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## Creating 'COVID-safe' face-to-face teaching: Critical reflections on on-campus teaching during a pandemic

### Abstract

The COVID-19 pandemic of 2019 meant higher education was forced to delivering education online. For most, the transition to emergency remote teaching was a natural next step to support continuity of education. However, there were some examples where education remained on campus. Where after taking all COVID-19 safety measures of social distancing, hand hygiene measures and other health protocols, institutions decided to continue to deliver face-to-face on-campus offerings with limited capacity. The COVID-19 and higher education literature have focused primarily on rapid digitalisation. This manuscript adds value to the literature by focusing on three case studies of on-campus delivery for face-to-face teaching in the classroom and practical lessons during the pandemic in Australia, the United Kingdom, and Pakistan. The changes to the learning process affected students' interactions with the lecturer, other students, and the equipment they were learning to use. Also, it affected interactions with each other in practical activities due to limited numbers of participants, motivation in learning and achieving learning outcomes. Not only the students, but the lecturer's capability in delivering the course was affected by fatigue due to spending more time teaching within a 'COVID-19 safe' environment. This study will provide important documentation on the effect of COVID-19 on on-campus delivery, as well as opportunities to support greater student engagement in class environments through the sharing of learning equipment, fostering positive motivation, managing learning outcomes, and self-monitoring of lecturer capability in more highly stressful teaching and learning environments practical training affected.

### Keywords

COVID-19, practical education, maritime education, social distancing, Students' engagement, face-to-face teaching

## Introduction

During the early 2020s, higher education has experienced radical change. The novel coronavirus (COVID-19) pandemic has meant most higher education institutions (HEIs) progressed rapidly to digital, blended and hybrid models of teaching (Crawford et al., 2020), although for some, this was not new but rather accelerated (Colasante et al., 2020). A reason for digitalisation was the insufficient space for all students in the classroom to allow for adequate physical distancing (Fung & Lam, 2020) and to prevent unnecessary exposure to the virus for students and staff. Significant work has been undertaken to provide continuity of teaching during the pandemic, with considerable difficulty in how to deliver practical educational activities experienced. While most lessons were online, some HEIs allowed limited student numbers on campus.

There are significant pedagogical differences between face-to-face and digital teaching arrangements (Muir et al., 2020). Face-to-face teaching can foster greater peer-to-peer and peer-to-teacher personal interaction. The lecturer plays an essential role in supporting student-directed learning through engaging their interests and motivations, often through close proximal interactions within a practical class setting (Sokele et al., 2019).

The current literature on COVID-19 in higher education discusses that – with low frequency – learning activities continue to occur on campus. Still, most institutions are struggling with changes to new context (Butler-Henderson et al., 2021). During COVID-19, face-to-face teaching has affected the learning process in practicals or hands-on classes due to the reduced number of students and the requirement to follow COVID-19 protocols. The awkwardness of smaller numbers in large learning spaces, and the necessity of physical distancing measures, has likely impacted learning efficacy. A limited number of students means that students have fewer opportunities to have meaningful peer-to-peer interactions. In practical settings, they can have a smaller number of observations through collaborative learning.

The existing evidence on COVID-19 in higher education focuses on how educators have translated their face-to-face delivery to online offerings in a short period, typically termed ‘emergency remote teaching’ (Tabatadze & Chachkhiani, 2021). This research focuses on how some educators, namely three institutions (located in Australia, the United Kingdom and Pakistan), have engaged in maintaining on-campus teaching arrangements for practical classes and the effect on teaching and learning efficacy. To fill this research gap, this study investigates the challenges of face-to-face teaching with COVID-19 safety protocols and the effects on both the lecturer and students.

This manuscript aims to address three research questions:

- a) What effect did face-to-face teaching have on student learning during COVID-19?
- b) What effect did face-to-face teaching have on lecturers?
- c) How did on-campus learning change students’ practical engagement with professional learning tools?

This paper begins by exploring the challenges in the maritime sector, within which this study is situated. It discusses the impact on students’ practical learning, the effects on social interaction in students due to wearing a face mask and the consequences of wearing a face mask during teaching delivery when social distancing is required. Following a summary of the literature, this paper presents a critical reflection of three similar yet distinct experiences of maintaining on-campus

learning during the COVID-19 pandemic. To date, there are few, if any, manuscripts that present a focus on the continuation of on-campus learning.

## **Literature review**

With face-to-face teaching during the COVID-19 pandemic, teaching had to change to hybrid, blended and online teaching. The institutions that continued face-to-face teaching, with enhanced measures of safety, have met different challenges. In response to research question one (RQ1), the literature review discusses seafarers' backgrounds and qualifications to work on a ship. It provides information about the effect of face-to-face teaching in maritime education during a pandemic. The review also discusses students' learning, motivation and wellness due to safety protocols such as sitting a distance away in the classroom. In response to RQ2, it discusses fatigue due to wearing facemasks during professional activities. Finally, in response to RQ3, the discussion of scholarship discusses the effect on learning senses in students' practical activities due to COVID-19.

### ***Maritime education***

Shipping is a global industry. This section has international scope and is considered a core logistic area to transport goods around the world. Because there are few cross-border restrictions, ownership in the shipping industry has increased and companies are also recruiting seafarers internationally for jobs (Gekara, 2009). Seafarers typically attain a qualification prior to starting work in the shipping profession.

There is an international framework for seafarers to achieve qualifications in the shipping industry: *The Standards of Training, Certification and Watchkeeping for Seafarers* (STCW). This framework is published, maintained, monitored and upheld according to the United Nations International Maritime Organisation (IMO), and is considered the global benchmark (Teo, 2018). Under STCW, there are IMO model courses for seafarers. There is a table of course outlines in every IMO model course that highlights competencies and areas of knowledge, understanding and proficiency. This list shows the estimated hours required for lectures and practical exercises. For example, the duration of the advanced training in the firefighting course is 29 hours, comprising lectures, demonstrations and practicals (International Maritime Organisation, Model course-2.03, 2000). Seafarers have previously articulated a distinct preference for face-to-face learning.

According to Ochavillo (2020), during the COVID-19 pandemic, teaching was shifted to online in the maritime institutes of the Philippines. Survey results ( $n = 271$ ) show that 56.09 percent of the maritime students prefer face-to-face, and 21.03 percent and 22.88 percent prefer online learning and blended learning, respectively. The practice of online maritime teaching was partially consistent with the sector. Some institutions, however, retained on-campus learning where possible.

### ***Social learning, well-being, and motivation***

Classroom layout is essential in students' interaction and learning. During the pandemic, those who continued face-to-face delivery developed and followed protocols to ensure traditional face-to-face teaching in class was safe. These protocols did not always lead to effective outcomes. Universities that delayed commencement and adhered to minimum standards of physical distancing tended to perform worse on national student experience surveys. Students were seated physically spaced away from each other, creating a naturally awkward experience for those transitioning from a previous experience to a new one. The environment was less conducive to student interaction which can

negatively impact student sense-making and learning. Students who effectively engaged with each other felt more connected despite the elements of disconnection both in their classroom and the pandemic society (Wilson et al., 2020). Less student interaction due to physically distanced space affects motivation and engagement in learning. Lack of authentic and interpersonal relationships causes demotivation and disengagement. If there is an authentic relationship between students and lecturers in the classroom, it results in psychological well-being, engagement and belonging. Also, the immediate contextual surroundings on-campus impact students' motivation, wellness, self-image and success (Watermeyer et al., 2020). Kahu and Nelson 2018 discuss how students' wellness and success may be enabled by providing support in budgeting, psychological support and life skills modules.

### ***Fatigue using face masks***

Some COVID-19 health and safety protocols affected the efficacy of teaching and learning. The use of a face mask, while an essential component in face-to-face teaching, can create a barrier to social and verbal interaction between students and teachers. Spitzer (2020) discusses the benefits and burdens of speaking through a face mask, which may absorb higher frequencies and suppress visual lip signals. Finally, it drops motivation in the conversation. Continuously speaking through a face mask can cause vocal fatigue due to the effort required in speaking. It can result in mental fatigue and more tiredness. Ribeiro et al. (2020) discuss comparing the effect of wearing a face mask between a working group and an essential activities group. The face mask produced the symptoms of tiredness, vocal impairment, vocal fatigue and voice disorders. People who use a face mask for professional activities impact their vocal tract due to trying to speak intelligibly while maintaining coordination between breathing and speaking. This results in vocal fatigue, which is related to mental fatigue. Mental fatigue causes tiredness and a feeling of effort.

### ***Students' practical engagement during COVID-19***

Students learn by observing others, touching and engaging with equipment in practical activities, manipulating information and questioning. During COVID-19, practical activities changed to the online classroom. To translate for remote and distance teaching modalities, lecturers typically presented practical activities in virtual classrooms, with the effort to build an immersive environment where possible. Students were able to see presentations, videos and photos, with opportunities for synchronous assessments (Hlescu et al., 2020). However, in practical activities, students learn through peer-to-peer sense-making and observation of practical action. Before the COVID-19 pandemic, students who engaged in practical activities were able to learn kinaesthetically. Students were learning through touch, but also through their observations and engagement with others. Due to COVID-19, students have reduced opportunities to engage kinaesthetically with their learning activities and resources. Despite that, effective learning happens by activating different modes of senses such as hearing, touch, sight, speak, smell and taste (Biggs & Tang, 2011).

Lujan and Di Carlo (2006) identified that first-year medical students preferred a single mode of learning. According to student responses, 36.1 percent prefer a single mode of learning: 5.4 percent of these prefer visual learning (such as graphs, images, and flow diagrams), 4.8 percent prefer auditory speech, 7.8 percent prefer learning by reading and writing and 18.1 percent prefer kinaesthetic learning by using all senses such as touch, hearing, smell and taste. The other 63.8 percent prefer learning from different modes. This means that, due to COVID-19, kinaesthetic

learning has been affected in face-to-face practical teaching. Kinaesthetic learning happens by touch, reading instructions and manipulating equipment. However, Vlachopoulos and Jan (2020) also found that students preferred flexibility in choosing between online and on-campus lecture opportunities.

## **Context**

### ***Australian Maritime College (AMC), Australia***

The University of Tasmania (UTAS) is a public research university primarily located in Tasmania, Australia. It has campuses within the three main regions of Tasmania: Hobart, Launceston and Burnie. In addition, there are two other campuses in Sydney, Australia. UTAS is consistently ranked within the top two percent of universities in the world.

The Australian Maritime College (AMC) is a specialist maritime institute of the UTAS and is the National Institute for Maritime Education, Training and Research. At AMC, there are different departments, including maritime engineering and hydrodynamics, maritime business and logistics, ocean seafaring and vocational education and training. Before COVID-19, AMC had an annual intake of approximately 1,200 students. AMC was ranked number one in March 2020 of all member universities, as well as for global engagement and research, in the latest International Association of Maritime Universities (IAMU) benchmarks.

The first COVID-19 case in Australia was detected on 19 January 2020 (Department of Health, 2020). On 15 March 2020, UTAS paused face-to-face teaching. Due to COVID-19, major changes were implemented by UTAS in all its campuses. On 15 June, AMC started practical lessons and short courses. Before beginning face-to-face lectures, safety measures were put in place, such as filling out COVID-19 safety plan checklists, screening before entering UTAS buildings, maintaining a one and a half metre safe distance and using UTAS identity cards for entering buildings. Posters noting the maximum number of persons allowed in the offices and classrooms were displayed, and hand sanitising stations were installed at numerous locations. All professional, academic and technical staff and students were required to complete an online COVID-safe return module before starting physical work and face-to-face teaching at AMC.

### ***City of Glasgow College, United Kingdom***

The City of Glasgow College is a higher education college located in Glasgow, United Kingdom. It has two campuses: Riverside and City. There are many faculties such as hospitality and leisure, education and humanities, hair and beauty, nautical, STEM (Science, Technology, Engineering and Mathematics) and computing. In STEM, there is a marine engineering course. In the maritime sector (nautical and marine engineering), nearly 1000 students take admission per year. Enrolment has been affected due to COVID-19. It is ranked in the top 10 in the United Kingdom.

The first person who entered the UK with the symptoms of COVID-19 did so on 23 January 2020 (Lillie et al., 2020). As the cases began to increase, major changes were implemented by the City of Glasgow College in standard operating procedures (SOPs). These changes included reducing classroom sizes, using one-way entrances into classrooms and other enclosed places, wearing a face mask in the classroom, screening a number of times during working hours, keeping belongings in one bag when coming to the classroom and maintaining two meters social distance.

### ***Khawaja Fareed University of Engineering and Technology (KFUEIT), Pakistan***

Khawaja Fareed University of Engineering and Technology is a young Pakistani public sector university, with its foundation laid on 24 April 2014. It is located in the southern part of Punjab, Pakistan. Previously, it was a sub-campus of the University of Engineering and Technology (UET), Lahore. However, as a new university, it is currently unranked. More than 52 undergraduate (mechanical engineering, civil engineering and agricultural) and postgraduate programs (computer science, management, civil and mechanical engineering) are offered across more than 10,000 students, including approximately 4,000 students in the engineering programs.

The first case of COVID-19 in Pakistan was detected on 26 February 2020 (Abid et al., 2020). With the spread of this pandemic, the university commenced online and distance modes of education. From September 2020, the Government allowed educational institutes to re-start face-to-face education in alignment with WHO guidelines. These guidelines included maintaining a social distance of at least one and a half metres, using facemasks at all times in the lecture theatre, reducing the maximum number of students allowed in the classroom and laboratory, using personal sanitizers, and continuously disinfecting engineering labs between use.

### **Method**

COVID-19 restrictions meant that the research team could not collect data conventionally. Sy et al. (2020) discuss the impact of COVID-19 on traditional data collection and notes that the pandemic made it challenging to collect data through face-to-face physical interviews and focus groups, collaborative working to find data and dissemination of findings at conferences. The traditional method of collecting data needed to be modified to support COVID-19 restrictions.

This method adopts a collective autoethnography method (Wilson et al., 2020). This method has similarities to the extreme comparison used in Shelley et al. (2019). Throughout this method, the research team engaged in critical reflection of a series of questions independently, involving careful reflection of observations made during unique teaching experiences. Sy et al. (2020) describe the value of data collection methods through observation. Due to COVID-19, this, therefore, was the most suitable approach for data collection. Following independent reflection, the group returned for critical discussion and synthesis. There were three participants from different locations who had unique experiences in teaching face-to-face during the pandemic. It was also convenient for sampling because of maintaining on-campus teaching. On 22 October 2020, self-developed guiding questions, including seven open-ended questions, were reflected on by the research team. The questionnaires focused on evaluating the delivery of face-to-face units during COVID-19 of these three education programs. The participants were asked to answer the questionnaire and return it to the researcher. The three authors made up the sample and constructed it as collective autoethnography. For this reason, no ethics approval was sought. Each of the authors has completed an independent evaluation and reflection of their program within a series of broad areas. The participants were asked to reflect on their face-to-face teaching based on nine points as follows:

**Table 1***Topics with definition for questionnaires*

<b>Topic</b>	<b>Definition</b>
COVID-19 protocols implemented within the course	The effect after implementing COVID-19 protocols in all three institutes in face-to-face teaching on campus.
Use of shared learning equipment and papers	The effect on interactions with learning tools due to social distancing and hygiene practices by students.
Groupwork	The effect on students' group works due to wearing a facemask and social distancing.
Peer-to-peer interactions	The effect on peer-peer interactions and engagement due to physically distanced desks, increased social distancing and hygiene practices within face-to-face classes.
Changes to assessments	The effect on face-to-face classroom assessments due to COVID-19 protocols.
Motivation	The effect on students' motivation in attending lectures on campus with COVID-19 protocols.
Changes in achieving the intended learning outcomes	The effects on learning outcomes due to decreased peer-to-peer interactions; no sharing of learning equipment and fewer students in the classroom.
Fatigue and strategies to overcome	The effect on lecturer fatigue during teaching, and difficulties due to the smaller number of students in practicals, wearing a facemask, goggles and keeping social distancing. Strategy by the lecturer to cope with the fatigue for improving capability.
Well-being	The effect on well-being in students and lecturers due to COVID-19 and strategies by all three institutes for the overall well-being of students and lecturers.

After collecting data via questionnaires, the data were analysed to identify challenges in face-to-face teaching with COVID-19 by looking at themes, similarities and differences between the three institutes.

## Findings

During COVID-19, students and lecturers had to follow strict safety protocols before re-starting face-to-face classes on campus. It was strictly prohibited for students to share learning equipment, learning guides and papers in the classroom and during practicals. Due to physically social distancing and wearing facemasks, peer interaction and discussion were reduced. Also, in the classroom, the lecturer tried to do less group activities. Due to these safety challenges and protocols, students had reduced motivation in learning. As a result, students' learning outcomes were affected. To achieve positive learning outcomes, lecturers had to work hard by giving extra time to students

in practicals and teaching. Due to working hard within the safety protocols, lecturers started to face fatigue and burnout, which affected lecturers' capability in teaching.

### ***COVID-19 protocols and courses***

After implementing COVID-19 policies, the number of students in face-to-face teaching was reduced. Before each face-to-face teaching session, students and lecturers had to follow standard operating procedures (SOPs) such as health screening before starting classes, wearing face masks, and maintaining a physical distance during interactions with each other.

At all three institutes, lecturers achieved their goals with COVID-19 protocols in place for face-to-face teaching. The institutes implemented their SOPs such as screening procedures and Risk Assessments (RAs) before starting face-to-face classes during COVID-19. During this time, AMC and Glasgow College started short courses with face-to-face teaching. All main maritime academic courses were planned to start online. After taking safety measures, these institutes updated the maximum numbers of students allowed in classrooms. In AMC, it was a maximum of 12 students, Glasgow College eight and Khawaja Fareed University of Engineering and Information Technology (KFUEIT) 25 students. At both KFUEIT and AMC, lecturers did not need to wear face masks or shields when teaching in the classroom. However, they maintained one and a half metres of distance. In Glasgow College and KFUEIT, students wore face masks during face-to-face lectures. In AMC, students were not required to wear masks but had them on their tables as a standby, along with goggles and gloves.

In AMC, before joining face-to-face classes after COVID-19, students were required to complete an online COVID-19 awareness module to gain knowledge relating to symptoms and precautions to be taken. In addition, students had to undergo health screening before entering any buildings. In KFUEIT, students and lecturers were screened randomly every week. In Glasgow College, students and the lecturer had to screen multiple times during the day. In addition, there was a requirement of two metres of physical space from each other in the classroom and practicals. Before starting the class, students were each given a plastic bag to put their textbooks and jumpers in. After finishing the class, students threw away that bag.

Before COVID-19, there were no requirements for social distancing, screening, using hand sanitisers, face masks and gloves in classrooms, although there was a requirement for doing risk assessments for practicals. There was no engagement and interactions between students or the lecturer, so student learning was not affected much. The maximum number of students in the classroom for AMC was 16 or more, Glasgow College 16 and KFUEIT 50.

### ***Sharing learning equipment and papers***

Due to the COVID-19 epidemic, students had to follow the strict protocols of their institutes in the sharing of any papers, learning guides and equipment. This affected students' learning because students were not touching the learning equipment related to their topic. Furthermore, it meant that students were not using feeling and touching senses and could not read the equipment, which affected students' learning.

In KFUEIT, with the COVID-19 conditions, the sharing of equipment in the laboratory during experiments was strictly prohibited. In AMC, students were not touching much of their learning tools belonging to the survival course because every time students used the equipment, they had to

use wipes for cleaning. This meant that students were not activating senses such as touching and feeling. This may continue to affect students' learning for a long time. In Glasgow College, when students used their GMDSS (Global Maritime Distress and Safety System) radio equipment for practical purposes, they had to clean the equipment after use and follow all hygiene practices. In addition, there was no interchange of any learning tool, learning guide or papers between the students.

In KFUEIT, the lecturer recorded all lab work during the performance of any experiment so that if someone missed some points, they could see the recording as required. By this means, there were fewer requirements for touching laboratory equipment between the students and learning by watching the recording repeatedly as needed.

Before COVID-19, in Glasgow College, there was an interchanging of marked papers between the students. In short courses, like survival at sea in AMC, there were learning tools in the classroom such as lifebuoys, emergency position indicating radio beacon (EPIRB), lifeboat food rations and hydrostatic release units (HRU). Students used to handle equipment freely in the classroom and could touch, feel and manipulate the equipment, thereby using different senses to learn about the equipment. Also, the lecturers used to rotate learning tools between the students during the lecture in the class for better understanding. For example, during teaching about the lifeboat food ration and HRU, the lecturer would rotate these between the students for better understanding. In KFUEIT, there were 25 students in the lab for demonstrations. Students could touch lab equipment freely and manipulate information.

### ***Groupwork and collaboration***

Group activities were reduced due to COVID-19. There was less discussion and interaction between peers in the classroom because of wearing face masks, maintaining social distance and other COVID-19 protocols.

Students were using masks and gloves during group work in the classroom and practicals in all three institutes. These institutes allowed a limited number of students in the practicals. KFUEIT reduced class group activity. If group work was necessary for the classroom, online groups were created through Zoom and participation was encouraged. In the group activity with laboratory experiments, students sometimes got exhausted taking part in them because of wearing masks, and the lecturer had to suggest taking more frequent breaks. In Glasgow College, students were learning one-on-one with their equipment in the GMDSS course, so group activities were not utilised. However, there was group work in the ship simulator exercise. Students were following all protocols by wearing a face mask and gloves in the bridge simulator exercise. During this simulator exercise, the maximum number of students was reduced to two. In AMC, students continued class group work by following COVID-19 protocols. There was no restriction for reducing the number of students in group work during the class session. But during group work in the lifeboat practical, the maximum number of students was reduced because of them sitting closely in an enclosed space.

Before COVID-19, there were group learning activities in the classroom in all three institutes without any protocols. There were interactions and engagements between the students and lecturer. Students could discuss subjects freely without any risk in the class group activity. A higher number of students were allowed to take part in the practical work. In AMC, seven or eight students in the practical lifeboat activity were reduced to two due to COVID-19 protocols. In Glasgow College, the

maximum number of students dropped from five to two in the ship simulator exercise. Also, previously in the GMDSS course, there was one set of GMDSS with few students to work in the group. But now, every student had a separate set of GMDSS equipment. In KFUEIT, there used to be 25 students in the lab for demonstrations before COVID-19. Now lab performance is done by five students and later repeated by another group of five students.

### ***Peer to peer interactions***

The pandemic affected peer to peer interactions due to the requirement to maintain social distance in classrooms, so there was less interaction and engagement between the students. In Glasgow College and KFUEIT, students wore face masks in classrooms and maintained social distances. Due to these safety measures, students could not speak comfortably with each other. However, results were not affected by social distancing in these three institutes due to the lecturers working hard to achieve similar results. In AMC, students were sitting about one and a half metres away from each other. Students were not wearing face masks and could speak comfortably with each other. Before COVID-19, students used to share notes in all three institutes and discuss topics without any hesitation. In this way, lecturers did not need to speak as much whilst teaching with details.

### ***Learning outcomes***

Due to fewer peer interactions and COVID-19 protocols, the lecturers were working hard. Sometimes lecturers had to give extra time to achieve learning outcomes. In all three institutes, lecturers had to work harder with the few students because there was less interaction than if they had been in a larger group. The lecturers wanted to get similar results as before COVID-19.

In AMC, to get a better outcome in the lifeboat practicals with the smaller number of students due to the pandemic, the lecturer had to work harder by speaking more while wearing a face mask. The lecturer spent more time with two students to get a similar outcome than the six or seven students in the lifeboat before the pandemic. Also, for a better outcome with two students in lifeboat practical, the lecturer paired highly able and low ability students. In this way, the lower able student could learn from the highly able student. In KFUEIT, program learning outcomes affected during COVID-19 were engineer and society, project management, individual and teamwork. It was now the burden of the lecturer to use modern online tools to achieve their learning outcomes. This is despite the opportunities for learning in an online environment (Whitburn et al., 2021). In Glasgow College, sometimes the lecturer gave homework to achieve learning outcomes. In the practical ship simulator exercise, the lecturer acted any role required to achieve learning outcomes due to the limited number of students. There were two students allowed in the ship simulator exercise. One student acted as a Master, and another student acted as a chief officer. The lecturer worked as a helmsman to drive a ship in the simulator. Jamil and Bhuiyan (2021) discuss the advantage of a ship simulator for students' training, noting that it provides interactive professional learning by reducing gaps between theory and practical. Students play a role in a collaborative way which is similar to working on an actual ship. Every student receives a simulation scenario in a collaborative team that consists of learning objectives and assessment criteria.

Before COVID-19 in AMC, students used to interact freely with each other in the lifeboat practical. Students would learn by talking with each other and observing roles, so it was not difficult to achieve learning outcomes. In Glasgow College, there were five students in the ship simulator exercise, which was helpful to achieve learning outcomes as compared to during the pandemic. In KFUEIT,

there was no pressure on lecturers to use other resources (modern online tools) to achieve learning outcomes because students were attending all lectures face-to-face in the classroom.

### **Motivation**

The lecturers who participated in this study found that students had reduced motivation due to the challenging COVID-19 safety protocols. Therefore, it was important for lecturers to maintain motivation in the students for better results. It was tough for the students to accept the changes in their lifestyle in all three institutes due to following COVID-19 protocols. In AMC, students lost motivation in the class group work and lifeboat practical because of the need to wear masks, gloves and goggles. In KFUEIT, it was hard for the students to accept the change in their lifestyle, and students lost motivation to attend classrooms. Finally, in Glasgow College, students were not interested in joining courses due to the lack of professional jobs during the pandemic.

KFUEIT initiated a policy to arrange for motivational lecturers, and students had their sessions with their batch advisors. During lectures, the lecturer and students were not wearing face masks except for in-class group work and lifeboat practicals in AMC. Therefore, students' motivation was not affected during lectures in the classroom. But in lifeboat practicals, students lost motivations due to following COVID-19 safety protocols like wearing facemasks, goggles and glasses. In addition, the lecturer split the group with only two students rather than teaching six students in the lifeboat practical. During this activity, the rest of the students were taking a break. In Glasgow College, the number of hours of face-to-face classes was dropped in the short courses. The lessened number of hours helped maintain motivation in the short courses.

Before the pandemic, students had the motivation to attend face-to-face teaching in all three institutes. This motivation arose from the professional job opportunities available. Students could talk without any risk of health hazards from each other. There were no restrictions for wearing facemasks, social distances and following other safety protocols. Students had the motivation in learning about professional tools and taking part in practicals.

### **Assessment**

In all units, changes in assessments occurred in semester-based courses. In addition, students' assessments such as quizzes, assignments, midterm exams and final exams went online, but there were no changes in assessments for short duration courses.

In AMC and Glasgow College, assessments and teachings in all semester-based courses went online but not for the short courses. In the short courses, the paper-based assessment was continued. In KFUEIT, paper-based exams such as quizzes, assignments, mid-term and final exams went online. These were taken online through the university portal i.e LMS (learning management system). This portal is a particular tool that allows the university to assess any student as per university policies. Every student must log in through his unique ID at a particular time and go through the assessment. The portal also has features to record the clips of each student going through the assessment. Also, that tool affords a process of going through the specific assessment in a specific time slot. However, after implementing the relaxing COVID-19 policy, online assessment went back to paper-based assessment.

Before the pandemic, in KFUEIT, there were normal paper-based exams and quizzes. In AMC and Glasgow College, assessments for the short courses and semester-based courses were paper-based.

### ***Fatigue and burnout***

Lecturers faced fatigue when teaching with face masks or face shields, and this affected the lecturer's capability. Also, with the small number of students in groups, repeating the same lectures continuously and spending more time in these lectures caused fatigue to the lecturers.

In Glasgow College, it was fatiguing for the lecturer to teach whilst wearing a face shield for long hours. Another reason for fatigue was the increasing number of short courses required in a month. Before, there were two short courses for a subject in a month. After the requirement of the smaller number of students in the classroom during COVID-19, four courses were held in a month for a similar short course. This caused fatigue to the lecturer and affected their capability. In AMC, during the lifeboat practical, the lecturer suffered from fatigue due to speaking more whilst wearing a face mask and spending more time with the limited number of students. As a result, it affected the lecturer's capability. In KFUEIT, the lecturer had to deliver the same lecture a couple of times, face-to-face and online. Similarly, in the lab work, it took more than double the time for the lab demonstration. This made the lecturer's routine very hectic.

To overcome fatigue, the lecturers in KFUEIT took breaks during their lectures and practicals in the laboratory. At AMC, the lecturer took breaks in the lifeboat practical by removing his face mask and breathing fresh air. Taking such breaks by lecturers positively impacted the lecturer's capability. In Glasgow College, there were seven hours of class in a day for a short course. To assist the lecturer's capability during COVID-19, hours were split into half and half, as it was hard to do teaching for seven hours wearing a face mask. The lectures were divided so that a lecturer took half classes face-to-face and half online from home, or another lecturer took half face-to-face teaching. This helped to reduce the lecturer's fatigue.

Before COVID-19, there was no fatigue issue in delivering lectures because the lecturers were not following any safety protocols. In Glasgow College, there was no problem with seven hours of teaching per day by one lecturer. In KFUEIT, lecturers used to deliver to a more significant number of students at one time rather than taking the same lecture with a small number of students. In AMC, the lecturer used to take lifeboat practicals with more students in the lifeboat without wearing any face masks, goggles or gloves. Also, the lecturer was not required to split students into small groups during lifeboat driving and have to deliver the same teachings again and again.

### ***Wellbeing***

Covid-19 affected the well-being of students and faculty members. All three institutes arranged online and face-to-face safety induction programs, well-being modules and seminars. At AMC, an introductory online course called "A COVID-safe campus" was mandatory for all students and lecturers before attending the campus. This course included health screening stations, social distance, cleaning facilities and equipment, and the responsibility of each person related to sanitising hands and social distancing. Another module called "The path back from social isolation" was a well-being module for students returning from isolation. This course related to the psychological impact. For students' well-being, grants were given to pay electricity bills, rent, buy groceries. Also, the university paid grants to IT students to purchase laptops.

In Glasgow College, students and staff had to fill in a risk assessment two weeks before joining campus. It added to the safety and well-being of students and faculty members. After joining campus, students and staff were required to do a one-hour induction face-to-face program about risk

assessment. In this induction program, there was information about temperature checks, masks and hand sanitiser, reducing the number of students in the class, using the lift by one person at a time and social distancing. Also, Glasgow College provided a laptop to each student during their study period for students' well-being and safety. In this pandemic, some students failed exams and assignments. Glasgow College provided an extra opportunity to do the exam and work again as part of wellness for such students. At KFUEIT, there were counselling programs and seminars for students and faculty members attending face-to-face classes. In workshops, information was provided about social distancing, using hand sanitisers and avoiding sharing equipment. Also, students were informed about spreading COVID-19 to families and other people if they did not follow safety protocols. For the wellness of students, there was an arrangement of batch advisors for their counselling.

Before COVID-19, in all three institutes, there was no common issue to the safety and wellness of every student. Students were not required to do any risk assessments, attend safety seminars, or complete safety and wellness modules. If there were any wellness issues to any student, then counselling services were available in all three institutes.

## **Discussion and practical implications**

COVID-19 brought different challenges for institutions that continued face-to-face teaching with relevant safety protocols. The issues in face-to-face teaching include the impact on motivation in students' learning, enforcement of COVID-19 protocols, the effect on peer interactions between students in class, and effects on group activities and students' learning outcomes. Despite evidence that supports preference and performance inclines for online delivery (Hadiyanto et al., 2021), there were some positives to delivering on-campus during the pandemic.

During COVID-19, some maritime courses shifted online at both AMC and Glasgow College. According to Ochavillo (2020), in the Philippines, all maritime higher education institutions moved online during this pandemic. It was hard for maritime students to cope with the change from face-to-face to online study because most students did not have access to computers or the internet. During the pandemic, AMC and Glasgow College started short courses after instituting COVID-19 safety protocols. In these short courses, the theory and practical components were aligned together. Sharing of papers, touching and rotating learning tools between students in the classroom was no longer allowed. In KFUEIT, sharing of equipment whilst conducting experiments in the engineering laboratory was not allowed. In Glasgow College, the sharing of any learning tools, notes or learning guides was not allowed. At AMC, during the survival course, lecturers were not rotating learning tools between students during classroom lectures. Also, students were not touching much learning equipment such as EPIRBs and HRUs. This meant students did not experience touching, feeling and manipulating relevant equipment, which affected their learning. It is crucial to activating the different senses of hearing, touch, sight, smell, and taste (Biggs & Tang, 2011). During the pandemic, social learning in the classroom was affected due to the wearing of face masks and maintaining social distance. At AMC, students were not required to wear face masks but were required to maintain social distance as per safety protocols. In Glasgow College and KFUEIT, students were required to wear face masks in the classroom and maintain social distance. This meant students could not talk freely with each other, which could affect students' learning. These protocols affected students' interactions with each other. According to Hurst (2013), when students interact and talk more with their classmates, their learning is enhanced. In KFUEIT, rather than group discussion in

the classroom, students were asked to take part in online group discussions. By using technology, students can interact and discuss study issues with each other. An online learning environment builds trust in the learners and creates a feeling of connection in groups (Akcaoglu & Lee, 2016).

COVID-19 safety protocols changed students' lifestyles and affected their motivation for learning. At AMC, students lost motivation due to wearing facemasks, gloves, and goggles in some group activities, including lifeboat practicals. According to Spitzer (2020), a person's motivation drops when talking through a face mask. Students were split into small groups for lifeboat activities while others were taking a break to maintain motivation. In Glasgow College, students lost interest due to the need for more hours of face-to-face classes with COVID protocols in short courses. The number of hours of face-to-face classes in these courses were dropped to maintain motivation. In KFUEIT, it was hard for students to accept changes in their lifestyles due to COVID-19 protocols. In the beginning, students lost motivation in attending the classroom. According to Watermeyer et al., 2020, contextual surroundings by students while studying the on-campus impact on their motivation and success. Counselling services should be provided to individuals to face changes in individual life and behaviour due to COVID-19. To combat this, KFUEIT arranged counselling and motivational lectures for students. According to Supriyanto et al. (2020), guidance and counselling can be helpful during this pandemic. In particular, forms of support can be beneficial for those students who are individuals suffering from problems due to changes in the environment and daily life.

During a pandemic, it is extremely important that all staff and students follow safety protocols in institutes. Lecturers should set the example in following these protocols for students' motivation. Hand sanitisers, gloves, masks, and goggles should be easily accessible for students to enhance their motivation to use these resources. During COVID-19, assessments went online at all three institutes. In KFUEIT, all assessments went online. According to Hlescu (2020), students can be tested in a real-time setting in a virtual environment. However, AMC and Glasgow College maintained paper-based assessments for their short duration courses except for semester-based study. If students attend face-to-face classes in the institutions during a pandemic, classroom-based assessments should be conducted by following all safety protocols. Puad and Ashton (2020) discuss the advantage of classroom-based assessment, noting that teachers can observe the attitude and behaviour of students during the classroom-based assessment. Secondly, there is a more teacher-centred approach in viewing the classroom-based assessment. Due to being the holder of knowledge, the teacher assesses the understanding of a student. Thirdly, the classroom-based assessment makes students accountable and responsible for their effort and work.

During the pandemic, students' learning outcomes had been affected due to the following of safety protocols and the requirement for limited numbers in practical activities. At AMC, during lifeboat driving practicals, only two students were allowed to take part rather than the seven previously allowed. The lecturer paired the highly abled student with the lower abled student for better learning outcomes during lifeboat practicals. Webb (1989) discusses group work between highly able and lower ability students. Some students do not ask questions, even if an error occurs during the activity. During group work activities, such students learn from the interactions. It is possible that highly able students taking part actively in explanations to peers in the group can result in a high level of collaboration.

In Glasgow College, the lecturer sometimes used homework to help students to achieve learning outcomes. Grodner and Rupp (2013) revealed three benefits of homework assignments. Firstly, students have significantly higher retention rates in the course. Secondly, it improves test scores of poor students and thirdly, homework submission results in better test performance. During the ship simulator exercise, only two students could take part rather than five. Due to the smaller number of students, the lecturer took the role of the helmsman driving the ship. In this way, the lecturer could achieve similar learning outcomes as before COVID-19 with five students.

In KFUEIT, only five students were allowed during the laboratory experiments by mechanical engineers rather than the usual 25. The lecturer used to record videos of the practical components, which students could then watch later. Using modern learning tools by the lecturers were helpful to cover learning outcomes. Croker et al., (2010) discuss the advantage of using digital videos in laboratories to help students in independent learning and to enhance efficiency in laboratory work. During the pandemic, these institutes continued practical training in short courses by allowing smaller numbers of students. According to Dill (2018), students learn by observation: watching, thinking, reflecting, and understanding. Each element supports students in observing the practical activities of their peers to link theory and practice. Practicals are also a link between theory and practice. If students are attending face-to-face classes during the pandemic. In that case, students should be part of real practical work for better understanding, as long as all safety protocols are adhered to. Also, lecturers should use different ways to achieve learning outcomes through practicals, such as pairing low ability and high ability students, performing a role in ship simulator training, and using video technology. Video technology can be helpful for a better understanding of practicals. Croker et al. (2010) report that video technologies are efficient, flexible, and effective in guiding students through practicals.

In all three institutes, lecturers faced fatigue while delivering courses with all safety protocols due to the pandemic.

In Glasgow College, the lecturer suffered fatigue during teaching while wearing a face shield and taking a more significant number of short courses in a month. Also, there were seven hours of face-to-face teaching in a day. To manage fatigue and enhance lecturers' well-being, the lectures were split so that a lecturer took half classes face-to-face and half online from home, or another lecturer took half face-to-face teaching. In Glasgow College, the lecturer sometimes gave homework to students, which was helpful to reduce workload and fatigue. Sproles (2018) elaborates on student-centred teaching, noting that lecturers can design work to engage students rather than take full-time lectures. As a result, there is a reduction of workload in covering material during teaching. This is a student-centred pedagogy in which students are involved in more active learning. The lecturer has more control to take care of himself and engage students in hard work and more understanding.

At AMC, the lecturer suffered fatigue due to teaching whilst wearing a face mask with limited students in lifeboat practicals. According to Spitzer (2020), face masks produce symptoms of tiredness, vocal impairment, vocal fatigue and voice disorders. In KFUEIT, the lecturer faced fatigue due to delivering the same lecture online and face-to-face with the requirement for a limited number of students in class and laboratory experiments. At AMC and KFUEIT, lecturers manage fatigue by taking frequent breaks. These breaks were helpful in managing fatigue and wellness for lecturers and students. According to Biggs and Tang (2011), students' attention can be maintained for ten to

fifteen minutes. Taking a short rest or changing activities helps in restoring students' performance. All three institutes arranged different programs for the safety and wellness of students and lecturers.

At AMC, before joining campus, it was mandatory for students and lecturers to complete an online "A COVID-safe campus" module. Another module about the psychological impact and called "The path back from social isolation" was mandatory for students returning to campus from isolation. Also, to support students' wellness, there were meal and grocery vouchers and free laptops for Information Technology students. According to Kahu and Nelson 2018, students' wellness and success may be enabled by budgeting, psychological support, and life skill modules. In Glasgow College, there was a one-hour induction program on risk assessment for lecturers and students before returning to campus. Also, for students support and wellness, laptops were provided to every student during college study. At KFUEIT, there were seminars on safety and wellness for faculty members and students. Also, for students' wellness during COVID-19, there was an arrangement of batch advisors. So, during COVID-19, institutes can manage fatigue and wellness for students and staff by safety and wellness programs. While during the face-to-face study, the lecturers can manage fatigue by sharing the workload, student-centred teaching and taking frequent breaks.

Safe face-to-face teaching is possible if lecturers plan well to implement COVID-19 safety plans and manage fatigue. During such a pandemic, institutes must take care of the well-being and safety of faculty members and students through face-to-face and online programs. In addition, better learning outcomes can be achieved using technology for peer-to-peer interactions, group discussions and recording practical activities. Finally, Lateef (2020) describes how changes and upsurges cause upset and discomfort in human life. To cope with these challenges, preparedness, training, and planning are vital to managing people's mindset and reducing their psychological distress.

## **Limitations and conclusion**

This research is aimed to create safe COVID face-to-face teaching on campus. It explores challenges through critical reflections by lecturers from three different institutes in Australia, Pakistan and the United Kingdom.

Whilst the research reported demonstrates promise, there were some limitations in this reflection study. Firstly, it is a reflection study from only three participants from three different institutes. Data was not collected from students during COVID-19. Secondly, there were different situations of COVID-19 in all three countries, which meant different protocols like screening of students, availability of resources, and the number of students in each class. Also, students have different cultural backgrounds in the three different institutes, which affected students' motivation to learn during face-to-face teaching. Thirdly, there were differences in the practicals and number of students driving lifeboat practicals, working in the ship simulator, and doing experiments in the engineering lab. The first two practicals related to maritime study, whilst the third relates to mechanical engineering. During the data analysis, there were differences in the challenges faced by all three institutes due to their different courses and practicals, different COVID-19 safety protocols and different learning outcome requirements.

Based on those limitations, this research is limited to reflective reports of the three participants. Data was based on open-ended questionnaires completed by these participants in which two participants were from maritime institutes, and one was from a non-maritime engineering institute. By comparing and contrasting observations from the lecturers and literature, it is possible to run face-

to-face teaching on campus during a pandemic with all COVID-19 safety protocols. As this is only a reflective report from three participants, further research is needed to ensure validated data.

### **Recommendations**

The above report is based on a small sample of data from reflective reports. In future, research can be done by collecting data from more participants, as well as students who participated in the face-to-face study during the pandemic. Next time, a different methodology could be used for collecting and analysing data, such as qualitative and quantitative, to provide more reliable data.

Research can be done with similar courses in different institutes. For example, in maritime institutes, data can be collected based on the same course, such as a survival course. In this case, all maritime institutes have almost similar requirements of teaching, practicals and learning outcomes. Research can be conducted on students with similar cultural backgrounds in different institutes.

### **Declaration of Conflicting Interest**

All three authors declare that they have no actual or perceived conflicts of interest to report.

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