Managing and responding to pandemics in higher educational institutions: initial learning from COVID-19

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Abstract
Purpose – The purpose of this paper is to understand the key challenges, approaches and lessons of the higher educational institutions (HEIs) in the context of COVID-19.

Design/methodology/approach – A survey was conducted to understand the key challenges being faced by the HEIs around the world during the ongoing COVID-19 pandemic. A total of 150 responses were collected from 65 universities, located in 29 countries.

Findings – The results show that 47% of respondents with defined universities believe their institutions lacked a permanent or dedicated emergency management office, and 41% said their HEIs lacked a general business continuity plan for an emergency. In universities with BCPs, 33% of the plans do not cover biological hazards and pandemic risk management, and 60% of the plans did not include conducting any advanced simulation exercises. More than 70% responded said their instruction, information sharing and decision-making process were timely and open. The major challenges identified were a lack of adequate preparedness for pandemic and of pandemic-specific advanced simulation exercises. The next major challenges were the change in the mode of teaching to online lectures and working from home. Based on these challenges, a set of short- and long-term recommendations were proposed.

Originality/value – This was the first survey in academic institutions in post COVID-19 context. The findings will be useful for preparing for biological and other related hazards.

Keywords COVID-19, University responses, Online classes, Shifting academic calendar, Community and local government collaboration

Paper type Research paper

1. Introduction
Coronavirus disease (COVID-19) was first reported in Chinese city of Wuhan in December 2019, was recognized by China as a new virus in the third week of January 2020. The World
Health Organization (WHO) initially described it as a Public Health Emergency of International Concern (PHEIC) at the end of January, and finally recognized it as a pandemic on March 11, 2020 (WHO, 2020). Chronology of events in China, East Asia and several other countries have been discussed in recent publications (Hua and Shaw, 2020; Shaw et al., 2020 and reference therein).

Currently, the USA has the largest number of infected people and death, and all these factors have made COVID-19 the worst pandemic in recent years. Shaw et al. (2020) identified the following characteristics of COVID-19:

- rapid spread;
- heightened vulnerability among aged and low immune people; and
- differential recovery rates in different countries and age groups.

In the interconnected world, the pandemic has not only affected lives but also had a strong impact on various sectors. The education sector is among the most frequently impacted service sectors from the pandemic, having already experienced SARS and MERS. The main reason for this is the closure of schools and universities, which disrupts the academic calendar and causes stress to parents and students alike. In response, many educational institutions have started offering online classes/courses and some have shifted their academic calendars to cope with this extraordinary situation.

Understanding this as the “new normal” while also thinking of possibilities for future pandemic or biological hazards and their impact on the higher educational institutions (HEIs), this paper highlights the challenges that HEIs face in starting or continuing their courses and conduct research. The purpose of the paper is to understand and learn from lessons from the responses of different universities to deal with the COVID-19 and share the lessons widely.

2. Higher educational institutions and disaster preparedness

2.1 Major issues that higher educational institutions are facing

The COVID-19 disease made a significant impact on HEIs mainly in two areas:

1. shifting a major educational form from a face-to-face to online; and
2. tackling the financial challenges.

Shifting in education from traditional classroom learning to online-based learning created tremendous changes for both lecturers and students. A survey conducted in India targeting 200 students showed that 74% of the respondents liked studying through online classes. Its most common reason (49%) was the flexibility of the study time. On the other hand, the biggest drawback of online classes addressed was a lack of co-curricular activities in the online education, followed by not meeting friends (Lall and Singh, 2020).

While such positive side of online-based learning has been reported, De Oliveira Araujo et al. (2020) emphasized the negative impact of the COVID-19 on students’ mental health. Many students face anxiety and panic owing to the numerous implications for courses, assignments, seminars and thesis defenses (The Guardian, 2020). In addition, lack of self-discipline, suitable learning materials, or good learning environments were serious issues when they are self-isolated at home (Bao, 2020). The effectiveness of the online learning is also an issue in a country such as Singapore that started to embrace the use of digital platforms to facilitate teaching and learning nearly ten years ago. Some students found out that they were more easily distracted during a lecture by doing an internet surfing or talking to friends on messaging applications without any repercussions. Even though digital tools
can add values to teaching and learning and online learning has become an important part of university education, going fully online is not the best long-term plan and plays a complementary role (Tan, 2020). Blended learning models could be a mainstream and take over as the norm in the future learning and education.

Another significant issue that many HEIs have faced is the financial challenges. These concerns extend to the financial future of HEIs such as considerable financial instability, both in the form of unexpected costs and potential reductions in revenue, i.e. owing to cancelation of enrollment of both domestic and international students and refunds on fees, room and board and the need to scale virtual engagement modalities (The NCSL Podcast, 2020; Rosowsky, 2020). The global economic recession puts a great impact on the HEIs’ financial management and operation. To survive in these difficult times, leadership will need to prepare for numerous possible scenarios, seek creative solutions and stay flexible in the face of continuous change (Deloitte, 2020).

2.2 Overview of emergency preparedness/management plans in higher educational institutions

Most, if not all, universities develop guidelines that detail how to prepare for and respond to emergencies in the form of “Emergency Management Plan (EMP),” “Emergency Response Plan,” “Crisis Management Plan,” “Business Continuity Plan (BCP)” and others; however, the key information included in these plans have common elements. The major part of most documents consists of a description of the roles and responsibilities of specific offices, departments and divisions and the structure of the incident command mechanism for emergency responses. In addition, some EMP also include a summary of the risk assessment and mitigation strategies. Most of the plans have two approaches in common: an all-hazard approach and four phases of emergency management, namely, preparedness, response, recovery and mitigation (University of Sydney, 2016; University of Auckland, 2013; University of Houston, 2020).

In these plans, emergencies are considered events that can cause death or significant injuries to staff, students, or the public. No further detailed definition is included on the types of incident categories (University of Auckland, 2013), nor on which incidents can suspend business, disrupt operations, create significant physical or environmental damage, or threaten the university’s financial standing or public image (University of Otago, 2018). In principle, different types of hazards such as natural, biological, technological chemical, man-made attacks are the targets of an emergency/crisis management plan. However, depending on the type of frequent hazards in each country, their emergency management could have a different focus.

Because of the unique circumstances of university campuses, no one plan fits all templates applicable to all educational institutions. Campuses have to develop an individualized plan based on the specific threats and vulnerabilities that they face Kapucu and Khosa (2013). However, Zdiarski et al. (2007) provide guidance on a possible common template that includes the following:

- clear lines of authority that create a hierarchy of roles that lead to the campus president;
- action steps that give campus officials the roadmap of what to do depending on the nature of a crisis;
- established communication methods including a communications center that will ensure effective information exchange; and
For HEIs, it is crucial to consider continuity of campus operations such as teaching, research and other auxiliary services and develop a BCP. As suggested by Zdiarski, a BCP is ideally a part of the management plan. Some universities have documents called “Emergency Management/Response and Business Continuity Plan” (Lamar State College, 2013; Pace University, 2014); however, many universities have a BCP that is separate from an EMP.

The intended purpose of BCP is to ensure business continuity, that is, to provide a detailed methodology governing how business is restored after a disaster, including for local incidents such as building fires, regional incidents such as earthquakes or national incidents such as pandemic illnesses (San Jose State University, 2020). Alternatively, some BCPs include the basic policy and procedures for initial response, business recovery and campus reopening in the event the university encounters a situation in which continuation of business activities becomes difficult (Waseda University, 2019). One of the characteristics of a BCP is that its development is often a responsibility for each department, and universities provide the template for a BCP document (Pace University, 2014; California State University, Los Angeles, 2019). Most BCPs are developed by academic departments or divisions and not by universities.

To conduct further research on a BCP or an EMP, the limitation and challenge is that not all the documents are open to the public, or some of them were written in the local language and English translated copy is not available; therefore, it is not easy to find these in an online search. At a result, it is extremely challenging to perform a detailed and specific analysis of the prevalence of an emergency plan and BCP in general in higher education settings.

A BCP and an EMP often take an all-hazards approach; however, some have focused on particular areas. The EMP developed by the University of Otago (2018) in New Zealand particularly includes a section of special provisions relating to pandemics/epidemics. The section consists of the following:

- a pandemic planned response; and
- pandemic communications.

Furthermore, a more specific BCP is dedicated only to pandemics. The pandemic influenza BCP of Massey University (2009) states that the motivation and reason for developing such a BCP is that the risk of an influenza pandemic is high, and the pandemic is certain to occur.

The document has also indicated that “social distancing” serves as one of the “containment activities” through people avoiding face to face meetings and classes; using virtual meetings/classes and conference calls; avoiding unnecessary travel and canceling or postponing non-essential meetings; studying/working from home or flexible hours; and avoiding all public transport. The reality is that many faculty and students are finding it difficult to adjust to the shift of the mode of education delivery, as it has never been expected; however, the university has already warned that these are the activities to be taken in case of pandemic.

California State University, Los Angeles (2019) has developed a pandemic BCP because pandemics can last long, can occur in the form of multiple events or waves and can disrupt every phase of every one’s lives – goods, services and transportation are all affected by delays to total shutdown. Therefore, the impact on universities will be enormous unless they are well prepared. The plan also suggests “Alternative methods to deliver services and classes” assuming the teaching system needs to be changed. As an alternative, it
recommends using the learning management system for the courses, which is a type of e-learning.

One of the obvious post COVID-19 phase work should be to initiate a comprehensive review of BCPs/EMPs to get a realistic understanding of what worked and what did not and how current practices could be improved. If they worked, it might be asked whether each university should develop a BCP/EMP that focuses on different hazards/disaster types such as biological, chemical and natural disasters, or whether an all-hazards approach would be sufficient to cover different types of hazards.

2.3 Initiatives for creating a safe campus

To understand the level of disaster preparedness on campus including the existence of a disaster management plan at the university level, a survey was conducted in 2015 by the Association of Pacific Rim Universities (APRU) Multi-Hazards (MH) program. APRU is a network of 55 universities from 19 APEC economies in the Pacific Rim. Under the APRU, the MH program was established in 2013 and is led by Tohoku University in Japan. One of the major program activities is to support universities’ disaster preparedness by conducting a survey and research on campus safety and organizing a biennial workshop.

The survey focused preparedness only for natural hazards. The survey showed only 45% of the respondent universities conducted a risk assessment, and out of the 45%, only 36% used the result of the risk assessment to discuss how to strengthen their risk management and/or mitigation strategies. Risk assessment and related information sharing were addressed as the biggest shortcoming on campus safety issues, and the major challenges were the lack of collaboration in universities, budget, awareness and human resources to enhance the disaster preparedness capacity on campus (APRU, 2015).

Even among the APRU member universities, conducting a risk assessment and sharing information targeting natural hazards was one of the challenges. If so, the risk assessment for all hazards could be a significant burden for universities. However, the concept of an “all-hazards approach” has been advocated for many years especially in the USA and Europe (Baucher et al., 2018; FEMA, 1996). The need for this approach in Asia, which is the most disaster-prone area in the world will be high; however, the implementation level is still low. In the post COVID-19 phase, universities in Asia must seriously mainstream disaster risk management in their strategic and operational planning.

3. Covid-19 impacts on higher educational institutes

This study aims to understand the key challenges being faced by the HEIs around the world during the ongoing COVID-19 pandemic. The major findings of this study are derived from data collected with an online questionnaire survey that was conducted during April 10–27, 2020. The questionnaire was widely circulated among universities and research institutions through reliable networks such as APRU, the Integrated Research on Disaster Risk, the UN Office for Disaster Risk Reduction and the Asian Universities Network and was answered by 150 people from 65 universities, located in 29 countries, who belong to teaching and research professionals. This was specifically significant for the Asian universities, most of which have a semester starting from April. Thus, the initial challenges for the start of the seminars were captured properly.

3.1 Research methodology

A mixed research method combining qualitative and quantitative data was used to collate data. The process is as described below:
The first step aims to understand the organizational preparedness and response. Toward this end, information about disaster management and/or business continuity planning alongside the operational aspects and roles of disaster/emergency management unit or sections were sought from HEIs. Organizational response was collated through specific questions about response guidance, information sharing and decision-making in the HEI's in relation to COVID-19. Tables 1 and 2 provide details of the questions asked. The analysis was made at the organizational level based on the number of universities, not number of respondents. This is because, in some cases, there was more than one respondent from a specific institution. In case where multiple responses were received from one university, it was counted as one response only if all the responses are the same. In case where the answers are different, the responses were not analyzed.

The second step was to ascertain if there is a relationship between organizational preparedness and the organizational response determinants. The study results (Yes/No coded to 1/0) were analyzed using a Peraman’s correlation matrix that was developed using the IBM SPSS statistical software platform, The Speraman’s correlation technique was specifically selected owing to the nominal data (Yes/No) derived from the study.

The third step aimed to derive the key preparedness lessons and make recommendations for future pandemics and biological hazards based on the response activities taken at the organizational and personal levels and the challenges experienced COVID-19. Table 3 highlights the survey questions created for these purposes.

### 3.2 Key results and observations

A total of 150 responses from more than 65 universities located in 29 countries were received for the online survey. Majority of responses (75%) received were from the Asian region. The

<table>
<thead>
<tr>
<th>S.No.</th>
<th>Key determinant and question</th>
<th>Scale</th>
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<tbody>
<tr>
<td>1</td>
<td>Emergency management unit: Does the emergency management office exist permanently in your university?</td>
<td>Yes/No</td>
</tr>
<tr>
<td>2</td>
<td>Business continuity planning: Has your university had a general BCP to prepare for an emergency?</td>
<td>Yes/No</td>
</tr>
<tr>
<td></td>
<td>(a) If yes, does this BCP also target a biological hazard/pandemic?</td>
<td>Yes/No</td>
</tr>
<tr>
<td></td>
<td>(b) If yes, has the simulation exercise been conducted in advance?</td>
<td>Yes/No</td>
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<th>S.No.</th>
<th>Key determinant and question</th>
<th>Scale</th>
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</thead>
<tbody>
<tr>
<td>1</td>
<td>Response guidance: Was the response guidance and instruction communicated quickly from the HQ to faculty and staff?</td>
<td>Yes/No</td>
</tr>
<tr>
<td>2</td>
<td>Information sharing: Was the information sharing in university open and smooth enough?</td>
<td>Yes/No</td>
</tr>
<tr>
<td>3</td>
<td>Decision-making: Was the decision-making process regarding change in academic activities timely?</td>
<td>Yes/No</td>
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survey respondents represent a mixed gender composition, including both teaching and research staff from public and private universities. Close to half of the respondents reported having added management and outreach responsibilities owing to the pandemic. The quality of study (risk perception) results were affirmed as majority of the survey respondents (68%) have more than ten years of experience in higher education institutions. In other words, majority of the respondents have provided higher education and/or conducted research under different types of HEI leadership as well as local, regional and national regimes.

3.2.1 University-level analysis of organizational preparedness and response to COVID-19. Ninety-three of the 150 survey respondents disclosed the names of their universities/HEIs. After filtering the multiple responses from the same university and omitting the discrepant responses (process explained in subsection 3.1), the unique data of 51 universities from 22 countries was used to assess the organizational preparedness and response determinants.

3.2.1.1 Organizational preparedness. Figure 1 shows that 47% of respondents with defined universities believe their institutions lacked a permanent or dedicated emergency management office, and 41% said their HEIs lacked a general business continuity plan for an emergency. This shows that close to half of the responding universities have not developed BCP yet. As such a key preparedness plan is crucial to maintaining safety on campus, the situation has to be fixed urgently.

<table>
<thead>
<tr>
<th>Key determinant</th>
<th>Research question</th>
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<tbody>
<tr>
<td>Response activities at the organizational level</td>
<td>What kind of response activities were taken by your university against COVID-19? (multiple choice question)</td>
</tr>
<tr>
<td>Identified challenges at the organizational level</td>
<td>What kind of challenges did you find in your university’s preparedness and response? (multiple choice question/top 3)</td>
</tr>
<tr>
<td>Preparedness lessons at the organizational level</td>
<td>Based on your experience, what kind of preparedness measures would you recommend for the University in future? (Short text answer)</td>
</tr>
<tr>
<td>Responses activities at the personal level</td>
<td>What were your personal response activities against COVID-19 pandemic? (multiple choice question/top 3)</td>
</tr>
<tr>
<td>Identified challenges at the personal level</td>
<td>If you switched over to online teaching, what were the key challenges? (multiple choice question/top 3)</td>
</tr>
<tr>
<td>Preparedness lessons at the personal level</td>
<td>If you can bring one key lesson from the pandemic for your future professional preparation, what would be that? (short text answer)</td>
</tr>
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Table 3. Questions to assess the COVID-19 response activities and challenges

![Figure 1. Organizational preparedness determinants for the 51 defined universities](image)
In universities with BCPs, 33% of the plans do not cover biological hazards and pandemic risk management, and 60% of the plans did not include conducting any advanced simulation exercises. Based on these reported figures, it can be deduced that several organizations were not prepared for a global pandemic such as COVID-19. While many universities did not have a permanent emergency management office or business continuity plan in place, there was also very limited focus on biological hazards and advanced simulation exercises.

3.2.1.2 Organizational response. In relation to the organizational response determinants, Figure 2 shows that more than 70% of the respondents said the instruction, information sharing and decision-making processes were timely and open. However, 30% of the respondents said their HEIs need to urgently improve in these areas. It is assumed that with better plans and resources such as BCPs and EMUs, more universities can potentially make faster and effective responses to global scale disasters including pandemics. In total, 67% of the universities that did not have BCPs said instructions were communicated quickly enough but the information sharing process was not open and smooth enough.

3.2.1.3 Correlation analysis. Spearman’s correlation matrix was used to analyze the strength of association (significance levels of co-relation) between the defined determinants of organizational preparedness and response. It is important to note that the values in Spearman’s correlation always range from “−1” to “1” with a value close to the extreme ends denoting stronger association. Also, as the correlation matrix is symmetrical, the values above the diagonal will have the same values as below. The positive significance values of co-relation denote a positive relationship among all the concerned determinants. That is, if the response for one of them is “Yes,” the other determinants have a high probability of being “Yes” too.

Table 4 shows that the highest significance levels of co-relation below the diagonal (0.70) indicates that the determinants of “Smooth Information Sharing” and:

Timely Decision making are strongly associated. Further, it shows that the presence of a BCP and permanent EMU in universities is positively associated with all the response determinants of ‘Quick Response Guidance’ and ‘Smooth Information Sharing’

Notably, the relationship between BCP and the organizational response determinants is stronger that with the EMU. The study found that a pre-determined BCP, and an established EMU in a university can considerably enhance the organizational response to hazards such as COVID-19. The strong relationship among the three organizational response determinants is clear from their high correlation values (0.53, 0.43 and 0.70), which
underscore the strong link between them (quick response guidance and instruction may lead to smooth information sharing).

3.2.2 Individual-based analysis of COVID-19 university response activities, challenges and key lessons.

3.2.2.1 Types of organizational responses. Figure 3 highlights the COVID-19 response activities carried out by the universities. It shows that majority of the respondents reported that the physical locations of the HEIs are affiliated with are temporarily closed down tuition is now through online classes. In addition to tweaking the academic calendar, several universities have reportedly extended support to their immediate communities and local governments. This is in the form of technical assistance such as modeling and forecasting and health-care support such as production of personal protective equipment and hand sanitizers and data sharing. In the “Others” category, the respondents provided additional response activities at the organizational level. These support activities range from converting university hostels into quarantine centers, to fundraising campaigns, volunteer services, financial and psychological support to stranded students, etc.

3.2.2.2 Key challenges at organizational level. The respondents were asked to select three key challenges that their HEIs have had to face during the COVID-19 pandemic (Figure 4). The major challenges identified were a lack of adequate preparedness for a pandemic and of pandemic-specific advanced simulation exercises. The study found that half of the responding universities did not have BCPs and EMUs, which correlates with the results from questions on organizational preparedness.

<table>
<thead>
<tr>
<th>Determinant name</th>
<th>Emergency management unit</th>
<th>Business continuity planning</th>
<th>Quick response guidance</th>
<th>Smooth information sharing</th>
<th>Timely decision-making</th>
</tr>
</thead>
<tbody>
<tr>
<td>Emergency management unit</td>
<td>1</td>
<td>–</td>
<td>–</td>
<td>–</td>
<td>–</td>
</tr>
<tr>
<td>Business continuity planning</td>
<td>0.57</td>
<td>1</td>
<td>–</td>
<td>–</td>
<td>–</td>
</tr>
<tr>
<td>Quick response guidance</td>
<td>0.27</td>
<td>0.34</td>
<td>1</td>
<td>–</td>
<td>–</td>
</tr>
<tr>
<td>Smooth information sharing</td>
<td>0.21</td>
<td>0.47</td>
<td>0.53</td>
<td>1</td>
<td>–</td>
</tr>
<tr>
<td>Timely decision-making</td>
<td>0.03</td>
<td>0.19</td>
<td>0.43</td>
<td>0.7</td>
<td>1</td>
</tr>
</tbody>
</table>

Table 4. Spearman’s correlation matrix for preparedness and response determinants

Figure 3. COVID-19 response activities at organizational level
The other two challenges identified in the survey were the change in the mode of teaching to online lectures and working from home. Most HEIs have never experienced a global scale pandemic and making the shift from face-to-face classroom teaching to online teaching was a major change that posed a significant challenge for many HEIs. In particular, the course which has laboratory experiments and studio work, it was rather difficult to make the changes instantly. On the other hand, it also provided an opportunity for universities to invest in adopting an innovative educational system which can support teaching, interaction and discussion in multiple ways and modes. It is, therefore, unsurprising that in the “Others” category, the importance of strengthening internet access to students and teachers was highlighted.

3.2.2.3 Key lessons for future organizational preparedness. Seven recommendations for future organizational preparedness were made from the responses received:

- **Planning and familiarization for multiple educational method and tools:** there is a need to develop backup plans for meeting various academic requirements such as conducting end-of-term and thesis examinations, during emergency situations. It is extremely important to provide necessary support to students for internet-based teaching, discussions, educational systems and examination methods.

- **BCP:** to prepare for emergencies, a university-level and a faculty, graduate school, academic department level-BCP is required. The BCP should establish guidelines for switching to an online education delivery system, including the process, preparation, communication with students and providing necessary support to them.

- **Emergency management unit (EMU):** A dedicated emergency management unit should be created in all HEIs. The mandates and responsibilities of the EMU should be communicated to all staff, faculty and students. EMUs should proactively conduct and lead simulation exercises at regular intervals on different scenarios that include biological hazards and ensure timely training and capacity building of task forces dedicated to such events at campus and department level.

- **Risk communication:** HEIs should conduct regular awareness programs on risks, preparedness and responses for staff, faculty and students. To realize this, a thorough risk assessment is crucial, and it should follow all hazard approaches. Currently, risk communication strategies at HEIs are framed around natural disasters and laboratory based fire/chemical safety risks. Potential biological
hazards, risks of sudden attack/mass shooting, riots, stampede, etc. should also be part of the risk communication strategy.

- **Blended learning approaches**: HEIs are urgently required to upskill in the use of online platforms/modes alongside classroom/fieldwork teaching. To regularize the blended approach, a fair share of lectures/classes every year/semester can be conducted online.

- **Networking**: to enable knowledge and information sharing during emergencies, universities should establish strong networks with local governments, other universities, the private sector, civil society organizations and communities. These partnerships will help to advance the risk reduction agenda not only at HEIs but in the larger system within which HEIs exist.

- **Designated funding**: universities should set aside reasonable designated funds to boost research and innovation against all forms of hazards. In addition, they need to plan for tough times when disasters have widespread impact on all sectors of the economy.

3.2.2.4 Personal responses to COVID-19. **Figure 5** highlights a wide range of personal response activities carried out by respondents in response to COVID-19. It shows that majority of the respondents have been giving online classes while working from home. This means the respondents have spent considerably more time getting used to providing online lectures, attending online courses and webinars while also managing routine academic administration and research activities. This leaves little time for conducting additional activities such as community services or even shopping for their routine needs. Moreover, owing to the nature of coronavirus disease and its mode of contraction, the assistance provided in the form of community service remains extremely limited.

3.2.2.5 Personal challenges in online teaching. **Figure 6** highlights the key challenges reportedly being faced by the respondents in switching to online delivery of lectures. Majority of the respondents identified conducting group works, technical difficulties (such as slow internet speed, unstable internet connection, etc.) and maintaining student motivation (because students are used to studying in a classroom environment) as the top three challenges they face. The further pointed out that group discussions and assignments are difficult to effectively conduct in online environment. This was identified as major disadvantage for both students and faculty.
3.2.2.6 Key lessons from COVID 19: Academic/research continuation on future pandemics. Key lessons for better preparedness for future disasters were identified by the respondents through short descriptive answers. They are summarized as follows:

- **Personal safety**: there is a dire need for everyone to take adequate precautions and safety measures such as wearing masks, optimal personal hygiene and maintaining physical distance to prevent infections. It is important to rely on authentic sources of information, rather than social media posts which are often half-baked or exaggerated.

- **Raising awareness on epidemics and pandemics**: every academic faculty and administrative staff at HEIs should get training on adequate and up-to-date awareness on safeguards against biological hazards. It is common to have knowledge of local natural hazards, but one must not forget that “disasters” and “risks” can also be from non-natural and human-induced hazards.

- **Wider range of teaching methodology and tools**: It is important for every HEI to promote and effectively provide resources for teaching by exploring the immense power of internet. It was recommended that universities provide suitable exposure and training to faculty, staff and students and also help them with reasonable resources to learn effectively through Web-based teaching methods. It is also crucial that the homes of faculty and students alike are equipped with stable and high-speed internet connection for smooth application of various methods.

- **Research and innovation**: COVID-19 has triggered an urgent need to invent alternatives to the conventional classroom-based teaching methods. Laboratory-based research has certainly been hit hard owing to restricted movement within and outside university campuses and social distancing rules that make it hard to conduct lab-based research in collaborative teams.

4. Key immediate and long-term mitigation measures

The survey results show that many universities do not have BCPs or, in cases where a BCP exists, have not conducted simulation exercises for a pandemic scenario. Further, at the organizational level, in most HEIs, the faculty, staff and students face significant difficulties in adjusting to the switch to online delivery of classes. This is because of technical issues such as a lack of strong internet connectivity, unfamiliarity with online classroom/conference platforms and inability to use different approaches to teaching and learning such as group work and discussions.
As a positive side, the survey also showed that universities have been working actively with local governments and other partners by sharing data and providing technical advice. Thus, universities are expected to play a crucial role and contribute to society.

Based on the survey findings, the following recommendations are expected to strengthen the current disaster preparedness capacity in HEIs.

4.1 Governance/planning (short term)
A planning document such as an emergency management plan/BCP provides the foundation for risk management. It is crucial to develop a plan based on capacity, vulnerability and needs assessment and to identify clearly what needs to be done in each stage to manage a disaster and ensure safety on campus. This includes establishing an incident command system for emergencies and conducting regular mock exercises, drills and simulations to test the plan and determine its effectiveness (APRU, 2015). While developing a campus emergency plan, it is important to make it an adaptable document that can address a variety of emerging hazards and that provides strategies and practical approaches to tackle different types of disasters.

In addition, universities urgently need to consider carrying out simulation exercises and making it a regular disaster preparedness activity. The simulation exercise must take different scenarios including pandemics into account because responses may differ from disaster to disaster.

4.2 Infrastructure/educational system (short term)
The lessons learned from the current pandemic that are addressed in the survey include the need to adopt a new and innovative educational system. This requires both technical support in the form of training and financial support with investment in high-speed and stable internet connectivity not only on campus but also at home. Furthermore, it is crucial to include clearly stated guidelines in a BCP on the procedure to be followed for making changes while conducting crucial ceremonies and activities such as graduations, commencement ceremonies and examinations.

4.3 Physical/mental health
A sizeable portion of students live in the university dormitories and rented accommodations. Owing to strict lockdown in many countries, the students experienced high level of stress. Many students also experienced financial stress and were unable to pay rent, utility bills or internet as many students’ support from family also dried because, at times, family members also lost jobs. Owing to lack of planned approach and inexperience to work from home, many felt that their functionality is impacted. On the contrary, a sizeable number of people also reported that they were more productive while working from home and some felt that their workload is increased after the pandemic related restrictions are implemented.

4.4 Reopening of campuses
There is a big uncertainty around re-opening of university campuses. In many university campuses, classroom or face-to-face teaching is completely stopped until July 2020 or later. In addition, a number of universities have shifted the dates of their entrance/final exam and of semester start/finish without further notice of new dates of
conducted these activities. Senior high-school students and final year university students are facing unique situation owing to ongoing restrictions around organizing welcome/orientation/graduation ceremonies. Current students are also going through anxiety owing to uncertainty around campus reopening dates and many are considering to return to their families to save on rents and other expenses.

5. Conclusion
Most universities do not have experience dealing with a pandemic such as COVID-19, unlike responding to natural disasters. Therefore, this is their first significant experience with changing the styles, systems and methodologies of education, research and contributing to society. This sends a clear message regarding the necessity to prepare for both frequent disasters and unfamiliar ones such as chemical, technological and biological disasters that take a heavy toll. The most important elements for creating a disaster-resilient university are developing an all-hazard plan, conducting regular trainings and exercises, developing strong community partnerships (Kapucu and Khosa, 2013) and taking innovative approaches to education and research.

Universities in English-speaking countries are facing a rather unique challenge of loss of income. However, they possess a rich experience of providing online classes. Therefore, this is the time to promote north–south collaboration among universities continue to generate, distribute and share knowledge even when a pandemic such as COVID-19 disrupts the world order.

This study has helped to better understand challenges faced by and opportunities available to HEIs. HEIs will have to consider post-COVID-19 scenarios seriously and how they can remain relevant to their students and the society at large. Internet-based teaching is relatively new for most universities in Asia, and to some extent, is forced. However, this also opens a dialogue to prove the effectiveness of HEIs in creating a knowledge society. Beyond digital technologies, HEIs need to reposition themselves to augment the skills needed to prepare a workforce that is better prepared to respond to future disasters of a similar scale.

References
Managing and responding to pandemics


Further reading

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