Perceived quality of online learning during COVID-19 in higher education in Singapore: perspectives from students, lecturers, and academic leaders

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Abstract
The COVID-19 pandemic has significantly affected the higher education sector in Singapore. Existing tertiary studies seeking to understand the intraperiod response to COVID-19 often focus on single institutions, jurisdictions or stakeholder groups. This study is the first in-depth qualitative multi-stakeholder examination of the higher education environment in Singapore during the COVID-19 pandemic. It explored the perceptions of the quality of digital pedagogy during COVID-19, how universities have adapted because of the pandemic, and how leaders, teaching staff and students have been affected by the management and educational changes via 13 semi-structured interviews across six Singapore higher education institutions. Through purposive sampling, we explore current stakeholder perceptions, structural education changes, and personal learning and teaching impacts of COVID-19. Applying Braun and Clarke’s approach to thematic analysis, we inductively uncovered four major themes: the Singapore government’s approach to COVID-19 and its effects on delivery; academic leadership approaches; education technology; and well-being. This article is critical as a key foundation to understand how Singapore is responding with unique geopolitical differences. We discuss the practical implications of our research for current university faculty and students during and beyond the pandemic, and outline opportunities for future research.

Keywords COVID-19 · Higher education · In-depth interviews · Singapore · Stakeholder analysis

1 Introduction
The novel coronavirus (COVID-19) pandemic poses significant challenges and opportunities for higher education (HE), with rapid expansions in emergent digital delivery strategies, globally. There have been three consistent intra-period responses (Bonk et al., 2020; Crawford et al., 2020). These include responding to minimum governmental...
regulations (e.g. physical distancing and reduced indoor gatherings), delayed commencement of the next teaching period and digitalisation. Rapid adaptation represents the first of four phases of profound organisational change within a pandemic context, proceeded by improvement, consolidation, and restoration (Butler-Henderson et al., 2020; Crawford, 2021a, b).

The research objective of this paper is to examine the quality perceptions of digital pedagogy in Singapore from three stakeholder perspectives: students, academics, and academic leaders. The quality of online learning refers to the impact of such formats on the quality of instruction, learning and participant interaction (Gómez-Rey et al., 2016; Rodriguez et al., 2008; Ward et al., 2010). Online learning encompasses both synchronous and asynchronous variations. There is an overrepresentation of emergent studies focusing on single institutions, jurisdictions, and stakeholder responses (for examples on Singapore, see Compton et al., 2020; Fung & Lam, 2020; Goh & Sanders, 2020; Kwan, 2022; Rai, 2020), despite growing calls for cross-cultural and cross-institutional studies (Bonk et al., 2020, Crawford et al., 2020).

This article is significant in its impact. It presents the first multi-stakeholder population qualitative research study (of students, academics, and academic leaders) across all three different types of institutions that provide higher education in Singapore: Autonomous Universities (AUs), International Branch Campuses (IBCs), and Private Education Institutions (PEIs) that offer transnational tertiary programmes. While the article focuses on one jurisdiction, the emphasis is on enabling depth of coverage through purposive sampling of diverse actors within the Singapore higher education sector.

This study complements higher education pandemic research that typically focuses on single-level studies (e.g. Flores et al., 2022; St-Onge et al., 2022). While these offer significant value, there is equally important context to be gained from a multi-level and multi-organisational study (e.g. Eri et al., 2021). In addition, our article complements an earlier study that explored the higher education landscape during the pandemic in Singapore and focused on case studies of educational institutions and their responses during the various phases of the pandemic, based on a content analysis of secondary data (Tan et al., 2022). Singapore provides a useful country case study, given the national focus on quality rather than quantity (Liu, 2021; Ng, 2008) which is in contrast to other countries’ massification agenda.

The pandemic affected Singapore’s higher education dramatically. Consequently, it is important to learn from the experiences of multiple stakeholders during the pandemic, when higher education institutions changed their operations. Specifically, three research questions guided our research:

Research Question 1. What are the perceptions of the quality of digital pedagogy during COVID-19?

Research Question 2. How have universities changed their operations to support rapid adaptation during COVID-19?

Research Question 3. How have leaders, staff, and students been personally affected by COVID-19-based management and educational changes?

To examine these research questions, we have organised this article in the following way. First, we begin with an overview of Singaporean higher education and COVID-19. Next, we describe and justify the method adopted for data collection and analysis. Finally, we synthesise the findings and consider the practical implications and opportunities for future research in our conclusions.
2 Background

Singapore’s higher education landscape comprises six local autonomous universities (AUs), eight international university transnational satellite campuses, and approximately 329 private education institutions (PEIs). The latter model ranges from ‘fly-in’ faculty with full control to models with complete domestic faculty. PEIs occupy a unique facet of the education sector with a limited proprietary offering under the regulatory supervision of the government’s Committee of Private Education.

The rapid adaptation response in Singapore was influenced by early detection and high sanitisation and social distancing efforts. In the first quarter of 2020, universities remained open, teaching either fully online or through blended learning approaches. In the second quarter of 2020, the rate of new infections increased alarmingly, especially among foreign workers staying in dormitories, leading to the announcement of a nation-wide lockdown to contain the spread of COVID-19 from 7 April to 1 June (Bonk et al., 2020). Prior to the lockdown (“circuit breaker”), universities began delivering learning activities online and redesigning summative assessments (e.g. invigilated examinations) into online and take-home modalities. After the lockdown ended on 1 June 2020, activities were planned to be resumed gradually over three subsequent phases: safe reopening, safe transition, and ‘the new normal’. At the time of writing (July 2022), the city-state continues to be in Phase 3. We provide a brief overview of these phases for context.

Phase 1 (‘safe reopening’: 2–18 June, 2020) saw the recommencement of low-risk economic activities. This included higher education institutions returning to campus for practical and laboratory-based sessions during existing teaching periods, with instructional learning remaining online. However, co-curricular activities, enrichment activities, and tuition were not to resume (Gov.sg, 2020). In Phase 2 (‘safe transition’: 19 June–27 December, 2020), some medium risk economic and social activities had resumed (Ministry of Health Singapore, 2020b). Phase 3 (the ‘new normal’: from 28 December 2020) is ongoing—but a return to Phase 2 was enacted between 8 May and 13 June 2021, as a result of increased infections—and will presumably end when COVID-19 ceases to be a public health threat. Among other things, Phase 3 involves the re-opening of Singapore’s borders.

3 Literature review

The literature on COVID-19 and higher education has been growing exponentially. Due to the novelty of the phenomenon, it is understandable that the bulk of the literature thus far has focused on single-institution and single-country studies (Authors et al., 2021). While the numerous institutional case studies usefully add to our knowledge on the pandemic, the downside of such piecemeal approaches is their fragmenting focus on specific local contexts. This could easily lead to a myopic perspective that misses the big picture (e.g. Bao, 2020; Karalis & Raikou, 2020). While single-institution studies were important in the initial stages of exploration, there is a genuine need to explore the pandemic’s impact on higher education more broadly as we seek to generate consensus and shared understanding. Some early works began to take national and international approaches (e.g. Jena, 2020; Toquero, 2020). However, these were not common and often lacked extensive rigour, likely due to time constraints.

Comparisons are important as they bring together disparate approaches to cohesive narratives. Comparing reminds us that the pandemic is not only an institutional problem, and
it enables us to learn from one another by adopting best practices and learning to continually improve them (Sahlberg, 2021). Four stages of pandemic response for higher education institutions are discernible: 1. rapid adaptation (“to rapidly adapt core business for the new context”), 2. improvement (“to optimise the adapted core business to improve quality and begin to consider non-core activities”), 3. consolidation (“to evaluate pre-pandemic measures of social, economic, and environmental success”), and 4. restoration (“to determine what a return to business-as-usual looks like, and how it can occur”: Butler-Henderson et al., 2020, Crawford, 2021a, b). A review of hundreds of articles up to December 2020 concluded that the vast majority of institutions were still at stage 1 (rapid adaption), with a minority of institutions being at stage 2 (improvement), an even smaller number at stage 3 (consolidation), and very few articles indicating that their institutions were at stage 4 (restoration).

The literature on COVID-19 has begun to extend to cross-cultural contexts (e.g. Connor et al., 2021; McGill et al., 2021), and some have even started to bridge the divide between rapid case-based publications and theoretical expose (e.g. Bartolic et al., 2021). One study began to synthesise sustainable blended teaching theory with the COVID-19 response (Petronzi & Petronzi, 2020) and another started to compare open innovation theory in the pandemic context (Tejedor et al., 2021). These studies are important as connectors between the pre-pandemic theoretical frames and the pandemic case study literature. The COVID-19 environment offered a research bubble within which we may better understand our students and staff in the intra- and post-pandemic environments (e.g. Tice et al., 2021; Yang, 2020). Prior to the pandemic, conversations of student experience (Mann, 2001), student well-being (Collings et al., 2014), and transformative education (Moore, 2005) were established and continued, along with many others. These conversations and knowledges need to be networked into the emerging pandemic literature database. Our manuscript continues with this line of inquiry by exploring the higher-education COVID-19 response in Singapore.

4 Methods

To address the research questions of this study, we adopted purposive (non-probabilistic) sampling, with the focus on getting a maximal variation (Patton, 2002) of voices, through the recruitment of four students, four academics, and five academic leaders (n = 13). Purposive sampling does not aim at being representative or being generalisable (Campbell et al., 2020; Yasmin et al., 2020), thus limiting its external validity (Andrade, 2021; Etikan et al., 2016). This research follows a practice of seeking data saturation (Boddy, 2016). In qualitative research, even a sample size of one (e.g. a longitudinal analysis of a CEO) could be meaningful and if sample sizes become too large, they do not permit in-depth analyses. Statistical approaches to determining sample size are more suited to deductive approaches in which themes are predefined and are not suitable for exploratory, inductive approaches in which sampling decisions are guided by saturation (Sim et al., 2018).

Purposive sampling is different from convenience sampling, as the latter draws its sample from a source that is easily accessible to researchers. In contrast, purposive sampling defines characteristics for a purpose relevant to the study (Campbell et al., 2020), such as in our case, students, academics, and academic leaders from different types of higher education institutions in Singapore. The sample frame was described as including no more than two individuals from an institution and that no individual occupied the same or equivalent role, so
that there would be unique voices from different academic levels. To this end, potential participants were approached one-by-one to identify individuals who did not have institutional or academic level overlap. Students, teachers and academic leaders (who also taught) were involved in the learning and teaching of modules in the disciplines of biology, business and management, chemistry, engineering, forensics, nursing, psychology, and Traditional Chinese Medicine. This was to ensure maximal variation between responses (Etikan et al., 2016).

Using semi-structured interviews, interviewees were provided guiding questions before the interview (see “Appendix 1”), and the research team used a conversational tone and were flexible in their questions and comments to remain open for serendipity during the interview (Fine & Deegan, 1996). The students were aged between 20 and 40 (75% female), with two full-time and two-part time students. The academics had roles including lecturer, senior lecturer, and adjunct professor (50% female). Among the leaders, there were one Dean, one Pro-Vice Chancellor, a Deputy Dean, a Vice President, and a transnational education Director (20% female). Academics and academic leaders were primarily in their 40s. The sample included respondents from two autonomous universities, two private education institutions, one international branch campus and two transnational universities.

All interviews were conducted virtually (via Zoom) between 21 July and 14 August 2020. We familiarised ourselves with the interview texts through transcription, repeated reading of the transcripts and initial ideas were consolidated and journaled down (e.g. recurring patterns, interesting quotes). Using Braun and Clarke’s (2006) thematic analysis method, two researchers continued with inductive coding and searching for themes against a pre-existing coding frame. Thematic analysis is a foundational method for qualitative analysis that identifies, analyses and reports patterns (themes) within data. It is a flexible and useful tool, as it organises and describes a data set in rich detail and helps interpret various aspects of a research topic (Boyatzis, 1998; Braun & Clarke, 2006). Through the journalling, examination, and careful definition and refining of themes, a final set of thematic codes emerged. The codes were sense-checked and continued to be reflected on to ensure accuracy prior to progressing. These codes exhibited emerging patterns and were gathered to form a mind map (see “Appendix 2”). The initial mind map consisted of seven themes comprising 32 sub-themes. Through an iterative analysis, themes were distilled to develop deeper context surrounding recurring phenomena and their manifestations (see “Appendix 3”). An illustration of the seven initial themes combined into four final themes is presented in Fig. 1. There were four final themes (the Singapore government’s approach to COVID-19 and its effects on delivery and assessment; managerial and academic leadership approaches; EdTech; and well-being) with 14 final subthemes, which will be discussed in the following section.

5 Findings

The following sections provide a summary of our student (S), academic (A), and academic leader (L) interviewees’ narrations and through verbatim quotations, we also let their original voices come to the fore. The presentation of authentic citations of what interviewees have said is a ‘gold standard’ in qualitative studies (Brown, 2010), as quotations bring content to life (White et al., 2014). Interspersed brief quotations signify richness of data, whereas lengthier extracts better represent extensive data and interviewees’ experiences (Eldh et al., 2020; Yin, 2015).
5.1 Governmental approach to COVID-19 and its effects on delivery

Governmental approaches to COVID-19 included social distancing, emergency remote teaching, evaluation of teaching and learning performance, preferences and comparison of delivery modes and assessments. In early April 2020, after seeing a spike in COVID-19 cases, the Singapore government announced a lockdown during which all residents (apart from ‘essential workers’ such as nurses) were strongly encouraged to stay at home. This ‘circuit breaker’ was implemented within a short period of time, with only a few days’ notice before the switch to emergency remote teaching (ERT) and remote working occurred. Academics were usually given some training to navigate through online learning platforms. In addition, technical support was provided to facilitate a relatively smooth and seamless learning experience. However, there were exceptions, when a student participant commented that “the university was very unprepared”, with
“a lot of emails coming in… every single day” with partially contradictory instructions (S2). Receiving these directives was confusing to this participant, as arguably, “both the students and lecturers were… put in a difficult spot” (S2). The student concluded: “the management was generally a huge mess” (S2).

Social distancing and the compulsory wearing of face masks were key governmental measures in preventing the spread of COVID-19, making face-to-face lessons unfeasible due to the one-metre minimum social distancing requirement. This led to the implementation of emergency remote teaching (ERT) and work-from-home arrangements. One academic participant identified their proposal to return to face-to-face teaching as resulting in hyper-cautious institutional responses:

Students are still going to be grouped into four but with social distancing… They will be 1.5 meters away from each other… They are going to use things like Google Drawings, Google Sheets to facilitate the entire discussion… We are going to do the face shield plus the mask. And we have a line that we cannot cross… I cannot cross and the students cannot cross… Students will sit there still for two hours, they cannot stand up and move around unless they want to go to the toilet. They cannot really discuss with each other. They will be in their masks, I’m gonna have my mask on plus a face shield for two hours (A4).

During ERT, many of our interviewees observed increased student attendance. Student feedback indicated fewer barriers to e-attendance (e.g. no commute). Interestingly, academics and higher education leaders observed similar academic performance levels when compared to face-to-face lessons. The perceived main difference between online and face-to-face delivery was that a higher level of motivation was needed from students to engage in online classes without getting distracted.

Our students recognise that while online is great, they don’t want a fully online experience, they value the interaction with their lecturer, they value the tutorials, the support that they get, and you can’t get that by going online (L2).

Despite the increased convenience of online learning, student participants preferred face-to-face classes “because it’s a more interactive learning experience” (S1), citing greater peer-to-peer interaction and more direct access to the lecturer. In contrast, educators and academic leaders tended to prefer either blended or online learning as an enabler of self-directed learning. For instance, one lecturer proposed that a “classroom session can be rationally reduced to one hour… or one and a half hours max”, with “more self-directed learning paths for students” and “grading for the self-directed learning so that students are motivated to do consistent readings every week” (A4).

Some of the academics who engaged in flipped classroom concepts prior to the pandemic faced fewer difficulties in managing the technological requirements of online learning. One academic leader described poly-synchronicity, with their educators needing “to poly-synchronise to teach both remote students and face-to-face students in the same class” (L3). They defined poly-synchronicity as “looking at multiple modes, in order to enrich the student experience”. With the eventual resumption of face-to-face delivery, they envisaged the following scenario:

If I finally have a class where students can talk to one another, they can also relate to somebody online. We could have guest lecturers coming in, we could use... AR [Augmented Reality], VR [Virtual Reality], using different modes to enrich student experience (L3).
In response to potential student anxiety from governmental learning and teaching requirements, some academic leaders amongst our interviewees articulated a temporary simplification of their grading systems to satisfactory/unsatisfactory, in one case only for the first two years of study. Another retained the grading system, but excluded subjects completed during 2020 from student Grade Point Average (GPA) computations: “if for whatever reason...you’re not successful... that grade will not be counted in your GPA, will not be reflected in your transcript and will be counted as withdrawn without penalty” (L3).

Some leaders reported on amendments to assessment designs including take-home examinations and proctored oral and written online examinations. Others reported pauses in examination delivery. Online examinations led to academic integrity concerns, with one academic leader commenting that “there was cheating”, although “99.9% of the students followed the rules” (L4). The implementation of lockdown browsers and the taking of random pictures every few minutes could not completely address isolated cases of academic offences. One academic leader shared that his University tried.

...to steer unit coordinators away from using exams in some circumstances where we don’t think they are appropriate... I think that’s been good because it’s caused some of our academics in [home campus] to really rethink what they’re trying to achieve. How are we trying to test your knowledge, how are we trying to examine the learning objectives? And maybe a single timed exam is not the best way to do that (L1).

Another leader shared the difficulty of demonstrating practical procedures without access to technical equipment and partners. Instead they developed an in situ ‘mannequin’ (“Wilson” from the movie Cast Away – see Fig. 2) during a workshop to demonstrate creative responses to students.

I... built a mannequin out of pillows, a football shirt and a hat... I took a picture of it to say ‘Look, we have to be imaginative here as to how we could actually do an assessment’... It was treated as a joke at first. If it comes to the end of the day, the student might have to show us on a teddy bear or a mannequin... how they would conduct this assessment and what they would do (L4).

5.2 Managerial and academic leadership approaches

Emergency remote teaching (ERT) meant that new protocols had to be adopted. This theme considers challenges faced, opportunities gained, and user experiences by multiple stakeholders (students, academics, academic leaders). ERT necessitated rapid deployment of additional EdTech resources, IT support, and professional development needs to enable online teaching. One academic participant praised their EdTech team response:

‘Do you need microphones, what would you need to be working from home? We can send that to you’... They really did their best. And when we were actually administering the exams and the assignments..., they also provided immense support for it and they were present to ensure that everything goes smoothly. So I think on that level, the education technology team, they really did well there (A1).

Apart from ensuring that stakeholders had adequate resources, IT managers had to ensure students’ safety while continuing learning and engagement. Opportunities as a result of the pandemic include an increased knowledge about, and more practice in, e-learning and EdTech functionality. The interviews illustrated that pre-pandemic,
Singaporean educational institutions engaged primarily in traditional face-to-face delivery. After the rapid adaptation of online learning and teaching, interviewees commented on the benefits of e-learning: decreased time and cost spent on transportation, and increased flexibility and time. One student participant expressed her surprise that she “survived this whole semester through online class” and actually enjoyed it, for time- and cost-saving reasons (S4), while an academic participant concurred that he found it easy to have back-to-back lessons” with “a half an hour break” in-between (A2). Morning classes were less arduous: “you can slowly take your breakfast, prepare everything and then come for lessons” (A2). Student participants commented on the benefits of watching lectures asynchronously, 24/7, and considered enrolling in Massive Open Online Courses (MOOCs). One student participant did not attend the ‘live broadcast’ and preferred watching the webcast uploaded by the lecturer: “these online lectures are probably like two-hours lectures and I usually take five hours to go through them as I would rewind and re-watch, therefore taking up a lot of time” (S2).

While one academic leader envisaged a pure online delivery as a new option for Singapore-based students, another envisaged venturing into higher education-underserved emerging economies:

If you had almost like a workspace, where you had a really reliable internet where students in say, Laos could come to that centre, ...they could be taught with big screens and cameras… by academics from Singapore..., but at [a] much lower cost (L1).

Student participants had generally positive feedback on the management during ERT, lauding that they were clear in their instructions. In terms of the learning experience, students provided feedback that many lessons were less interactive and expressed their displeasure about incidents during breakout groups where their peers (named “zombie students” by S4) did not participate in discussions. Most academic participants felt that online learning
allowed flexibility but provided less interaction with, and among, the students. One academic participant lamented: “I don’t really get to know my students that well…. I don’t see their expression most of the time” (A4). Academic participant feedback throughout ERT was that management was supportive and provided ample resources to make sure classes went without major disruptions. For instance, one academic commended the academic support team of her university:

The Education team… kept emailing me to ask me what kind of support I needed…. They did the best they could, they provided us with all the links and accesses and tutorials for Microsoft Teams, Zoom, Google Classroom… and would say ‘these are things that you can use, see if it works for your class’ (A1).

Academic leader participants uniformly thought that the pandemic led to accelerated adoption of EdTech and digital pedagogy. Consistency in user experience across all stakeholders, such as ease of use and functionality of EdTech tools, was commented as a concern. Some interviewees had difficulties finding items on a Learning Management System (LMS) page as resources were not curated to effectively support a uniform user experience across different subjects and courses.

5.3 Educational technology

During the lockdown, all educational institutions needed to adapt to remote learning and teaching, which vastly accelerated the use of educational technology. Primary comments from participants discussed EdTech tool usage and their perceived benefits and costs. Participants reported on different EdTech tools including online platforms (e.g. Zoom and Microsoft Teams), learning management systems (LMS: e.g. Blackboard Collaborate), learning tools (e.g. Miroboard), online testing applications (e.g. Respondus) and anti-plagiarism software (e.g. Turnitin and Ouriginal).

Participants consistently articulated that the unstable Internet connections disadvantaged some students and reduced interaction. One academic shared that “the only thing that stresses me out online sometimes is the wi-fi issues” (A3), while another observed that especially students logging in from other Asian countries often faced poor Internet connectivity: “the internet is very bad… Most of the time they are disconnected” (A2). With many students hesitant to switch on their video cameras, non-verbal communication by students has become much more limited. This ‘non-visibility’ can also inadvertently actuate unresponsiveness.

Sometimes, because of the barrier between the screen and students… especially if sometimes the screen goes blank and then you do not know what someone is doing, perhaps sleeping, …you have to have a bit of patience and grit to just get through and motivate people from behind the screen (A3).

Interviewees also identified disadvantages such as higher utility bills and Zoom fatigue. For example, one academic leader who also had a heavy teaching load complained:

Staring at screens for eight hours a day or more is not good… I’ve been on the weekends as well. So it’s Saturday, 9am until 6pm. And then Sunday, 9am to 6pm. And then…, social life is also online. Oh, there’s like no respite from it to a certain extent (L4).
Participants also reported on e-learning benefits that included increased flexibility while working or studying from home, decreased commuting, greater opportunities to learn, and facilitating greater student responsibility for their self-directed learning. Academic participants articulated that students were more willing to be challenged and interact with their peers/lecturers using e-learning tools. For instance, polls “at the end of the lesson” were found useful to “see if there’s a difference in understanding or opinion” (A3). E-learning has also led to increased innovativeness in problem-solving capability across all participants. One of the academic leaders who is also actively teaching saw some of the problems posed by e-learning as a “well-disguised opportunity”. While pre-pandemic, students prepared a sketch “like a proper drama thing” (L5), this turned out to be “too difficult” online. They decided to turn the problem into an opportunity by giving the students:

a little bit more for my unit. I decided to invite people from around the world... to give a one hour... chat. So we started with who they are, what they do and then we had an open conversation with students, sending their questions in the chat, getting to know the expert and asking questions related to the unit... These are people that are in my network... It was great because one of these, for example, is the protagonist… of… [a] Netflix series... So, having the expert on Netflix that you will never meet, but he’s there chatting with you, it’s a great experience for the students... I will probably not... do that if not for... COVID... So the unit is still a good unit (L5).

5.4 Well-being

Students, academics and academic leaders were forced to adapt to the disruption of the pandemic in a short period of time. Our research found that this impacted individual well-being. We noticed that participants were physically, psychologically, and socially affected. For physical factors, academic participants reported increased workloads from online redesign and increased marking time (compared to hardcopy). Fatigue and strained eyes from looking at screens for extended periods of time were commented on. One academic remarked that her home had not been set up for work and not having “a desk at home”, she, “for the first two weeks, … worked standing up on the window bench”, thus developing “back pain” (A5). Work-life balance was recognised as a challenge, leading to some participants overworking to the detriment of their physical selves. One academic shared her and her academic team’s physical issues that had been caused by the excessive online work:

Our eyes are very painful. I just got myself the blue light glasses... I’m using this now when I actually do my marking... because by the end of the day, after my Zoom classes and my meeting here, my eyes are red and I tear, so it’s really bad... A lot of instructors complain about the same thing... Some even get very bad headaches (A1).

The same participants also commented on affected mental and emotional states, such as experiencing burnout, stress, and anxiety from excessive workloads: “there’s a lot of extra work for instructors... I could see by the end of it, that they were all burned out” (A1). Reduced face-to-face interaction seems to have contributed to feelings of loneliness. One academic shared that “it’s really easy to go down a rabbit hole these days” and that she “was home alone, …feeling lonely” (A5). All academic leaders commented on their concern for staff and student well-being, for instance:
I should… touch on… student hardship, economic hardship, where we’re seeing a spike in mental health issues among our students which is really quite worrying. So we need to do more on that front… Also the mental health of our staff as well as… their wellbeing, ...I’m trying to focus a lot more on that. It’s very difficult, we’re all working from our homes… with all the stresses and strains of trying to deliver a quality experience for our students... We need to really… be mindful of everyone’s mental health…, that’s really important (L1).

However, some student participants thrived online. One observed that online learning was beneficial through increased flexibility. One of the students was a mother of four who, pre-pandemic, had occasionally been unable to come for classes due to parental responsibilities. In one academic leader’s observation, some students love the convenience, the flexibility, but they also like the anonymity, they can sort of be lurking in the background listening but not necessarily fully engaged or participating... Some people are cooking dinner, some are looking after kids. One guy even… popped out of the shower. So people are sort of getting on with their life while they’re taking a class, which is interesting (L1).

Operating remotely affected the social lives of participants due to the lack of face-to-face human interaction. On a positive note, this has strengthened familial relationships as some participants cited that family support aided them coping with uncertainty. However, while our interviewees felt fortunate to have family support, one academic also reflected on increased domestic violence concerns: “Now you’re home with people you don’t want to stay with… I’m a forensic scientist. I face many cases of homicides of women…, I know that small spaces can make people go crazy, on top of this adding kids, adding workload, adding deadlines” (A5).

The economic turmoil brought about by the pandemic caused a financial reevaluation in several higher education institutions, with staff remunerations as well as hiring frozen, as well as decreased bonuses. There were concerns about job opportunities and job security. Some of the interviewed academics also expressed concerns over staff promotion as they anticipated student evaluations to be less positive than usual, given some students’ resentments towards online learning. However, one academic leader noted that higher education is a relatively resilient sector.

**6 Discussion**

Interviewing multiple levels of stakeholders, while not a new concept, is considerably new within the COVID-19 context. In this study, the results offered confirmatory and conflicting sentiments with some existing knowledge bases. While there was consideration to the external environment’s influence on participants’ ability to learn and teach, the focus remained on understanding what immediate responses could look like. Likewise, there were instances of ambition and conservatism to change, and some taking a forward-looking approach to view the opportunities beyond the pandemic.
6.1 External pressures to perform

The pandemic created a new wave of external pressures for those in Singapore. There was a genuine need for social distancing, hand sanitizer regimes, face masks and lockdowns from the first suspected case on 4 January 2020 (Ministry of Health Singapore, 2020a). That need created diverse governmental responses globally, but saw Singapore act early with strong restrictions. This meant for many academics and students that there was a distinct temporal difference between support mechanisms and established best practices for emergency remote teaching, when Singapore education went online. The requirement for response, therefore, was predicated on assumptions of how to engage in online education during a pandemic rather than effective learnings from others. From the 2nd of January 2020, temperature checks for international visits were conducted; schools had one day of home-based learning from 27 March; and graduation ceremonies were cancelled from 6 April (Tan et al. 2022). The first peer-reviewed papers were not published until 20 March (Bao, 2020), and 1 April (Bonk et al., 2020; Crawford et al., 2020). This imbalance between available pedagogical evidence at the time created significant challenges and pressures for educators commencing and charting new territory.

For educators in our study, this created significant rates of stress comparable to Goffman’s presentation of self (1978). Bullingham and Vasconcelos (2013) theorise that individuals adapt their presentation of self in their online identities as another facet of self. For students, this manifested in nervous apprehension regarding how their personal life blended with their study life or engaging in emotional labour (Grandey, 2000), rather than focusing on learning outcomes within the digital environment.

6.2 Risk and reward

For some academics, there was an appetite to engage in risky learning and teaching delivery to support student success. For example, Wilson the Mannequin (Fig. 2) appeared to deliver a return on investment for the education process. However, there were likely many failings to deliver effective learning outcomes for students. For instance, a hacking event within one university led to a Zoom session showing pornographic materials (Baharudin, 2020). Occurrences such as these create an impetus to be conservative with new educational technologies, despite the potential benefit they may provide to students in their online learning. Academic leaders interviewed spoke to the nature of support systems required to enable psychological safety and ownership to act (Dawkins et al., 2017; Edmondson & Lei, 2014). Those organisations that supported their staff to engage safely were more prepared in delivering on their educational ambitions during the pandemic.

Students interviewed were also in a similar position, with a view to engage in online education slowly. The ‘ghost’ student with their camera off and microphone muted in the Zoom classroom comes to mind here. These types of student interactions are not new (Olt, 2018), although traditional face-to-face educators are less familiar with pedagogical responses to support this type of inclusion. These new social conditions for primarily on-campus students add perceived emotional and psychological risk to their engagement. Indeed, such engagement could include showcasing components of their personal identity they reserve sharing in learning environments (e.g. posters on their bedroom wall). Some scholars have drawn on the technology acceptance model to explain how students navigate unstable internet connections and new online learning environments (Alfadda & Mahdi, 2021).
6.3 A post-pandemic orientation

The pandemic has created much reasons to experience lower mental health, physical health, financial security and perceived quality of education (Abushammala et al., 2021). Despite these challenges, while overwhelming at times to participants traversing the new landscape, there was a general sense of optimism for what the future may hold. Butler-Henderson et al. (2020; Crawford, 2021a, b) discuss the need to reflect on the pre-COVID-19 education environment and draw on the current education climate to imagine a new future for higher education. This rhetoric was consistent with the participants in this study. Students, educators, and leaders uniquely highlighted the challenges and the opportunities they were presented. While there were definitive challenges for every student to be involved effectively in their higher education environment, there were calls for new forms of education beyond the pandemic that leveraged our new ways of working, learning, and living. In many ways, the pandemic acted as an accelerator of a transition that may have happened in the distant future for the higher education sector; a signature student-centred pedagogy based on principles of authenticity, flexibility, and innovation.

7 Conclusions

This study is the first in-depth qualitative multi-stakeholder examination of the higher education environment in Singapore during the COVID-19 pandemic. It explored the perceptions of the quality of digital pedagogy during COVID-19, how universities have adapted because of the pandemic, and how leaders, staff, and students have been affected by the management and educational changes. The study identified four themes: (1) the Singapore governmental approach to COVID-19 and its effects on delivery and assessment; (2) managerial and academic leadership approaches; (3) EdTech; and (4) well-being. The government approach to COVID-19 impacted higher education, through their policy on social distancing, emergency remote teaching, evaluation of teaching and learning performance, preferences and comparison of delivery modes, and assessments.

As Singapore’s higher education landscape consists of both local and private institutions and international transnational university campuses, the response from the university leadership was not only impacted by the government response, but also the university policy, which for eight of the institutions were also reflective of the main university in another country. While many of the sub-themes in the managerial and academic leadership approaches theme related to technology, it was the actualisation of leadership in management and academics to respond with agility that augmented the responsiveness of policy to support staff and students. Similarly, the responsiveness of educational technology, across the areas of capabilities, technology and connectivity, either enhanced or inhibited the transition to online teaching (e.g. Alghamdi, 2021). Lastly, staff and students were physically, psychologically, and socially affected by the pandemic’s impact on teaching and learning. Mental health and well-being were affected by shifts in work-life balance, isolations and lockdown and the economic impact of salary.

Higher education institutions in Singapore, and globally, have an important opportunity to learn from this research and to ensure the next national or global event is managed in a more planned and proactive approach, putting the socio-cultural needs of those individuals within the system first. This also includes considering how technical infrastructure has the capacity to be flexible to create a transparent and rigorous approach to any
technical challenge, and curriculum mapping may support this (e.g. Cooper et al., 2021). This research is significant as a foundation for emerging works that seek to go beyond the single-institutional case study and towards a positive global conversation around post-pandemic higher education futures. We believe there is an opportunity to reimagine higher education, and this work should serve as a critical foundation to that. Future research is also required to evaluate the long-term impacts of government and institutional leadership policy on educational technology and well-being. There are multiple opportunities for future research that may include some from the following, non-exhaustive list: mixed-method and quantitative research studies on Singapore’s higher education landscape during and beyond the pandemic; studies using different research paradigms that focus on selected aspects of Singapore’s higher education (e.g. leadership, teaching & learning, educational technology, student well-being or changes in assessment); cross-country comparisons that compare Singapore’s higher education institutions with another country (e.g. Butler-Henderson et al. 2020; Crawford, 2021a, b), and multi-country comparisons that involve Singapore (e.g. Bonk et al., 2020; Crawford et al., 2020).

Appendix 1: Semi-structured interview questions and research question alignment

RQ1

- How has it been for you since the start of the Circuit Breaker?
- How would you rate the effectiveness of online classes?
- What is the student feedback that you have received thus far on their experience?
- How would you describe the main difference between online and F2F teaching?
- Do you have any preferences when it comes to online / F2F / blended learning and teaching?
- Have you encountered any new opportunities / challenges as a result of the pandemic?

RQ2

- Could you please reconstruct for us how your university reacted to the pandemic?
- What has your university / PEI done thus far in terms of online classes, delivery and assessment?
- Have you encountered pressures to save cost?

RQ3

- Q6 Please tell us how you have been affected by COVID-19?
- Q8 How is your own experience teaching from home?

ALL

- Q12 Is there anything else that you would like to discuss?
Appendix 2: Initial mindmap of themes
Appendix 3: Final mindmap of themes

Perceived quality of online learning during COVID-19 in higher education

Challenges:
- Onsite learners gain more knowledge than offline
- Technical challenges
- Tedium online teaching processes
- Between online, F2F & blended
- Flipped classroom
- Group teaching
- Transition
- Online to offline and vice versa
- Self-directed learning
- Anti-lecture
- Smaller class size (F2P)

Grading, SEnAcademic safety net (ASEN)

Preparations

Between online, F2F & blended

Preferences

Delivery

Performance: Increased attendance, grades (scale 1-10)

Evaluation of teaching and learning performance

Design:
- Online platforms used (Zoom, Microsoft Teams, Google)
- Teams/SharePoint/Blackboard/BigBlueButton
- LMS
- Blackboard
- Recording of lectures
- Learning Tool
- Micro-Teaching
- Anti-plagiarism Software
- Turnitin
- Responsiveness (lockdown browser)
- Virtual Simulation

Assessments (formative/summative)

Academic Identity

Governmental Approach to COVID-19 and its effects on delivery

Thematic Analysis

Managerial and Academic Leadership Approaches

User Experience

Challenges

Opportunities

1. Reduced cost of delivery
2. Enabling functionalities
3. Acceleration of technology in delivery experience

1. Maintaining student learning (engagement) while ensuring their safety
2. Campus experience not achieved
3. Increased need for resources (monopoly)
4. Improving virtual learning environment for online learning
5. Working within government restrictions
6. Increased IT resources

Legend
Green - Well-being (RQ 3)
Pink - Governmental Measures/ Delivery (RQ 2)
Blue - Management
Red - Responsive students Unstable connectivity
Lack of interaction
Group work (shirking)
Zoom fatigue
Limited access
Increased use of personal utilities
Technology competence
Miscommunication
Disconnected online work
Student engagement (loss of)
Lack of amenities
Decreased resources

Flexibility
Decreased commuting
Opportunities to learn
Self-directed learning
Interactivity
Innovative Problem-solving
Learning to learn
Student-centric learning/teaching
Acceleration of technology
& learning

Mental health/Anxiety
Brain dead
Emotional strain/ well-being
Loneliness from isolation
Staff well-being
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