistance can also be planned in these spaces, which would be crucial to closing the gap for students who are disadvantaged in terms of digital accessibility.

Conclusion

How can higher education institutions advance online engagement, so as to conduct online education effectively and efficiently? This article sheds nuanced light on this question through an original survey of both students and teachers across public universities in Hong Kong and through supplementary, smaller-scale qualitative interviews, to enquire how teachers and students perceive their experience and effectiveness of engaging in online education during the pandemic.

Addressing this question is not only immediately relevant to the current scenario of COVID-19, but the lessons learned can provide valuable guidance to similar crises beyond the near future, much as the experience of dealing with SARS and MERS previously has been found helpful in some of the relatively successful responses to COVID-19 (Hartley & Jarvis, 2020). Resilience and capacity gained through crisis management based on the "worst scenario" (Sharma, 2020), such as COVID-19 which is viewed by many as a "wicked problem," may also enable more competent responses to situations that are less severe or disruptive.

Our findings present a detailed account of the e-readiness, work style, and work-life balance of teachers and students in Hong Kong under the pandemic as compared with the traditional classroom setting, as well as during the pandemic over time. This comprehensive and nuanced picture allows us to offer policy recommendations that can better promote effective online engagement by addressing the challenges reported by participants at both the teaching and learning ends of online education.

Moving forward from this research, further inquiry into the policymaking side, especially from the perspectives of school management and HE policymakers and bureaucrats, would be important in revealing the challenges, solutions and required policy capacities in facilitating effective online engagement. Future research can also look at quantitative data on academic performance and course completion (see Ni, 2013), to facilitate a greater understanding of the long-term effects of online education.

Notes

1. At the time of writing, most HEIs in Hong Kong (and in many other parts of the world) continued to adopt online education in some format, hybrid or otherwise. With uncertainty around the evolving pandemic and its concomitant impact on higher education and international travel, the scale of online education is unlikely to revert to its lower pre-pandemic levels (Lockee, 2021).
2. Alternative terms used in the literature include distance learning, e-learning, online schooling, and so forth. In this article, we do not distinguish between the nuances of individual terms and use online education as a catch-all umbrella term.
3. We ran a query on the Scopus database for published articles featuring the words "online education" and "higher education" or "university" or "tertiary education," and their variants in the title, keyword or abstract; and found that from 2000 to 2019, the number of articles per year was never over 100. Yet in 2020 the number grew to 233 and by August 2021 it was 273.

4. The reason for focusing on the main methods of inquiry is for analytical clarity, as some articles have used mixed methods. The studies covered here are either about HE in general, or about public HEIs. Commercialization of HE under COVID and its impact has a separate literature (Urdan & Cooper, 2019), which is beyond the scope of this article.
5. In this article, the words 'teachers' and 'staff ' are used interchangeably for convenience unless otherwise specified. The questionnaires are available in the Appendix.
6. Anonymity was recommended during our consultations with HE experts and in small-scale pilots, as the feedback we received indicated that the respondents (especially staff respondents) were more comfortable participating in the survey when not asked to disclose their institutional affiliations.
7. While Hong Kong has 22 officially recognized degree-awarding HEIs, only eight are University Grants Committee-funded universities (Education Bureau, 2021).
8. We faced difficulties in recruiting staff as they were reluctant to speak about their experiences one on one.
9. Table A2 in the Appendix presents the detailed α values.
10. Standard deviation is reported in brackets; in subsequent parts of the article, it may also be reported after the ± sign.
11. Word frequency clouds based on the responses are presented in Figures A1 and A2 in the Appendix.

Acknowledgements

The authors would like to acknowledge and thank Ayesha Kumar and May Guan Jianmei for the invaluable assistance provided by them during the course of this research.

Disclosure statement

No potential conflict of interest was reported by the author(s).

Notes on contributors

Yifei Yan is a Lecturer in Public Administration and Public Policy at the University of Southampton, after holding an LSE Fellowship in International Social and Public Policy at the London School of Economics and Political Science for the past three years since September 2019. Her research interests lie at the intersections of public policy and administration, social policy and educational studies, with non-Western contexts including China, India and Brazil as the main empirical focus of her research.

Lina Vyas is an Associate Professor in the Department of Asian and Policy Studies at The Education University of Hong Kong, specializing in public policy and management. She has recently been involved in projects related to work-life balance, stress and work from home under COVID-19 and its future applicability, particularly in Hong Kong.

Alfred M. Wu is an Associate Professor in the Lee Kuan Yew School of Public Policy at the National University of Singapore. He is a development studies expert with publications in public finance, education, social protection, urban development, and local governance in China and East Asia. He previously held various positions at The Education University of Hong Kong, City University of Hong Kong, and Georgia State University.

Stuti Rawat is a Research Assistant Professor in the Department of Asian and Policy Studies at The Education University of Hong Kong. Her research falls under three core areas - sustainability, governance and education.

ORCID

Yifei Yan http://orcid.org/0000-0003-2833-5972
Lina Vyas http://orcid.org/0000-0003-4377-2572
Alfred M. Wu http://orcid.org/0000-0002-2689-6285
Stuti Rawat http://orcid.org/0000-0002-3073-4107

References

Adnan, M. & Anwar, K. (2020). Online learning amid the COVID-19 pandemic: Students' perspectives. *Journal of Pedagogical Sociology and Psychology*, *2*(1), 45–51. https://doi.org/10.33902/JPSP.2020261309

Agasisti, T. & Soncin, M. (2021). Higher education in troubled times: On the impact of Covid-19 in Italy. *Studies in Higher Education*, *46*(1), 86–95. https://doi.org/10.1080/03075079.2020.1859689

Agormedah, E. K., Henaku, E. A., Ayite, D. M. K., & Ansah, E. A. (2020). Online learning in higher education during COVID-19 pandemic: A case of ghana. *Journal of Educational Technology and Online Learning*, *3*(3), 183–210. https://doi.org/10.31681/jetol.726441

Alawamleh, M., Al-Twait, L. M., & Al-Saht, G. R. (2020). The effect of online learning on communication between instructors and students during Covid-19 pandemic. *Asian Education and Development Studies*, *11*(2), 380–400. https://doi.org/10.1108/AEDS-06-2020-0131

Allam, S. N. S., Hassan, M. S., Mohideen, R. S., Ramlan, A. F., & Kamal, R. M. (2020). Online distance learning readiness during Covid-19 outbreak among undergraduate students. *International Journal of Academic Research in Business and Social Sciences*, *10*(5), 642–657. https://doi.org/10.6007/IJARBSS/v10-i5/7236

Badri, S. K. Z., Wan Mohd Yunus, W. M. A., Ramos, H. M., & Mahmud, N. (2021). Remote learning and its implications toward study-life conflicts and the mental health of university students: Does studying at home or campus matter?. *Higher Education Research & Development*, 1–15. https://doi.org/10.1080/07294360.2021.2014407

Baker, E., Avery, G. C., & Crawford, J. (2007). Satisfaction and perceived productivity when professionals work from home. *Research and Practice in Human Resource Management*, *15*(1), 37–62. https://opus.lib.uts.edu.au/bitstream/10453/6434/1/2007000202.pdf

Bryan, T. K., Lutte, R., Lee, J., O'Neil, P., Maher, C. S., & Bryce Hoflund, A. (2018). When do online education technologies enhance student engagement? A case of distance education at University of Nebraska at Omaha. *Journal of Public Affairs Education*, *24*(2), 255–273. https://doi.org/10.1080/15236803.2018.1429817

Chen, I. S. (2017). Computer self-efficacy, learning performance, and the mediating role of learning engagement. *Computers in Human Behavior*, *72*, 362–370. https://doi.org/10.1016/j.chb.2017.02.059

Clancy, D. S. & Sentance, M. (2020). *Keeping students academically engaged during the coronavirus crisis–part one. Policy brief*. Pioneer Institute for Public Policy Research.

Durak, G. & Çankaya, S. (2020). Is there a change? Distance education studies in COVID-19 pandemic. *Asian Journal of Education and e-Learning*, *8*(3). https://doi.org/10.24203/ajeel.v8i3.6458

Education Bureau. (2021). Local higher education | institutions'|'local higher education | institutions. *Hong Kong Government Education Bureau*. https://www.edb.gov.hk/en/edu-system/postsecondary/local-higher-edu/institutions/index.html

El Masri, A. & Sabzalieva, E. (2020). Dealing with disruption, rethinking recovery: Policy responses to the COVID-19 pandemic in higher education. *Policy Design and Practice*, *3*(3), 312–333. https://doi.org/10.1080/25741292.2020.1813359

Gabster, B. P., van Daalen, K., Dhatt, R., & Barry, M. (2020). Challenges for the female academic during the COVID-19 pandemic. *The Lancet*, *395*(10242), 1968–1970. https://doi.org/10.1016/S0140-6736(20)31412-4

Gay, G. H. E. (2016). An assessment of online instructor e-learning readiness before, during, and after course delivery. *Journal of Computing in Higher Education*, *28*(2), 199–220. https://doi.org/10.1007/s12528-016-9115-z

Gibson, P. A. & Trump Dunning, P. (2012). Creating quality online course design through a peer-reviewed assessment. *Journal of Public Affairs Education*, *18*(1), 209–228. https://doi.org/10.1080/15236803.2012.12001678

Hartley, K. & Jarvis, D. S. L. (2020). Policymaking in a low-trust state: Legitimacy, state capacity, and responses to COVID-19 in Hong Kong. *Policy and Society*, *39*(3), 403–423. https://doi.org/10.1080/14494035.2020.1783791

Holliday, I. & Postiglione, G. (2020). Hong Kong higher education and the 2020 outbreak. *International Higher Education*, *102*(April), 20–22. https://www.internationalhighereducation.net/api-v1/article/!/action/getPdfOfArticle/articleID/2911/productID/29/filename/article-id-2911.pdf

Hu, Q. & Johnston, E. (2012). Using a wiki-based course design to create a student-centered learning environment: Strategies and lessons. *Journal of Public Affairs Education*, *18*(3), 493–512. https://doi.org/10.1080/15236803.2012.12001696

Hung, M. L., Chou, C., Chen, C. H., & Own, Z. Y. (2010). Learner readiness for online learning: Scale development and student perceptions. *Computers & Education*, *55*(3), 1080–1090. https://doi.org/10.1016/j.compedu.2010.05.004

Jones, C., Ramanau, R., Cross, S., & Healing, G. (2010). Net generation or digital natives: Is there a distinct new generation entering university? *Computers & Education*, *54*(3), 722–732. https://doi.org/10.1016/j.compedu.2009.09.022

Jung, J., Horta, H., & Postiglione, G. A. (2021). Living in uncertainty: The COVID-19 pandemic and higher education in Hong Kong. *Studies in Higher Education*, *46*(1), 107–120. https://doi.org/10.1080/03075079.2020.1859685

Keramati, A., Afshari-Mofrad, M., & Kamrani, A. (2011). The role of readiness factors in E-learning outcomes: An empirical study. *Computers & Education*, *57*(3), 1919–1929. https://doi.org/10.1016/j.compedu.2011.04.005

König, J., Jäger-Biela, D. J., & Glutsch, N. (2020). Adapting to online teaching during COVID-19 school closure: Teacher education and teacher competence effects among early career teachers in Germany. *European Journal of Teacher Education*, *43*(4), 608–622. https://doi.org/10.1080/02619768.2020.1809650

Kossek, E. E., Lautsch, B. A., & Eaton, S. C. (2006). Telecommuting, control, and boundary management: Correlates of policy use and practice, job control, and work–family effectiveness. *Journal of Vocational Behavior*, *68*(2), 347–367. https://doi.org/10.1016/j.jvb.2005.07.002

Law, N., Lee, Y., & Yuen, H. K. (2009). The impact of ICT in education policies on teacher practices and student outcomes in Hong Kong. In F. Scheuermann, F. Pedro (Eds.), *Assessing the effects of ICT in education– Indicators, criteria and benchmarks for international comparisons* (pp. 143–164). OECD.

Lee, J. W. (2010). Online support service quality, online learning acceptance, and student satisfaction. *The Internet and Higher Education*, *13*(4), 277–283. https://doi.org/10.1016/j.iheduc.2010.08.002

Lee, S. J., Srinivasan, S., Trail, T., Lewis, D., & Lopez, S. (2011). Examining the relationship among student perception of support, course satisfaction, and learning outcomes in online learning. *The Internet and Higher Education*, *14*(3), 158–163. https://doi.org/10.1016/j.iheduc.2011.04.001

Lin, B. & Hsieh, C. T. (2001). Web-based teaching and learner control: A research review. *Computers & Education*, *37*(3), 377–386. https://doi.org/10.1016/S0360-1315(01)00060-4

Lockee, B. B. (2021). Online education in the post-COVID era. *Nature Electronics*, *4*(1), 5–6. https://doi.org/10.1038/s41928-020-00534-0

Malandrino, A. & Sager, F. (2021). Can teachers' discretion enhance the role of professionalism in times of crisis? A comparative policy analysis of distance teaching in Italy and Switzerland during the COVID-19 pandemic. *Journal of Comparative Policy Analysis: Research and Practice*, *23*(1), 74–84. https://doi.org/10.1080/13876988.2020.1844544

Malisch, J. L., Harris, B. N., Sherrer, S. M., Lewis, K. A., Shepherd, S. L., McCarthy, P. C., Spott, J., Karam, E. P., Moustaid-Moussa, N., Calarco, J. M., Ramalingam, L., Talley, A. E., Cañas-Carrell, J. E., Ardon-Dryer, K., Weiser, D. A., Bernal, X. E., & Deitloff, J. (2020). Opinion: In the wake of

COVID-19, academia needs new solutions to ensure gender equity. *Proceedings of the National Academy of Sciences*, *117*(27), 15378–15381. https://doi.org/10.1073/pnas.2010636117

Ma, A. & Parry, J. (2022, April). When Hong Kong's "Dynamic Zero" Covid-19 strategy met Omicron, low vaccination rates sent deaths soaring. *BMJ*, *377*, o980. https://doi.org/10.1136/bmj.o980

Martin, F., Budhrani, K., Kumar, S., & Ritzhaupt, A. (2019). Award-winning faculty online teaching practices: Roles and competencies. *Online Learning*, *23*(1), 184–205. https://doi.org/10.24059/olj.v23i1.1329

McGaughey, F., Watermeyer, R., Shankar, K., Suri, V. R., Knight, C., Crick, T., Hardman, J., Phelan, D., & Chung, R. (2021). This can't be the new norm': Academics' perspectives on the COVID-19 crisis for the Australian university sector. *Higher Education Research & Development*, 1–16. https://doi.org/10.1080/07294360.2021.1973384

Mishra, L., Gupta, T., & Shree, A. (2020). Online teaching-learning in higher education during lockdown period of COVID-19 pandemic. *International Journal of Educational Research Open*, *1*, 100012. https://doi.org/10.1016/j.ijedro.2020.100012

Moja, T. (2021). National and institutional responses–reimagined operations–pandemic disruptions and academic continuity for a global university. *Studies in Higher Education*, *46*(1), 19–29. https://doi.org/10.1080/03075079.2020.1859688

Mok, K. H. (2014). Enhancing quality of higher education for world-class status: Approaches, strategies, and challenges for Hong Kong. *Chinese Education & Society*, *47*(1), 44–64. https://doi.org/10.2753/CED1061-1932470103

Mok, K. H., Xiong, W., & Bin Aedy Rahman, H. N. (2021). COVID-19 pandemic's disruption on university teaching and learning and competence cultivation: Student evaluation of online learning experiences in Hong Kong. *International Journal of Chinese Education*, *10*(1), 1–20. https://doi.org/10.1177/22125868211007011

Morgan-Thomas, A. & Dudau, A. (2019). Of possums, hogs, and horses: Capturing the duality of student engagement in E-learning. *Academy of Management Learning & Education*, *18*(4), 564–580. https://doi.org/10.5465/amle.2018.0029

Ni, A. Y. (2013). Comparing the effectiveness of classroom and online learning: Teaching research methods. *Journal of Public Affairs Education*, *19*(2), 199–215. https://doi.org/10.1080/15236803.2013.12001730

Ni, A. Y., Van Wart, M., Medina, P., Collins, K., Silvers, E., & Pei, H. (2021). A profile of MPA students' perceptions of online learning: What MPA students value in online education and what they think would improve online learning experiences. *Journal of Public Affairs Education*, *27*(1), 50–71. https://doi.org/10.1080/15236803.2020.1820288

Ofosu-Ampong, K. (2020). The shift to gamification in education: A review on dominant issues. *Journal of Educational Technology Systems*, *49*(1), 113–137. https://doi.org/10.1177/0047239520917629

People's Republic of China, Chinese Service Center for Scholarly Exchange. (2021, March 19). 关于新冠肺炎疫情期间留学人员学历学位认证工作的补充说明 [Supplementary explanation on the verification of foreign qualification for Chinese international students during the COVID-19 pandemic].

Rawat, S., Yan, Y., Wu, A. M., & Vyas, L. (2022). When public administration education switches online: Student perceptions during COVID-19. *Teaching Public Administration*. https://doi.org/10.1177/01447394221119092

Rifiyanti, H. (2020). Learners' perceptions of online English learning during Covid-19 pandemic. *Scope: Journal of English Language Teaching*, *5*(1), 31–35. http://dx.doi.org/10.30998/scope.v5i1.6719

Rodriguez, M. C., Ooms, A., Montanez, M., & Yan, Y. L. (2005, April). Perceptions of online learning quality given comfort with technology, motivation to learn technology skills, satisfaction, and online learning experience [Paper presented at the Annual meeting of the American Educational Research Association]. Montreal.

Roy, S. & Covelli, B. (2020). Covid-19 induced transition from classroom to online mid semester: Case study on faculty and students' preferences and opinions. *Higher Learning Research Communications*, *11*, 2. https://doi.org/10.18870/hlrc.v11i0.1197

Rushby, N. & Surry, D. (2016). *Wiley handbooks in education: Vol. 1. The wiley handbook of learning technology* (1st ed.). Wiley Blackwell.

Sahu, P. (2020). Closure of universities due to Coronavirus disease 2019 (COVID-19): Impact on education and mental health of students and academic staff. *Cureus*, *12*(4), e7541. https://doi.org/10.7759/cureus.7541

Sharma, Y. (2020, July 18). Disaster preparedness would improve HE pandemic response. *University World News*. https://www.universityworldnews.com/post.php?story=20200715113545432

Shek, D. T. L. (2020). Protests in Hong Kong (2019–2020): A perspective based on quality of life and well-being. *Applied Research in Quality of Life*, *15*(3), 619–635. https://doi.org/10.1007/s11482-020-09825-2

Stansfield, M., McLellan, E., & Connolly, T. (2004). Enhancing student performance in online learning and traditional face-to-face class delivery. *Journal of Information Technology Education: Research*, *3*(1), 173–188. https://doi.org/10.28945/296

Sutherland, G., Vazquez Corona, M., Bohren, M., King, T., Moosad, L., Maheen, H., Scovelle, A., & Vaughan, C. (2021). A rapid gender impact assessment of Australian university responses to COVID-19. *Higher Education Research & Development*, 1–15. https://doi.org/10.1080/07294360.2021.1971163

Taber, K. S. (2018). The use of cronbach's alpha When developing and reporting research instruments in science education. *Research in Science Education*, *48*(6), 1273–1296. https://doi.org/10.1007/s11165-016-9602-2

Tabvuma, V., Carter-Rogers, K., Brophy, T., Smith, S. M., & Sutherland, S. (2021). Transitioning from in person to online learning during a pandemic: An experimental study of the impact of time management training. *Higher Education Research & Development*, 1–17. https://doi.org/10.1080/07294360.2021.2010665

Taylor, L. (2022, March). Covid-19: Hong Kong reports World's highest death rate as zero covid strategy fails. *BMJ*, *376*(o420). https://doi.org/10.1136/bmj.o707

Urdan, T. & Cooper, P. (2019). *Taking education to students: How public universities have lagged online and What they can do to catch up. Solutions from beyond the beltway*. Manhattan Institute for Policy Research.

Vyas, L. & Butakhieo, N. (2021). The impact of working from home during COVID-19 on work and life domains: An exploratory study on Hong Kong. *Policy Design and Practice*, *4*(1), 59–76. https://doi.org/10.1080/25741292.2020.1863560

Yaghi, A. (2021). Impact of online education on anxiety and stress among undergraduate public affairs students: A longitudinal study during the COVID-19 pandemic. *Journal of Public Affairs Education*, *28*(1), 1–18. https://doi.org/10.1080/15236803.2021.1954469

Yan, Y. (2020). Making online higher education work: Opportunities, challenges and policy imperatives under COVID-19. *LSE COVID-19 Blog*. https://blogs.lse.ac.uk/covid19/2020/05/27/making-online-higher-education-work-opportunities-challenges-and-policy-imperatives-under-covid-19/