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## The impact of COVID-19 on the private higher education system and students in Oman

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## Abstract

The outbreak of novel coronavirus (COVID-19) worldwide has had a significant impact on the global higher education community. The governments around the world adopted social confinement measures to combat COVID-19, which has resulted in the closure of higher education institutions. Faced with multiple challenges, faculties rapidly converted curriculum to an online environment, which is anticipated to occur without sufficient preparation. Therefore, this study conducted a survey of students in post-secondary private institutions throughout Oman, to understand different approaches adopted by academic institutions to deliver education during the COVID-19 restriction, and the consequences of these restrictions on academic activities and quality of education. Moreover, the extent to which personal and financial circumstances have created challenges for students to continue their education is also analyzed. A total of 213 respondents completed the study, which were overrepresented by students enrolled in bachelors programme. The student satisfaction from the arrangement and delivery of education online was not more than 50 percent. The exams were cancelled and replaced by extra coursework in most cases, and in some cases students were assessed based on only the existing coursework. The major concern for many students (40%) was the inability to pay tuition fees due to the financial implication caused by the COVID-19 pandemic.

## Keywords

COVID-19 pandemic, higher education institutes, distance learning, education quality



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## **The impact of COVID-19 on the private higher education system and students in Oman**

### **Abstract**

The outbreak of novel coronavirus (COVID-19) worldwide has had a significant impact on the global higher education community. The governments around the world adopted social confinement measures to combat COVID-19, which has resulted in the closure of higher education institutions. Faced with multiple challenges, faculties rapidly converted curriculum to an online environment, which is anticipated to occur without sufficient preparation. Therefore, this study conducted a survey of students in post-secondary private institutions throughout Oman, to understand different approaches adopted by academic institutions to deliver education during the COVID-19 restriction, and the consequences of these restrictions on academic activities and quality of education. Moreover, the extent to which personal and financial circumstances have created challenges for students to continue their education is also analyzed. A total of 213 respondents completed the study, which were overrepresented by students enrolled in bachelors programme. The student satisfaction from the arrangement and delivery of education online was not more than 50 percent. The exams were cancelled and replaced by extra coursework in most cases, and in some cases students were assessed based on only the existing coursework. The major concern for many students (40%) was the inability to pay tuition fees due to the financial implication caused by the COVID-19 pandemic.

### **Keywords**

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On 31 December 2019, an infectious respiratory disease emerged in Wuhan, Hubei Province, China (Huang et al., 2020; Marinoni & Land, 2020). The Wuhan Health Committee reported 27 pneumonia cases, which were detected as novel coronavirus (2019-nCoV or COVID-19) by the Laboratory of Virology, Chinese Centre for Disease Control and Prevention on 7 January 2020 (Wang et al., 2020). Since then, the cases of COVID-19 substantially grew across the globe, and the World Health Organisation declared it a pandemic on 11 March 2020 (Marinoni & Land, 2020).

With the spread of the COVID-19 countries across the globe have adopted abundant measures to restrain further spread as there are no specific vaccine or treatment for COVID-19 (Mohammed et al., 2020). This has led to governments declaring lockdown and working from home becoming the norm. More than 3.4 billion people around the world – representing 43 percent of the world population – were under lockdown in more than 80 countries on 1 April 2020 (Marinoni & Land, 2020). Following government instructions, even the academic universities and institutions had to temporarily shut down, affecting their normal progression (Arora & Srinivasan, 2020; The World Bank, 2020). On 13 April 2020, 194 countries enforced country-wide closure of educational institutions while few countries implemented localised closure, consequently affecting 1.57 billion students. Moreover, as of 3 July 2020, around 111 countries are still under country-wide closure of educational institutes and 42 countries have moved from country-wide closures to a localized approach, still impacting more than 1 billion students around the world. However, few countries, such as Australia, New Zealand, and South Korea, have been able to open all educational institutions due to the decline in infection rates (UNESCO, 2020).

The COVID-19 pandemic is still evolving, and some countries are currently reporting their highest daily cases, it seems that these countries will likely continue with the closure of educational institutes until the infection rate decline or a vaccine is available (Reimers et al., 2020). Therefore, many countries are currently practicing the initiative *Suspending Classes without Stopping Learning* which was launched by China to curb the loss of student learning while educational institutes are closed (Zhang et al., 2020). Most of the academic institutes and universities around the world adopted diverse approaches to convert curriculum to online environment, with the assistance of educational websites and digital tools (Zhaohui, 2020). However, this sudden transition to online teaching brought ambiguity and disagreement about the approach to teach, the teaching environment, the workload of teachers and students, practical classes and most importantly implications for education equity (Quacquarelli Symonds, 2020; Zhang et al., 2020). Moreover, among the major challenges unfolded with the remote learning was the rapid digitalization of curriculum (Crawford et al., 2020). Overall, this abrupt transition to remote teaching proved to be the real test for the organisational agility (Zhaohui, 2020). Institutions had the challenge to not only continue the provision of education through online courses but to also maintain the core principles and retain quality (McInnes et al., 2020).

Some institutions were able to rapidly innovate and implement online learning due to their familiarity with teaching approaches and necessary tools, resulting in less disruption for many students unable to attend in-person classes (Houlden & Veletsianos, 2020). However, educational institutions lacking the infrastructure and necessary tools impacted the learning of students, and the socially disadvantaged students with limited to no access to technology and the internet impacted institution's response or their own ability to involve in an online environment (Crawford et al., 2020). In some countries, such as Brazil, limited access to internet for students resulted in complete closure of higher education institutions because transition to online teaching would only benefit a very small proportion of students, hence perpetuating a huge inequality in opportunities (Marinoni & Land, 2020).

Similarly, Oman was also not left untouched by the COVID-19 as it reported its first case on 25 February 2020, and the country since then started seeing a steady rise in infection rate. The government in an attempt to protect public health swiftly implemented a country-wide closure of educational institutes on 15<sup>th</sup> March, 2020, and encouraged distance learning initiatives (UNESCO, 2020). Initially, the closure of educational system was imposed for two weeks (Paldavičiute, 2020), but with the rise in cases the duration of this measure has been extending. Oman saw a drastic increase in the number of COVID-19 cases in the month of July, where a total of 39,197 cases were reported (Worldometer, 2020). As of 31 August 2020, the total cases in Oman have reached 85,722, but a sharp decline in the number of COVID-19 cases is observed since the end of July (Worldometer, 2020). However, online delivery of courses seems to stay for a while as the country is starting the new academic year with hybrid learning approach.

The abrupt transition to online learning did not allow academic institutions to conduct a normal policy-making process before adopting the online delivery mode, due to which the implementation conditions and process, and the effects of the policy remain unclear (Zhang et al. 2020). Hence, to deliver high quality education during these uncertain times it is vital that universities consistently communicate with students to understand their needs and concerns, and leverage the latest digital tools. Therefore, this study aims to assess the current delivery of education in post-secondary private institutions in Oman to better understand different approaches implemented, their potential benefits and challenges, and overall satisfaction of student's with remote teaching to improve the educational system. Furthermore, this study attempts to determine the extent to which other personal and financial factors may deter students from pursuing their education in private institutions in Oman during these unprecedented times.

## **Method**

A cross-sectional study was conducted from 19 July 2020 until 15 August 2020. The survey was emailed to the leaders of all private higher education institutes (HEIs) after the approval of the Ministry of Higher Education in Oman to further distribute the survey among students. The survey focused on the online class and lab class delivery methods adopted by private academic institutions in Oman, variation in workload, type of examination, teaching support, student performance, effects on skills and research activities of students, and overall satisfaction of students with the current remote learning. Furthermore, survey inquired about personal and financial circumstances of students and how they are effecting them in continuing their education. The reliability of the questionnaire was calculated using Cronbach Alpha. Statistical analysis of the collected data was performed using IBM SPSS Software.

## ***Ethical considerations***

The Institutional Review Board of Ministry of Higher Education of Sultanate of Oman provided approval on the questionnaire before distributing to the students in private higher education institutions. All participants gave their informed consent in the questionnaire to participate in the study after being informed about the purpose of the study. The procedures of this study complied with the provisions of the Declaration of Helsinki regarding research on Human participants.

## Result and discussion

The survey analysis is based on 213 valid responses from students enrolled in private HEIs in Oman. The academic characteristics of the respondents are given in Table 1. The profile of respondents is overrepresented by 68.5 percent students enrolled in a Bachelor degree, while students in Diploma and Masters courses were 19.7 percent and 11.7 percent, respectively. Similarly, most respondents were enrolled in courses in the field of Engineering and Related Technology (27.2%), Management and Commerce (27.7%), and Information Technology (21.1%), whereas the field of Health and Society and Culture were underrepresented with just 3.8 percent and 0.5 percent responses, respectively. Meanwhile, 19.7 percent respondents preferred not to disclose their field of education.

**Table 1**

*Academic characteristics of the respondents*

		Engineering and Related Technology	Management and Commerce	Health	Information Technology	Society and Culture	No Answer	Total
Study Level	Diploma	12	16	0	3	1	10	42
		5.6%	7.5%	0%	1.4%	0.5%	4.7%	19.7%
	Bachelors	45	35	8	27	0	31	146
		21%	16.4%	3.8%	12.7%	0%	14.5%	68.5%
	Masters	1	8	0	15	0	1	25
		0.5%	3.8%	0%	7%	0%	0.5%	11.8%
Total		58	59	8	45	1	42	213
		27.2%	27.7%	3.8%	21.1%	0.5%	19.7%	100%

### **Online methods adopted for distance learning**

All respondents reported that instead of relying on one method, their academic institution have opted for a combination of online live lectures (video and audio conference), video recorded lectures and presentations with audio explanations to deliver lectures. The remote learning method used by private HEIs in Oman and satisfaction of students with each method is summarized in Table 2. Out of total 213 respondent, 98.6 percent informed that their lecturers upload presentations with audio explanation online, 98.12 percent respondents received video recorded lectures online, and 94.4 percent and 93.4 percent respondents attended live audio and video conferences online, respectively. When enquired about the most frequent method of delivering lectures, video conference emerged as the most popular method as indicated by 48.4 percent respondents, followed by audio conference (26.8%), video recorded lectures (14.08%), and presentation with audio explanation (10.8%). Findings show that not only all private HEIs had infrastructure to move to online teaching, but were also able to opt for different approaches to deliver lectures.

In terms of satisfaction with the delivery of lectures, highest satisfaction was observed with video recorded lectures uploaded online, as 55 percent of the total 209 students were satisfied to very satisfied, as opposed to 30 percent which were either dissatisfied or very dissatisfied. The higher satisfaction of students with video recorded lectures is may be due to the ability to watch lectures at the desired time and to refer back to lectures whenever needed. Student's second highest satisfaction was reported for online live video conference where out of 199 students almost 45 percent found them satisfactory compared to 36 percent which were not content with the method. Whereas, similar proportion (around 40%) of students found presentations with audio explanation and online live audio conference satisfactory and dissatisfactory out of the total 210 and 201 students, respectively.

Results show that neither of the methods of online class delivery, as discussed above, received satisfaction from more than half of the students attending them. Moreover, from 15–20 percent were not sure about their satisfaction with the online class delivery methods.

**Table 2**

*Online methods used for the delivery of classes and student satisfaction with the classes*

	Very Satisfied	Satisfied	Neutral	Dissatisfied	Very Dissatisfied	Total	Frequently used
Online live lectures (Video conference)	35 16.4%	54 25.4%	38 17.8%	44 20.7%	28 13.1%	199 100%	103 48.4%
Online live lectures (Audio conference)	39 18.3%	47 22.1%	40 18.8%	52 24.4%	23 10.8%	201 100%	57 26.8%
Video recorded lectures uploaded online	57 26.8%	58 27.2%	31 14.6%	34 16%	29 13.6%	209 100%	30 14.08%
Presentations uploaded online with audio explanation in background	48 22.5%	43 20.2%	35 16.4%	39 18.3%	45 21.1%	210 100%	23 10.8%

### **Assessments and workload**

The new examination style adopted by private academic institutions in Oman and changes in the workload of students since the onset of COVID-19 pandemic are displayed in Table 3. As much as 52 percent of the total students responded to the survey reported that their final examination is replaced by extra coursework, 35 percent informed that their institutions are assessing them for final grade only based on the existing coursework, almost 11 percent stated that final exams are replaced by online open book exams, 0.9 percent indicated that their exams are still on site, 0.5 percent reported that they are having viva quiz along with assignments and additional 0.5 percent stated that teachers are assigning grades based on the existing coursework but are also considering the challenges students might face in terms of access to technology (internet, computer etc.) to complete assignment.

The other aspect highlighted in the survey was about the change in workload since the cancellation of exams and shift to remote learning. It was reported by 56.3 percent respondents, out of total 213, that their workload has been increased to significantly increased, which is also reflected by the extra coursework provided to 32.3 percent of students due to the cancellation of exams. Moreover, 23.5 percent of the total respondents informed that their workload has been reduced to significantly reduced, of which 40 percent (out of 50 students) reported that they are receiving their final grades based on the existing coursework and 46 percent despite receiving extra coursework still does not consider it close of the regular workload. Whereas, out of the total 213 respondents, only 18.8 percent students considered the workload similar to the workload before the cancellation of exams.



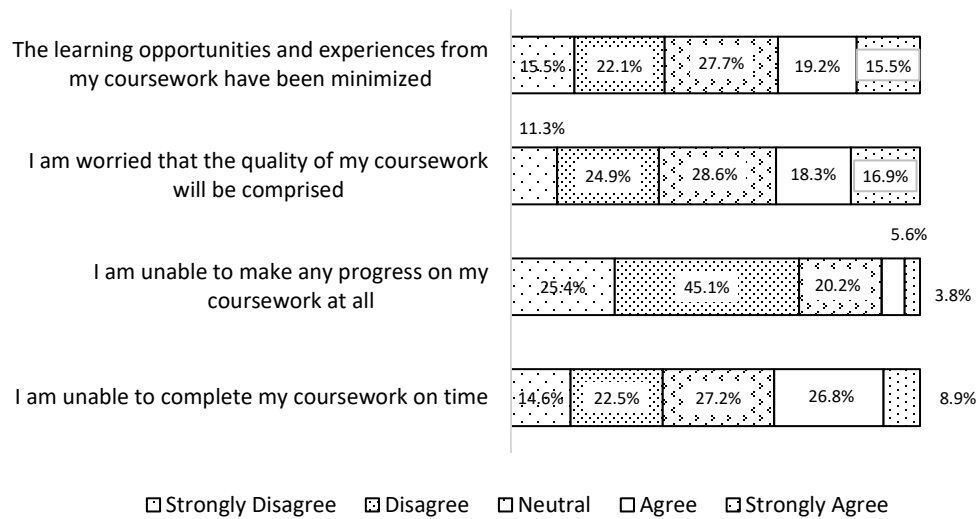
**Table 3***New examination style and changes in student workload since the onset of COVID-19*

Exam Type	Significantly Higher	Higher	Same	Smaller	Significantly Smaller	No Answer	Total
Only based on existing coursework	15 20%	20 26.7%	17 22.7%	14 18.7%	6 8%	3 4%	75 100%
Extra coursework provided	33 29.7%	36 32.4%	19 17.1%	18 16.2%	5 4.5%	0 0%	111 100%
Online open book exams	8 34.8%	5 21.7%	4 17.4%	1 4.3%	5 21.7%	0 0%	23 100%
Still on site	2 100%	0 0%	0 0%	0 0%	0 0%	0 0%	2 100%
Viva quiz and assignments	0 0%	1 100%	0 0%	0 0%	0 0%	0 0%	1 100%
Based on existing coursework (while considering student access to technology)	0 0%	0 0%	0 0%	1 100%	0 0%	0 0%	1 100%
Total	58 27.2%	62 29.1%	40 18.8%	34 16%	16 7.5%	3 1.4%	213 100%

**Constraints in working and teacher's response**

With coursework comprising 100 percent of the marks in most of the cases it is very important to understand whether students can complete their assignments during these unprecedented times. Figure 1 presents the problems and constraints students are facing in doing assessments (coursework) in Oman. Of the total respondents, 35.7 percent students reported that they might not be able to complete their coursework on time, while 27.2 percent were not sure about it. Though, only 9.4 percent students informed that they are not able to make any progress on their coursework. Around 35.2 percent students also agreed that they feel the quality of their assignments will be comprised and learning opportunities will be minimised due to certain constraints, while 36.2 percent disagreed with the notion and around 28 percent of the total respondents were neutral about it.

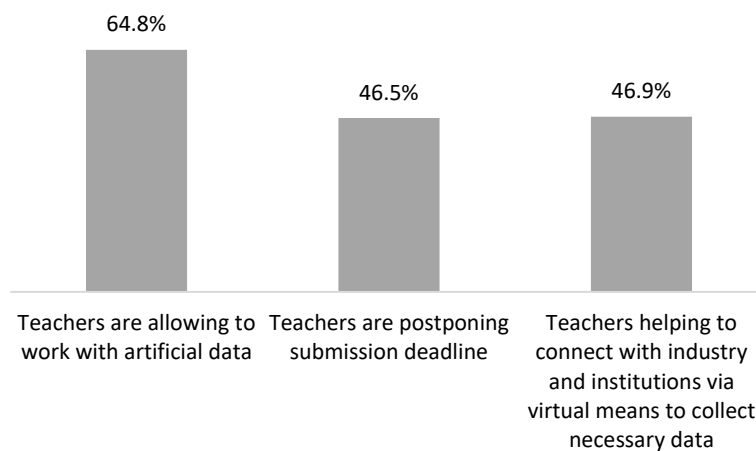
**Figure 1***Constraints faced by students in coursework since the onset of COVID-19*



To address the issue, 64.8% of the total 213 students indicated that teachers are allowing them to work with artificial data to meet deadlines, 46.9% admitted that teachers are assisting them to connect with industry and institutions via virtual means to collect data essential for completing assignments, 46.5% reported that teachers are going as far as postponing deadlines to facilitate students (Fig. 2). This shows that students are facing challenges, but teachers and academic institutions are trying their level best to help those in stressful situation.

**Figure 2**

*Teaching support to overcome challenges in completing coursework*



### ***Delivery of lab classes and exams***

Many educational fields have practical element for which lab classes are in place to help students experience the application of theory in reality. Whereas, certain field of studies are dependent on

specific technical equipment that is only accessible in laboratories, hence making the replacement of onsite lab classes is mostly impossible by distance learning without affecting the quality of education.

Consequently, this is an important challenge reported as more than half of the respondents (54%) have lab classes, as shown in Table 4, and of those 115 students almost 56.5 percent students indicated that their lab classes are shifted online, 30.4 percent students informed that their lab classes are cancelled until the restart of in-person classes, while 12.2 percent indicated that lab classes are shifted online but have requirement in place to perform experiments once in-person classes resume. Whereas, one student reported that lab classes for some modules are shifted online while for other modules they are totally cancelled. Results show that a little over 70 percent students reported that their lab classes are taking place in different online forms. Therefore, conducting the more practical elements of a study is a challenge and even the lab classes delivered during lockdown are often limited to the theoretical element of the course.

**Table 4**

*Proportion of students with lab classes and the effects of COVID-19 on the delivery of lab classes*

		Lab classes cancelled until the restart of in-person classes	Lab classes are also shifted online	Online lab classes but complete experiments after restart of in-person classes as graduation requirement	Lab classes are shifted online for some modules and cancelled for others until the restart of in-person classes	Not Applicable	Total
Lab classes	Yes	35	65	14	1	0	115
		30.4%	56.5%	12.2%	0.9%	0%	100%
	No	0	0	0	0	98	98
		0%	0%	0%	0%	100%	100%
Total		35	65	14	1	98	213
		16.4%	30.5%	6.6%	0.5%	46%	100%

Moreover, it was reported that lab exams of 57.4 percent students shifted to coursework, 32.2 percent informed that they are cancelled, 7 percent and 3.5 percent indicated that lab exams are delayed and shifted online respectively (Table 5). Certainly, where possible, transition from practicing in groups to practicing in isolation still cannot be made at the same level. Institutions where technical infrastructure is enabling online teaching and learning is also reliable, the preservation of the quality of the learning experience will very much depend from one field of study to other during the COVID-19 restrictions.

**Table 5**

*Impacts of COVID-19 restrictions on the arrangement of lab exams*

Lab Classes	Cancelled	Delayed	Shifted to coursework	Online	Total
Lab classes cancelled until the restart of face-to-face teaching	17	3	14	1	35
	30.4%	56.5%	12.2%	0.9%	100%
Lab classes are also shifted online	18	3	41	3	65
	27.7%	4.6%	63.1%	4.6%	100%

Online lab classes but complete experiments after restart of in-person classes as graduation requirement	2 14.3%	2 14.3%	10 71.4%	0 0%	14 100%
Lab classes are shifted online for some modules and cancelled for others until the restart of in-person classes	0 0%	0 0%	1 100%	0 0%	1 100%
Total	37 32.2%	8 7%	66 57.4%	4 3.5%	115 100%

Table 6 displays the satisfaction of students from different fields of study with the arrangement of lab classes; students whose lab classes were delayed until the restart of face-to-face teaching were asked to choose not applicable. Results depict that the field of Engineering and Related Technology was the hardest hit by the COVID-19 safety measures as the lab classes of 34.2 percent of the total 38 students were delayed, followed by the Information Technology field where lab classes of 30.8 percent students (out of 26) were postponed, and 21.7 percent out of the total 23 students in Management and Commerce field faced suspension of practical classes until the restart of in-person classes. Considerable amount of students who chose not to specify their field of education had their lab classes delayed. On the other hand, no one from the Health field reported suspension of practical classes. Moreover, the overall satisfaction of students with the arrangement of lab classes on the Likert scale of 1 (very satisfied) to 5 (very dissatisfied), showed that almost similar proportion of students were satisfied and dissatisfied with it in all fields of education. The mean of Likert scale for overall satisfaction of all respondents with practical classes was 3.12, whereas in the Engineering and Related Technology field it was 2.94 and for rest of the educational fields it was 3.00.

**Table 6**

*Student satisfaction with the arrangement of lab classes based on field of education*

	Very Satisfied	Satisfied	Neutral	Dissatisfied	Very Dissatisfied	Not Applicable	Total
Engineering and Related Technology	3 7.89%	11 28.94%	0 0%	8 21.05%	3 7.89%	13 34.2%	38 100%
Management and Commerce	3 13%	6 26.09%	0 0%	7 30.4%	2 8.7%	5 21.7%	23 100%
Health	1 12.5%	3 37.5%	0 0%	1 12.5%	3 37.5%	0 0%	8 14.08%
Information Technology	3 11.5%	5 19.2%	1 3.85%	7 26.9%	2 7.69%	8 30.8%	26 100%
No Answer	1 5%	3 15%	0 0%	3 15%	4 20%	9 45%	20 100%
Total	12 10.4%	34 29.6%	1 0.87%	34 29.6%	18 15.7%	16 13.9%	115 100%

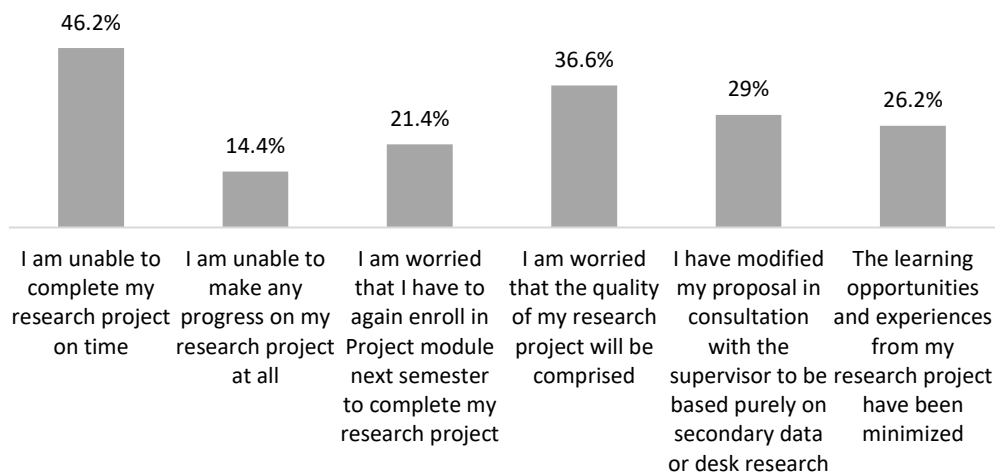
### **Pursuance of research activities and limitations**

About 68 percent of the students that responded to the questionnaire are pursuing research projects. When enquired about how their research supervision is conducted, it was reported that supervisors connect via audio and video calls, and email. In terms of satisfaction with the research supervision, almost similar proportion of students were satisfied and dissatisfied, which is also indicated by the mean of 2.99 on the Likert scale of 1 (very satisfied) to 5 (very dissatisfied).

The most common impact of COVID-19 on research has been the uncertainty about completing the research project on time (at 46 percent of the total 145 research students), as displayed in Fig. 3, though only 14.4 percent of research students reported that their research activities are totally halted and they are not able to make any progress. However, 21 percent of students confessed that they might have to take project module again next semester due to the delay in their essential research activities. Almost 36.6 percent of students also agreed that they feel the quality of their research project will be comprised due to constraints in conducting research as planned. This is also reflected by 29 percent students admitting of modifying their research proposals in consultation with their supervisors to completely base their research on secondary data or desk study. Whereas, 26.2 percent of the total research students agreed that the learning opportunities from their research projects are minimized as a result of COVID-19 restrictions.

**Figure 3**

*Constraints faced by students in research since the onset of COVID-19*

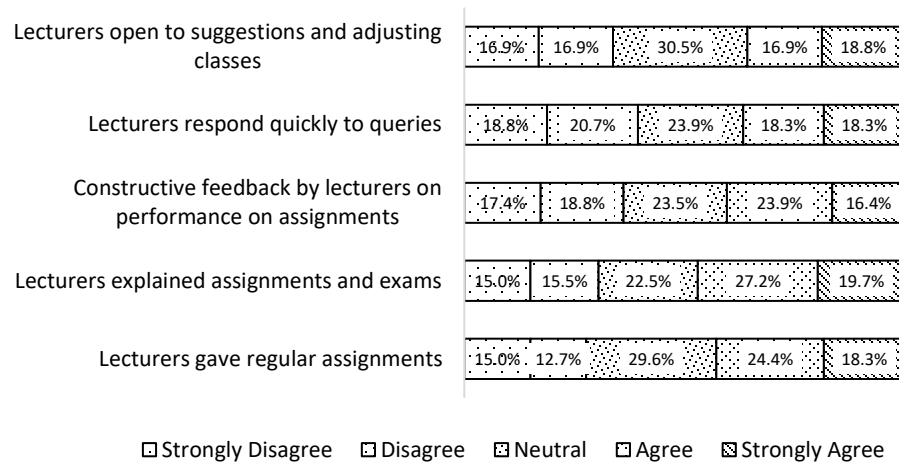


### **Teaching quality and support**

Out of the total 213 respondents, 46.9 percent agreed that lecturers were very supportive and made sure that students have a clear understanding about their assignments and how exams will look like, while 30.5 percent disagreed with the notion. Moreover, 42.7 percent and 40.4 percent students informed that lecturer keep them engaged by regularly providing them assignments and provide constructive feedbacks on their performance and assignments, respectively, in contrast to 27.7 percent and 36.2 percent who disagreed with the statement respectively (Fig. 4). However, similar proportion of students agreed and disagreed that lecturers quickly respond to their queries (38%) and are open to suggestions in adjusting classes (34.8%), whereas 23.9 percent and 30.5 percent neither agreed nor disagreed, respectively. In terms of teaching quality and support from teachers, the positive response in almost all factors was higher than the negative responses, while 22.5–30.5 percent students stayed neutral.

**Figure 4**

*Teaching quality and support*

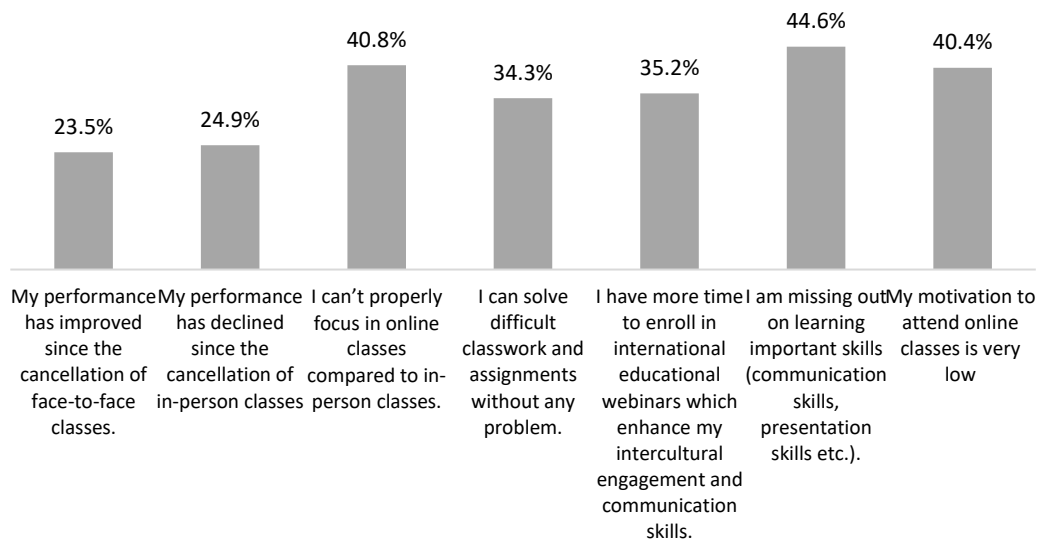


### ***Impacts on performance and skills learning***

The major impact that emerged was the lack of learning important skills such as communication and presentation skills, and confidence to interact with people, as indicated by 44.6 percent out of the total 213 students (Fig. 5). However, 35.2 percent students reported that distance learning save them lots of time which they can use for other productive activities like joining international education webinars which adds to their intercultural engagement and communication skills. The other main impacts on student learning, as reported by 40.8 percent and 40.4 percent students, were lack of concentration in online classes and very low motivation to attend online classes as compared to in-person classes, respectively. In terms of performance in studies, 24.9 percent students acknowledged that their performance has declined since the onset of distance learning. Whereas, improvement in performance and ability to solve difficult assignment was reported by 23.5 percent and 34.3 percent students, respectively.

### **Figure 5**

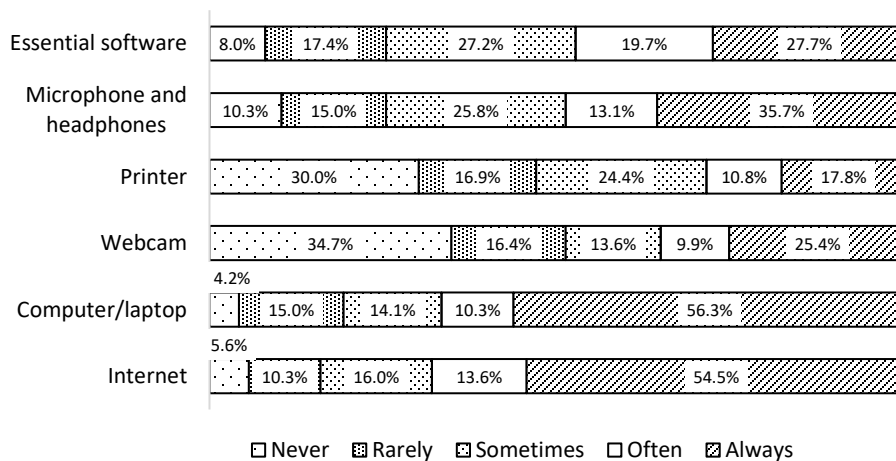
*Impacts of COVID-19 restrictions on student performance and skill learning*



### Technological challenges

Figure 6

Student access to essential technology



The access to essential technical equipment is a prerequisite for attending online classes, and lack of availability can lead to unequal opportunities for students to complete their academic year successfully. Figure 6 shows that more than half of the total students responded to the survey reported that they always have access to internet (54.5%) and computer/laptop (56.3%), and more than 10 percent and around 15 percent indicated that they have access often and sometimes, respectively. Though, the data is encouraging but the 4–6 percent of students never having access

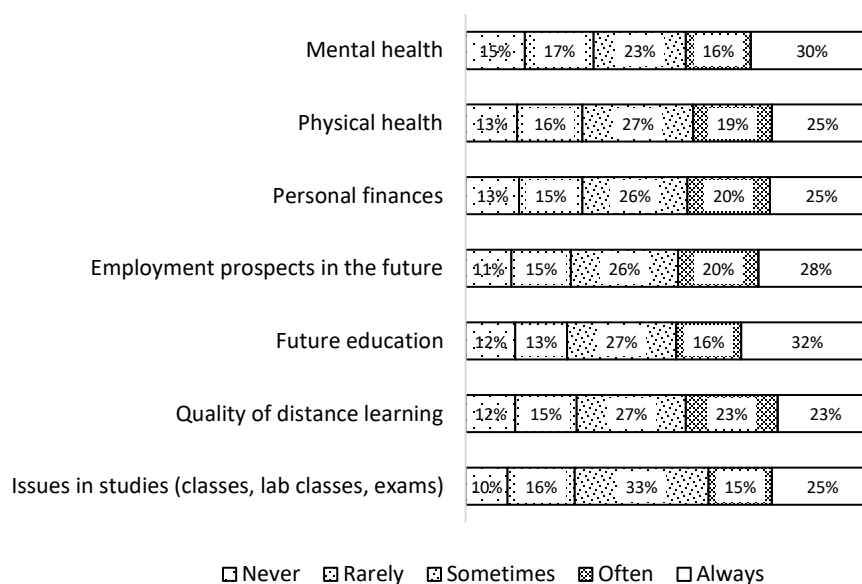
and 10–15 percent of students rarely having access to internet and computer/laptop, respectively, is still worrisome. The availability of webcam and printer were the lowest among all technical equipment, where more than 30 percent students reported of never having access and around 16 percent rarely having access. Out of the total 213 respondents, 47.4 percent and 48.8 percent informed that they always or often have access to essential software and microphone/headphones respectively, a little over quarter (27.2% and 25.8%, respectively) stated that they sometime have them, while a quarter (25%) of students indicated that they either never or rarely have access to these items. Frequent availability of some of these technical item (internet and computer/laptop) are very essential for all fields of education to ensure participation in online classes and completion of assignment. However, in some educational field having frequent access to essential software is also equally important, which data suggest is not the case.

Another important issue, as reported by 16 percent students of the total respondents, was identified to be students' lack of confidence on their computer skills to cope with distance learning, and other 22 percent not being sure about it. This makes easy transition to distance learning problematic not only for the students but also for the institutions. However, 60 percent students showed confidence on their computer skills to smoothly shift to distance learning.

### **Personal and financial circumstances**

**Figure 7**

*Different aspects worrying students during the COVID-19 restrictions*



Following the onset of the COVID-19 pandemic, out of the total 213 students 69–75 percent reported increase in stress due to uncertainty about their future education and employment prospects, quality of distance learning and issues in studies, and other factors like personal finances, physical and mental health, as summarised in Fig. 7. Most students, around three-fourth (75%), worried about future employment prospects and education, around 73 percent were stressed about the quality of



distance learning and issues in studies. While, 71 percent were concerned about their physical health and personal finances, and due to the increased stress in general, 69 percent believed that the current situation is deteriorating their mental health. On the other hand, 25–32 percent reported that they either never or rarely stress about any of the above mentioned situations.

**Table 7**

*Proportion of students facing problem in paying fees due to COVID-19*

	Problem in Paying Fees		Reason for Financial Problem						
	Yes	No	Lost job	Salary reduced to half	Parents facing financial problems due to COVID-19	Scholarship cancelled	Payment of scholarship postponed	Business affected badly	No Answer
On my own	23	38	2	9	0	0	0	2	10
	37.7 %	62.3 %	3.3 %	14.8 %	0	0	0	3.3 %	14.8 %
Parents	51	15	0	0	48	0	0	0	3
	77.3 %	22.7 %	0 %	0 %	72.7 %	0 %	0 %	0 %	4.5 %
Government Scholarship	3	66	0	3	0	0	0	0	0
	4.3 %	95.7 %	0 %	4.3 %	0 %	0 %	0 %	0 %	0 %
Other Scholarship	8	7	0	0	0	2	6	0	0
	53.3 %	46.7 %	0 %	0 %	0 %	13.3 %	40 %	0 %	0 %
Me and my Parents	0	1	0	0	0	0	0	0	0
	0 %	100 %	0 %	0 %	0 %	0 %	0 %	0 %	0 %
No Answer	0	1	0	0	0	0	0	0	0
	0 %	100 %	0 %	0 %	0 %	0 %	0 %	0 %	0 %
Total	85	128	2	12	48	2	6	2	13
	40 %	60 %	0.9 %	5.6 %	22.5 %	0.9 %	2.8 %	0.9 %	6.1 %

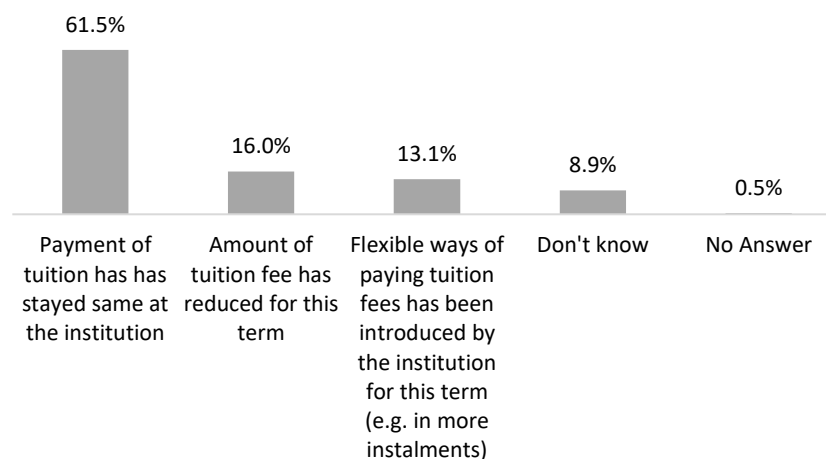
The COVID-19 pandemic brought financial implications for many, which is also one of the major challenge that students are facing due to either losing jobs, getting lower salaries or their parents facing financial problem. The financial problems students are facing in Oman are presented in Table 7. Among all respondents, students dependent on their parents are impacted the highest as 77.3 percent of the total 66 are facing problem in paying their tuition fees because their parents are having financial problems due to COVID-19. The second hardest hit are students on other scholarships, where 53.3 percent students out of total 15 are facing problem as scholarships have been postponed for most students (6 students) and cancelled for some (2 students). Students paying on their own have also not been spared by the financial impact as 37.7 percent among the total 61 students are either having their salary reduced to half (9 students), have lost their job (2 students) or are facing business issues (2 students). The low impact can be seen on students with government scholarship, where only 4.3 percent student are facing problem due to the reduction in their salary. Overall, the

result show that almost 40 percent of the total students responded to the survey are facing problem in paying their tuition fees.

When asked about the changes in the payment of tuition fee since the onset of COVID-19, 61.5 percent of the total respondents reported that the payment of tuition fee has stayed the same at their institution, 16 percent informed that their institution has reduced the tuition fee for the current semester, 13 percent stated that their institution has introduced flexible ways to pay tuition fee for the current semester (Fig. 8).

**Figure 8**

*Changes in payment at academic institution*



## Discussion

The higher education system of Oman currently includes 27 private colleges and universities with an enrollment of around 35,000 students (Ministry of Higher Education, Research & Innovation, 2020). Even prior to COVID-19 pandemic, private HEIs throughout Oman already had web based systems in place to post all course materials, audio or video recorded lectures, and facilitate submission of coursework online. The course management system such as Moodle is one of the example to support more content and student collaboration. Colleges and universities in Oman were already taking steps to enhance technical literacy and further strengthen the culture of using computers, smart devices and other innovative tools in their curriculum (Rollakanti et al., 2020), as the application of information and communication technology makes delivery of education more efficient and productive (Baporikar, 2013). Farag (2018) and Abushammala (2019) already studied the use of classroom management software and online peer assisted learning in Oman, respectively, to enhance teaching practices and performance of students. Also, Chen et al. (2020) indicated that the availability of online education platform system has the highest influence on student satisfaction.

Findings of this study show that the availability of infrastructure in place has assisted academic institutions to cope with the abrupt transition to online learning in an excellent way as they opted for a combination of different approaches to deliver lectures. This is a positive indication because each method of online delivery has its own pros and cons, and a combined delivery could overcome

problems faced by the students. For instance, student may face issues in understanding the solution procedures of mathematical problems in presentations with audio explanations (Mohammed et al., 2020), but such content can be delivered via video recorded lectures or video conferences. Similarly, the element of raising questions and clearing doubts is not present in a video recorded lecture (Mohammed et al., 2020), however combining it with online lectures can solve the problem. High satisfaction was observed with the video recorded lectures or presentations uploaded on the system with explanation. Mostly students have positive perception about pre-recorded lectures because it allows them to access the lecture content flexibly (Dianati et al., 2020). Although, on average a little over one third student found the online lecture delivery unsatisfactory, this could be because of the lack of understanding of content in certain discipline where practical experience is a vital element or due to lack of proper focus and motivation. Day et al. (2020) reported that many students in Okanagan College in Canada lacked a quiet home space, which caused problems while attending lectures online. Discipline and commitment are required to focus on lectures but many indigenous elements like family interference, noise, household work and visitors that exist in home environment could result in lack of proper focus to attend lectures and motivation to learn as opposed to classroom environment (Day et al. 2020). All these factors also directly affects the performance of students, which has been reported in this study by almost a quarter respondents. Therefore, students should arrange a proper setup free from any external distraction to ensure effective learning in home setting, as resumption of classes at full capacity seems distant for a while due to evolving COVID-19 situation.

The study also depicts that most of the students in Oman are well equipped with necessary technological tools to participate in remote learning. The access to basic technological tools among most of the students can be justified by the culture of using computers and innovative tools in curriculum. Access to technological equipment was also echoed in the most of the online education survey conducted in the past (Gormley et al. 2009; Harris et al. 2009; Gillingham and Molinari, 2012). However, Arora and Srinivasan (2020) indicated that due to lack of awareness and teacher's training, and network issues many did not adopt virtual learning in India after the onset of COVID-19 pandemic. Similarly, QS-ERA (2020) reported that the current state of technological infrastructure in India is not capable to deliver online classes effectively, and Misha (2020) raised concern about the digital divide among students. In cases where lack of training of academic staff affects the uptake of virtual learning, approaches where educational developers can collaborate with academic staff can be adopted. In this method, educational developers help academic experts to in creating the online courses (Croxford et al., 2019). The students' confidence in the use of technology in the present survey was higher than what was reported by Gillingham and Carol Molinari (2012), which is due to increase in awareness and the higher use of technology with time, especially in Oman. On the other hand, quite a small percentage of students reported of not having basic facilities such as computers and internet. Students sometimes rely on technological equipment provided in academic institutions to meet their needs rather than possessing those tools, and with the closure of institutions their educational progression may be halted. In such cases, it is advised that academic institutions and government try to help such students by providing free laptops and internet facilities. Government is already working towards the provision of telecom and internet services in rural areas of Oman which will further solve the issue of connectivity.

Previous studies, such as Young and Norgard (2006) and Yang and Cornelius (2004), conducted surveys on the satisfaction of students from online course delivery when COVID-19 pandemic was not present. Therefore, the online courses were properly planned and designed for distance education. Moreover, the students enrolled in those courses preferred distance learning due to its convenience and flexibility (Young and Norgard, 2006; Yang and Cornelius, 2004; Zhang and Perris, 2010). This also resulted in higher student satisfaction as opposed to the current situation

with COVID-19 pandemic where students who registered in face-to-face classes were forced to move to distance learning. Most of the students who enroll in in-person classes prefer not to be taught online (Day et al., 2020). Moreover, abrupt transition to online teaching resulted in lack of preparation of institutions and teachers, and in most cases, time to consult with students before transition to online classes was insufficient (Day et al., 2020). The current survey highlights the problems with the organisation of practical classes and exams that were either cancelled or postponed in many cases. Other aspect highlighted in the study was the increase in workload, which is mainly because of the substitution of almost all exams by coursework. When developing curriculum for the online courses effective evaluation of the process must be conducted (McInnes et al., 2020). This is understandable that an abrupt transition to remote learning and teaching may have resulted in gaps in terms of maintaining the balance of workload in curriculum. Chen et al. (2020) also indicated that unexpected transition to online teaching causes problems such as how to conduct online teaching as per the plan, and how to monitor the effects and quality of online teaching, which results in lesser student satisfaction. Therefore, institutions and teachers should consult with students to learn about their experiences with the current assessment modes to address the issues. Though online learning is a powerful way of teaching, and successful implementation of such methods requires a well-planned strategy and active approach (Bączek et al., 2020).

The cancellation or online delivery of lab classes emerged as a major problem in the current survey for programs involving practical element. Experiential learning allows students to gain hands on experience in laboratories, which if halted affects the quality of education. This study reports that students in the field of Engineering and Related Technology and Information Technology were hardest hit by the cancellation of practical classes. This also resulted in higher dissatisfaction of students. According to WHO, COVID-19 will stay for a long period and, therefore, it is important to develop a long-lasting solution where blended learning is introduced to overcome the challenges faced in experiential learning. This study suggests to introduce a mix of online and in-person classes to address the challenges that appeared during the initial experience such as, cancellation or postponement of lab classes, or completely shifting lab classes to online environment without practical element. The private HEIs and government together should develop national exit strategies to promote recovery and ensure higher quality of education. Academic institutions can conduct practical classes at reduced capacity and can also schedule all classes in such a way to limit the presence of students at campus at one time. Moreover, results show that almost half of the total 145 research students are facing problem in completing their projects on time, many are modifying their proposals and worry that current situation has minimized their learning opportunities; the above stated measure will also allow research students to access labs so as to continue and complete their projects on time.

On top of the learning loss, COVID-19 pandemic brought financial implications for many. The economic impact on households have caused problems for several students to pay their fees. Polikoff et al. (2020) also reported that Hispanic and low-income groups were affected the most financially, which consequently affected their decision to re-enroll. This analysis shows that only few academic institutions are introducing flexibility ways (fees reduction, more installments etc.) to pay fees. Considering the large proportion of students facing financial problems, it is advisable to all institutions to at least provide some sort of relief to students in the form of flexibility to pay such as allowing to pay in several installments, delaying the fee payment deadlines, or in some cases allowing to register for courses without receiving minimum required payment.

## **Conclusion**

This research has outlined several impacts of COVID-19 pandemic on private HEIs in Oman. The results show that existing infrastructure at private HEIs in Oman and the culture of using technology in curriculum has helped institutions to adopt different sorts of remote teaching methods collectively. Hence, most of the students possess necessary technological tools to cope with remote teaching and learning. However, disruption of institutional activities cannot be completely avoided, which had a negative impact on the quality of education. This is indicated by the cancellation of lab classes and lab exams in most cases, constraints in completing research projects and coursework, and unbalanced workload. All these factors resulted in the dissatisfaction of more than half of the respondents. Therefore, in future, academic institutions and government should collectively work on introducing a mix of online and in-person classes to address the challenges that appeared during the initial experience such as, cancellation or postponement of lab classes, or completely shifting lab classes to online environment without practical element. Moreover, COVID-19 brought economic challenges for many household, which is consequently affecting students in terms of fees payment. Some institutions have introduced measures to help students with regard to fees payment, however the study suggest that flexible ways of fee payment should be adopted on wider scale.

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The Author(s) declare(s) that there is no conflict of interest.

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