Research Article

A comparative study for mental health challenges of students: Online versus on-campus education

Sara Suleymanova [1]
 0000-0003-3329-0676

Amjad Gawanmeh [1*]
 0000-0002-3897-0681

Suhair Al-Alami [2]
 0000-0003-1488-4305

[1] University of Dubai, Dubai, UAE
[2] Skyline University College, Sharjah, UAE
* Corresponding author: amjad.gawanmeh@ieee.org

ARTICLE INFO	ABSTRACT
	The COVID-19 pandemic has changed the way instructors teach and students learn. Rather than receiving education face-to-face on-campus, remote online education emerged as an alternative solution. If implemented properly though, online education can have its positive impact on the teaching and learning processes. Online education, however, may have its deficiencies, especially in terms of mental health. This paper is a follow-on study comparing students' perceptions towards remote online education versus their perceptions towards on-campus education as regards mental health specifically. Involving sixty-two engineering students at a private university in Dubai, where this study was implemented, the researchers utilized a questionnaire focusing on both online and on campus education models, which was conducted during the COVID-19 lockdown time and on-campus education following the lockdown period. Based on the study's findings, most respondents were in favor of on-campus education, particularly in relation to its impact on student mental health. **Keywords:** COVID-19, online education, mental health, education models, on-campus education, graduate education

INTRODUCTION

The COVID-19 pandemic caused some issues for both learners and instructors. For example, educational institutions all over the world had to close, shifting from the on-campus to the online mode of education. This shift is believed to have resulted in some issues amongst the most prominent of which was mental health, specifically in relation to students. Obviously, mental health is considered amongst the most crucial factors to consider whilst teaching as it may negatively impact students' academic achievement (Al-Karaki et al., 2021; Suleymanova et al., 2022).

As mentioned above, the shift from face-to-face to online delivery of courses due to COVID-19 has resulted in several challenges, some of which are related to quality of technological facilities, some to quality of instructors' IT training, some to quality of students' IT skills, and some to quality of mental health conditions. While technological facilities, instructors' training and students' skills have been discussed by different scholars, not enough studies have been conducted to delineate students' mental health conditions as caused by remote online education. Logically speaking, mental health has a significant role to play as far as quality education is concerned. A student who is depressed or who cannot engage affectively and actively in the teaching-learning process may not be ready to achieve high grades and maximize his/her potential.

Inspired by the need to address mental health related issues when education is delivered online versus when on-campus, this paper is a follow-on study seeking to highlight students' perceptions towards mental health related issues during remote online education and face-to-face on campus education. As such, this study is intended to compare higher education students' mental health when university courses were offered remotely online and their mental health when university courses were offered after they were back on-campus. Based on the study's findings, it could be possible to have a clear idea about how online education impacts students' mental health, and accordingly, what could be done to address problematic issues.

The literature review below sheds light on several points, which pertain to the topic this paper deals with. The paper then proceeds to discuss the tool used for gathering sufficient data along with the study's findings. Finally, the paper concludes with recommendations for educationalists to consider when requested to teach remotely online.

RELATED WORK

Due to the COVID-19 pandemic, educational institutions all over the world had to adopt remote online education, and higher education institutions in the United Arab Emirates were no exception. This part of the paper portrays several issues regarding online education such as its advantages and drawbacks.

To start with, what is meant by online education? According to several scholars, online education is a form of teaching and learning, which is not new within higher education institutions (Suleymanova et al., 2022). Online education covers educational contexts in which asynchronous and synchronous means of communication are involved to facilitate student learning apart from where students are (Littlefield, 2018; Singh & Thurman, 2019). Online education refers to contexts, where instructors and students are involved in the teaching and learning processes whilst being in different places (Alfred & Sigrum, 2001; Hiltz & Turnoff, 2005).

Online education has several advantages (Hysaj & Suleymanova, 2021). It can be seen as a tool, which would allow for more flexible as well as cheaper learning, especially when taking into consideration the expenses of transportation and the like (Dhawan, 2020). Moreover, online education accelerates learners' pace of learning since they can schedule course timings as per their convenience (Saxena, 2020), not to mention that online education leads to a green environment in which paper consumption is avoided by students, instructors, and managers.

Although technological advancements have enabled us to experience a more convenient educational life than past generations, they have not necessarily ensured any better mental health conditions for today's generation of learners. Concerned particularly with remote online education's effects on students, Celik et al. (2022) observes that psychological effects of remote online education on learners have not been positive. Liguori and Winkler (2020) are of the opinion that physical distance is a major issue the outcome of which might not be promising enough.

On the other hand, Carey (2020) states that the main challenge, which educational institutions encounter whilst teaching online is being able to utilize technological facilities as required. Due to lack of IT training or facilities, being able to utilize technological tools as desired may not be possible. Another challenge to encounter within the contexts of remote online learning is that of online assessment. Several scholars such as Baleni (2015) and Fontaine (2012) amongst others argue that online assessment whether summative or formative may entail lack of reliability. For instance, online assessment contexts could allow for more cheating opportunities as students might still be able to cheat in the absence of invigilators.

Linguistic barriers during remote online classes, as Hysaj and Suleymanova (2020) explain, could be felt in language classes, where students might not always be provided with authentic communication situations for them to enhance their communicative competence and promote their language skills. Unlike on-campus classes, where students interact face-to-face while working physically in pairs or groups, remote online classes may somehow lack the pleasure of communicating face-to-face with peers and instructors alike.

The remaining parts of the literature review reflect on three research studies, which took place within online educational contexts. Aiming to explore the effect of remote online education, Chisadza et al. (2021) conducted a study investigating the factors that would affect student performance after transitioning from

face-to-face on-campus to remote online education, which was imposed by the circumstances relating to COVID-19. The study's findings prove that students' achievement was positively associated with provision of good Wi-Fi access. Based on the study's results, Chisadza et al. (2021) suggest that upgrading digital infrastructure and decreasing the cost of internet access would be required for mitigating the influence of the COVID-19 pandemic on learning outcomes.

Janmaimool and Nunsunanon (2021) implemented a study the aim of which was to examine the differences of learning effectiveness between face-to-face and remote online lectures and identify the factors, which would yield effective online instruction. The factors, which Janmaimool and Nunsunanon (2021) included were interaction between students and instructors, interaction among students, online platform quality, and students' skills in utilizing technological tools. The study involved two hundred and sixty-one students at King Mongkut's University of Technology in Bangkok. A questionnaire was designed and distributed to both compare the effectiveness of online and face-to-face instruction and identify the factors that played a role in terms of empowering online instruction. The statistical results indicate that online classes were less effective than face-to-face ones. The factors, which significantly impacted the quality of online instruction, as seen by the participants, were lack of opportunities to interact with instructors and classmates, type of online platforms, and distractions in the students' environment while attending online classes.

Using a descriptive study to investigate students' perception of online versus traditional instructional contexts, Harris et al. (2014) created a survey and distributed it to ten students who were enrolled in postgraduate educational leadership courses during the fall semester of the year 2012. The findings show that due to convenience, smoothness of use and time flexibility, the participating students expressed their high satisfaction with online courses as opposed to face-to-face ones.

In conclusion, technological advancements have paved the way for remote online education to be conducted smoothly, thus enabling higher education institutions to cope with today's digital needs (Jukes & Schaaf, 2018). However, remote online education has several drawbacks, which should be identified and targeted for better educational outcomes.

RESEARCH OBJECTIVES/QUESTIONS

This study aims to examine the effect of the transition from online learning going back to on campus mode of education on mental and readiness of students in Engineering College at University of Dubai, UAE. Furthermore, it addresses the impact of their return on their performance and discusses the challenges encountered by the transition post-COVID-19.

The study focuses on students' perspectives to find solid answers for several key research questions/objectives, as listed below:

1. Did students encounter mental challenges by transferring from online education back on campus post-COVID-19 crisis?
2. How did students mentally deal with assessments when transferred from online education back on campus post-COVID-19 crisis?
3. Were students able to mentally adapt when they were back on campus?
4. To examine how the student engagement was affected by the transition from online back on campus post-COVID-19.

MATERIALS AND RESEARCH METHODOLOGY

In this section, we describe the research methodology including research design, tools, and administration details of the study. The study adopted both quantitative and qualitative instruments to analyze the mental challenges of students after going back on campus post-COVID-19. The study is limited to engineering students at University of Dubai. The research used the systematic survey that was designed using the quantitative research approach. The questionnaire was given to students in different sections and levels across the college. Then, responses were collected over two phases. The first phase was conducted while students were doing online education. The data was collected over a period of two weeks. Then, results were

collected and analyzed and published in a conference presentation (Suleymanova et al., 2022). After students came back on campus, the questionnaire survey was redesigned by changing the questions context to measure their responses to similar questions while on campus, and to study the mental health for students after they were back on campus and did the first semester. Similarly, the data was collected over the period of two weeks.

The scale used to measure the descriptive survey was adopted from (Wang et al., 2020), where answers could range between, yes, no, and maybe.

Research Design

This survey was designed based on the perspective of students while studying online, and then their perspective after they were back on campus. A detailed questionnaire was designed and adopted in the study as a tool to measure the mental health of students during the transition from online to on-campus.

Data collection method

The study was given to students online, using the Moodle platform and zoom, and then, students were given a period of time to respond to the questionnaire. Data was collected online anonymously. The research received the approval of the university. In addition, the participants in the study were briefed about the purpose of the survey at the beginning and related consent. Responses were collected over a period of two weeks in each phase.

Population and Sample

The study targeted engineering students at University of Dubai from all levels. Students were targeted in different classes at different levels, to ensure that collected data from selected candidates is representative as a sample for the quantitative study using disproportional sampling. All the sample respondents provided full cooperation in responding to all parts of the questionnaire. Descriptive statistics were used for quantitative data analysis. Finally, the questionnaire and data collection method were passed in the ethical committee of the college.

Research Instrumentation

Reliability of instrument

Pearson product moment correlation, a common statistical analysis measure for linearity between data, was used for this purpose by providing the instrument into two groups that were not part of the study obtaining a ratio between 0.75 and 0.95, which showed that the instruments were highly reliable.

Administration of instrument

The instrument was administered through online Moodle education learning management system. Follow-up communications with students to ensure that they respond within the given time. This method was following university policy and regulations.

Method of data analysis

Data collected was analyzed and processed using the statistical instruments MS Excel. The questionnaire was designed to be answered using descriptive statistics with an extra hypothesis that was evaluated using the adopted method. Given the type of questions, and nature of the responses embedded in the survey, we believe that advanced statistical methods were not necessary to draw conclusions based on the collected data. Hence, MS Excel was sufficient to do the analysis.

FINDINGS

In this section, we present the findings of the study. All the collected online survey data responses were considered in the analysis.

As **Table 1** demonstrates, 32% of the subjects felt they were effectively coping with important changes imposed by online learning, and 73% felt they were effectively coping with important changes related to being

Table 1. Subjects' responses to the questionnaires' items 1-7 in percentages (%)

No	Question	Yes
1	Have you felt that you were effectively coping with important changes in online learning?	32.0
	Have you felt that you were effectively coping with important changes back on campus?	*73.0*
2	Are you able to catch up with online deadlines (for projects/assignments, etc.)?	56.0
	Are you able to catch up with deadlines back on campus (for projects/assignments, etc.)?	*63.0*
3	Was it easy for you to transition from physical classes to online classes?	32.0
	Is it easy for you to transition from online classes to physical classes?	*82.5*
4	Do you think that online classes enhanced your teamwork?	36.0
	Do you think that being back on campus for classes and labs enhanced your teamwork?	*60.0*
5	Did you benefit from online labs?	52.0
	Do you benefit from labs being on campus as opposed to online?	*87.0*
6	Do you think online assignments were increased or more difficult during online education?	52.0
	Do you think assignments are increased or more difficult after being back on campus?	*19.0*
7	Do you think online assessments caused more stress & troubles as compared to regular class assessments?	52.0
	Do you think that assessments on campus caused more stress & troubles as compared to online class assessments?	*73.0*

back on campus. Obviously, there is a significant difference between subjects' responses to the first question of the questionnaires on mental challenges faced during online learning and those faced after being back on campus, in favor of on-campus learning. In relation to being able to meet online deadlines as opposed to being able to meet deadlines after being back on campus, 56% of the responses indicated being able to meet online deadlines and 63% indicated being able to meet deadlines after being back on campus. Though not significant, there is still a difference between subjects' being able to meet online deadlines and subjects' being able to meet on-campus deadlines, in favor of the latter. Proceeding to the third question, which examines easiness of transition from physical to online classes and from online to physical classes, the gathered data reveal a significant difference between the two situations in favor of the transition from online to physical classes; 32% of the subjects' responses opted for easiness of transition from physical to online classes and 82.5% for transition from online to physical classes.

Concerned with enhancing teamwork skills via means of classes online as opposed to classes on campus, 36% of the respondents thought that online classes could foster their teamwork skills and 60% thought that physical classes could. Based on these percentages, we can conclude that physical classes have a much more profound effect on promoting teamwork skills when compared to the effect online classes have. Relating the discussion to the amount of benefit subjects had through virtual labs as opposed to physical ones, 52% of the responses confirmed the benefit of virtual labs and 87% the benefit of physical labs. Therefore, this finding proves that physical labs are more beneficial than online ones, which could be due to the practical nature of lab work amongst other factors.

When requested to reflect on the difficulty level of online and on-campus assignments, the current findings indicate that online assignments were more difficult to handle (52%) than on-campus assignments (19%) were. This could be justified by the exposure duration to online assignments as opposed to the physical assignments' exposure duration, which the respondents had throughout the course of their school and university studies. Concerned with the amount of stress and trouble caused by online versus on-campus assignments, the study's results reveal that 52% of the respondents found online assignments to have caused more stress. By contrast, 73% of the respondents found on-campus assignments to have caused more stress. Surprisingly, this finding is not in line with the other findings of this study.

Table 2 illustrates subjects' agreement responses to the eighth, ninth, and tenth items of the questionnaire on mental challenges students encountered during remote learning, alongside their agreement responses to the eighth, ninth, and tenth items of the questionnaire on mental challenges students encountered after being back on campus.

Highlighting the degree of annoyance students had while performing online activities, 66% of the respondents found turning on the camera and mic to be the most annoying, followed by internet connection issues (54%), doing exercises (20%), and answering questions (18%) (**Table 2**). On the other hand, performing activities on-campus was generally felt to be of less annoyance.

As per **Table 3**, around 28.5% of the respondents expressed that being in the class with other classmates while performing activities was the most annoying factor, followed by 24% in relation to doing exercises, and

Table 2. Subjects' responses to the questionnaires' items 8-10 in percentages (%) while online

No	Question		%
8	Were you annoyed by any of the activities done during online classes?	Turning the camera or mic on	66.0
		Internet connections	54.0
		Doing exercises online	20.0
		Answering questions in class	18.0
9	Did you feel confident about your ability to handle online?	Assignments	60.0
		Exams	42.0
		Projects	48.0
		Classes	36.0
		None	24.0
10	Were there any distractions at your location during your online courses?	Social media	24.0
		Internet	44.0
		Video games	80.0
		People around	48.0
		Others	42.0

Table 3. Subjects' responses to the questionnaires' items 8-10 in percentages (%) right after back on-campus

No	Question		%
8	Are you annoyed by any of the activities performed while on campus as opposed to online?	Being in the class with other colleagues	28.5
		Feeling uncomfortable in the class	9.5
		Doing exercises in the class	24.0
		Answering questions in class	22.0
		None	60.0
9	Did you feel confident about your ability to handle while being on campus?	Assignments	25.0
		Exams	65.0
		Projects	35.0
		Classes	48.0
		None	24.0
10	Do you think being back on campus eliminated any of these distractions?	Social media	44.0
		Internet	25.0
		Video games	41.0
		People around	17.0
		Others	28.5

22% in relation to answering questions. Approximately, 60% of the respondents expressed not being annoyed while performing activities on-campus. As the current results indicate though, both doing exercises and answering questions during online classes were less annoying than when on-campus. The differences, however, cannot be considered significant.

Finally, the distraction factor was also examined with reference to both online and on-campus classes. The results confirm that during online courses, video games were a highly distracting factor (80%), followed by the people around (48%), the internet (44%), and social media (24%) (refer to **Table 2**). Other distractions during online courses were unspecified, reaching 42%. During on-campus classes, however, the sources of distraction were not highly eliminated. The distraction caused by social media was the highest (44%), followed by video games (41%), the internet (25%), and the people around (17%) (**Table 3**). Around 28.5% of the subjects confirmed the absence of any other distracting factors. In general, it can be stated that the distracting factors were higher in intensity during online education than during on-campus education settings.

As far as the confidence factor is concerned, 60% of the subjects were confident about their ability to handle online assignments, 48% to handle online projects, 42% to handle online exams, and 36% to handle online class issues. Around 24% had no lack of confidence in relation to dealing with online education. On the other hand, 65% of the subjects were confident about their ability to handle on-campus exams, 48% about their ability to handle on-campus classes, 35% about their ability to handle on-campus projects, and 25% about their ability to handle on-campus assignments. Around 24% of the respondents had no lack of confidence regarding how to handle on-campus education issues. Commenting on the amount of confidence students had when online as opposed to when in on-campus classes, it can be realized that there are no significant differences between these two modes of education as per the findings of this study.
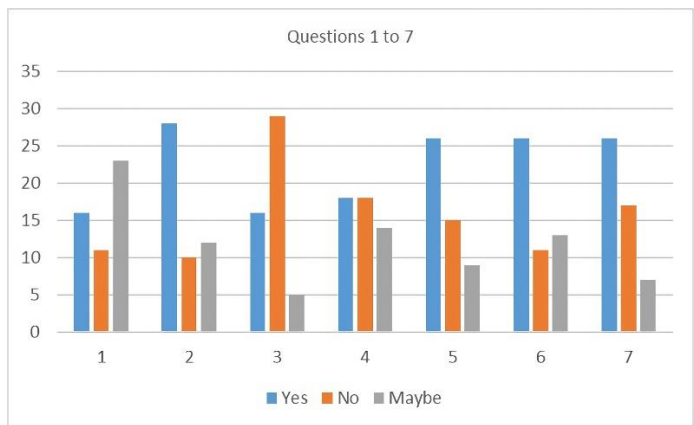
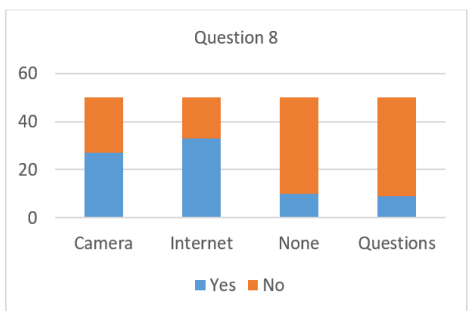**Figure 1.** Quantitative analysis of answers for questions 1 through 7 online (Source: Authors)

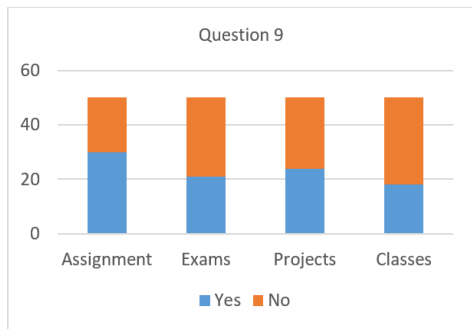**Figure 2.** Quantitative analysis of answers for question 8 online (Source: Authors)

Figure 3. Quantitative analysis of answers for question 9 online (Source: Authors)
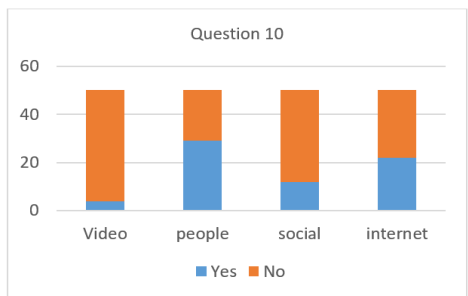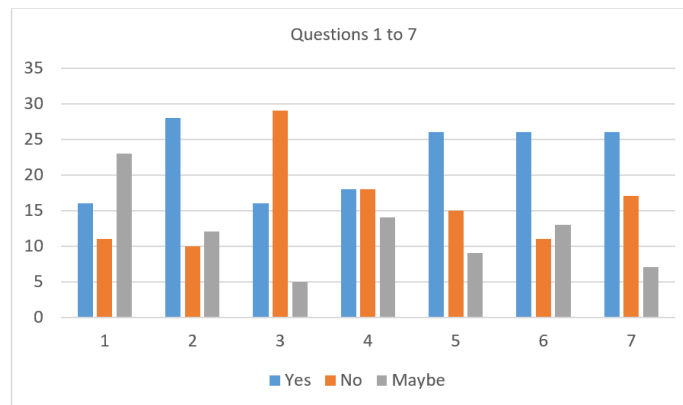

Figure 4. Quantitative analysis of answers for question 10 online (Source: Authors)

We also showed quantitative analyses of answers for questions both online and on campus. **Figure 1** shows quantitative analysis of answers for questions 1 through 7 online.

Figure 2 shows quantitative analysis of answers for question 8 online.

Figure 3 shows quantitative analysis of answers for question 9 online.

Figure 4 shows quantitative analysis of answers for question 10 online.

Figure 5. Quantitative analysis of answers for questions 1 through 7 on campus (Source: Authors)
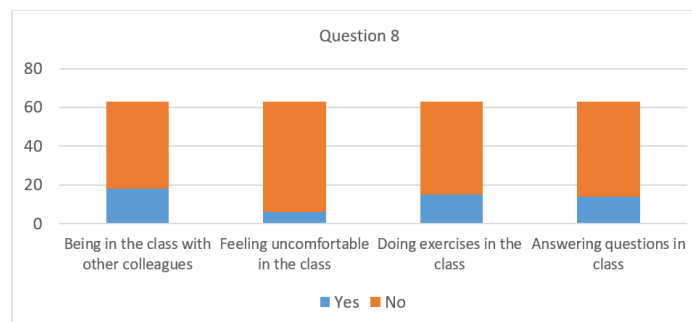

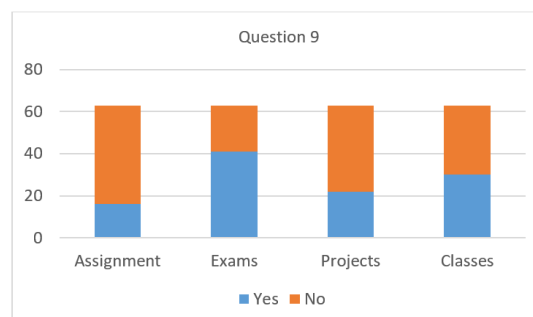**Figure 6.** Quantitative analysis of answers for question 8 on campus (Source: Authors)

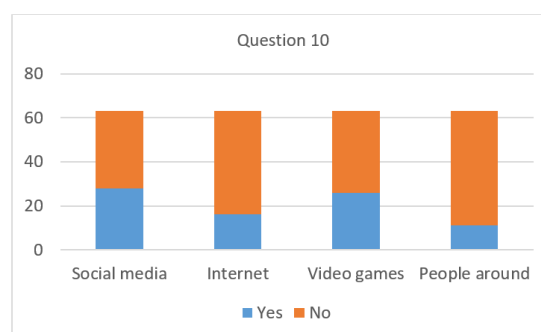**Figure 7.** Quantitative analysis of answers for question 9 on campus (Source: Authors)

Figure 8. Quantitative analysis of answers for question 10 on campus (Source: Authors)

Figure 5 shows quantitative analysis of answers for questions 1 through 7 on campus.

Figure 6 shows quantitative analysis of answers for question 8 on campus.

Figure 7 shows quantitative analysis of answers for question 9 on campus.

Figure 8 shows quantitative analysis of answers for questions 10 on campus.

DISCUSSION AND RECOMMENDATIONS

Discussion of Results

As shown by the study's findings, students were not highly ready for remote online education. Accordingly, the shift has somehow impacted students' mental health negatively. However, remote online education may in some ways be the future of teaching and learning. This requires that mental health, technology quality, and proper IT training amongst other related issues be emphasized (Favale et al., 2020; Parkes et al., 2014).

Recommendations

To maximize the effectiveness of conducting lectures remotely online, efforts should be geared towards enhancing IT competencies and skills on the part of instructors and learners to be able to effectively cope with the requirements of digital education. Al-Alami (2021) proposes six points to consider while teaching remotely online. These are strategy choice, ongoing assessment, rigorous evaluation, attention-grabbing, performance-eliciting, and empathy.

Strategy choice requires selecting optimal pedagogical strategies for teaching remote classes online. Depending on the objectives of the lesson, the course learning outcomes, and the program learning targets, instructors need to select what would best suit their students. Ongoing assessment necessitates conducting formative assessments on a regular basis, whilst selecting the best options to use for online assessment platforms. Rigorous evaluation would enable us to identify the most transparent online means for judging students' performance effectively, whilst maintaining the criteria of evaluation validity, integrity, reliability, credibility, and objectivity. Attention-grabbing refers to selecting a repertoire of relevant methods to capture and maintain students' attention during remote online contexts, as it would be possible for students to lose interest in the absence of instructors' face-to-face presence and lack of engaging activities. Performance-eliciting requires relevant instructional practices to elicit students' responses during remote online classes. Finally, empathy is a value, which instructors should acquire to perceive and respect the way their students think and feel. As discussed earlier, teaching remotely online imposes several challenges, one of which is mental health. An essential ingredient of a teaching effectiveness recipe is that of addressing students' emotional needs. Therefore, instructors need to show empathy throughout their online teaching journey.

To minimize obstacles whilst teaching remotely online, Martin (2020) emphasizes ensuring students' mental wellbeing, devising stimulating educational activities, and maintaining healthy relationships between students and instructors. According to Kebritchi et al. (2017), employing appropriate pedagogical approaches, designing engaging instructional content, and involving students actively in the teaching-learning process are expected to decrease barriers to effective instruction online.

Study Limitations

One of the limitations of the study, as we believe, is the short period of time between being back on campus and the conduction of the study. Students may need more time to adapt to the on-campus mode of education after being online for around two years. Another important factor is the number of students who participated, which is around 62 students. This is due to the fact that we are a small university with a small number of students. Finally, we believe that the questionnaire was simplified in order to make it more convenient for students to respond. Despite all of these limitations, we still believe that the study was necessary and informative, in particular in this environment, where these types of studies are very limited, if not absent at all. In order to address these limitations, we intend to conduct more analysis, and design more advanced questionnaires, and also conduct it on a wider scale, including students from different disciplines and different universities in the area.

CONCLUSIONS

To conclude, the current era necessitates utilizing technological advancements whilst teaching so that students will be able to cope with the ever-changing requirements of today's digital world. Even though remote online education has its merits, the face-to-face human interaction, and the positive consequences it

entails will be missing. Moreover, remote online education has been proved to have impacted students' mental health, as proved by this study amongst others.

As previously mentioned, this paper is a follow-on study dealing with the impact remote online education could have on students' mental health. The study, however, is limited to one private university in Dubai, one college within the same university, and a sample of 50 students for the remote online education and sixty-two for the face-to-face education after the students were back on-campus to receive their university courses. The authors of this paper, therefore, recommend conducting more studies to further examine the issues this paper examines, and to involve more institutions, colleges, and students to better ensure reliability and credibility. Additionally, the authors recommend including instructors in future research projects when examining the same or similar issues as instructors' roles and opinions matter.

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