

## Changes in the education landscape caused by COVID-19: Opportunities and challenges from UAE perspective

**Asma Khaleel Abdallah**<sup>a\*</sup>, United Arab Emirates University, Department of Education, St.4. Building 19B, Al-Ain, United Arab Emirates <https://orcid.org/0000-0002-8009-5702>

**Rashid Alriyami**<sup>b</sup>, United Arab Emirates University, Department of Foundation of Education, UAE University College of Education H1 Office 2010; Al Ain, UAE <https://orcid.org/0000-0002-1697-2360>

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### Abstract

The study aim is to identify the opportunities for the United Arab Emirates (UAE) educational sector during COVID-19. A survey was conducted among a sample of 100 teachers from 20 UAE higher education institutions. Teachers use online learning tools that cannot fully provide the benefits of face-to-face meetings with students. The research methodology is based on primary and secondary data analysis. Teacher questionnaire was formed; it contains 9 questions on distance learning actualization in a pandemic. Only 25% of those surveyed agreed with the inclusiveness and ease of remote learning technologies use, 20% expected that after a lockdown, learning could return to the status quo; 55% disagreed that the technologies used stimulate creativity and have an evidence base. Among key findings are that almost all respondents (95%) see the necessary reform of distance education for its further adaptation in the post-COVID-19 period. The study shows a significant imperfection of the applied online learning technologies. Studies from around the world have shown that school shutdowns have had similar consequences for most education systems.

Keywords: COVID-19; education; online learning; pandemic outbreak; teaching and learning.

\* ADDRESS FOR CORRESPONDENCE: Asma Khaleel Abdallah, Department of Education, United Arab Emirates University, St.4. Building 19B, Al-Ain, United Arab Emirates  
E-mail address: [abdallahasmakh7@yahoo.com](mailto:abdallahasmakh7@yahoo.com) / Tel.: 00971503611464

## 1. Introduction

The life and study at schools and colleges are being influenced in myriad ways, of which some effects are yet to be comprehended (Sweeney, 2020). The recent pandemic that has ravaged the world will most certainly cause grave disruptions to the educational scenario. However, the most immediate and evident impact is the interruption by required physical distancing measures.

Schools are actively searching for other methods of learning during the period of social distancing (Basilaia & Kvavadze, 2020). However, not all schools have been able to adopt online teaching methodologies. Besides, a major concern is that these modalities are likely to work better for children who have well-educated parents, greater social advantages and access to the needed resources. For students lacking such resources, the period of social distancing may culminate into reduced opportunities to learn (Kissinger, 2020).

The pandemic has put forth a multitude of challenges as well as opportunities for the world of education. However, it is hoped that for the Generation Z and the future generations, such experiences of remote learning and physical distancing will serve as a careful reminder of how important the need for social interaction is. This study aims to identify the opportunities and challenges in the UAE educational sector brought by COVID-19, for both students and teachers. To fulfill this aim, the following aspects were considered:

- i. Opportunities and challenges in the interconnected world;
- ii. Changes in the roles played by students and teachers;
- iii. A skill set that will become a requisite in post-COVID-19 times;
- iv. Response of UAE higher education institutions.

The rationale behind conducting this research revolves around how the COVID-19 pandemic is set to change everything around us sooner than expected, especially in the education sector. While online education has become the default mode of learning during the period of lockdown, it is important to understand what does this mean for the academic institutions, teachers and students in the long run. Little or no research has been conducted in relation to the impact of COVID-19 on the education system. The present research tries to fill this gap.

The present research is intended to have both pragmatic and academic benefits. Students, faculties and school administrations can get an understanding of the challenges and thus be better prepared to tackle them. Plus, they will also get a comprehension of how their roles will change in the post-COVID-19 world and adapt accordingly. Changes are the norm, and recognizing how they can impact lives helps with the readiness towards them. This is what this study intends to do. As far as academic benefits are concerned, this is a fairly new subject and a lot of other studies can be drawn from this research. Scholars will have a resource to fall back on when considering similar subject matters. Lastly, this paper intends to encourage other researchers to document and present research evidence on how the pandemic has transformed educational modalities across the globe.

### 1.1. Impact of coronavirus on school closures

The World Health Organization (WHO) declared the COVID-19 outbreak to be a pandemic on Mar 12, 2020. On Mar 18, 2020, the UN Educational, Scientific and Cultural Organization (UNESCO) estimated that around 107 nations had implemented school closures, impacting 862 million young people and kids. This is almost half the global student population (TUAC Secretariat Briefing, 2020). The situation had quickly aggravated and a UNESCO report showed that there were over

1,576,021,818 affected learners in 188 nations at all levels of learning (TUAC Secretariat Briefing, 2020).

### *1.2. Previous pandemics and their impact on education*

Several educational reformers have long held the hope that computers and related information and communication technologies (ICTs) can be integral to initiating much-needed transformations in educational systems. Though not undermining the potentially revolutionizing effect of ICTs usage to help satisfy a range of learning objectives, history has demonstrated that introducing positive change is not accomplished by simply providing schools with a deluge of computers and ICTs (Menino, 2020).

In 2009, a severe swine flu outbreak struck Mexico. Schools were closed and it became unclear how to instantly satisfy the learning requirements of nearly seven million pupils. Due to the flu, Mexican schools underwent quick, disruptive transition of a different kind. Some policymakers began asking: how is technology relevant in such cases? Given a status quo, they realized that the usage of ICTs was perhaps not sufficient to kick-start a systematic change. However, how may ICTs be helpful, even revolutionizing, when the status quo is disturbed by a factor like a pandemic outbreak? Nonetheless, it was too soon to get an answer from the Mexico crisis to such a question (Ryabikina et al., 2022).

There were similar school and college closures when there was an outbreak of SARS in China in 2003. When the scale of the epidemic became pervasive, China Educational TV, through its "Classroom on the Air" program, quickly acted to help mend some of the gap (Marek et al., 2021). Though, possibly not transformational, the initiative did offer a wide-ranging, short-term replacement for students wanting to continue their education while being at home. For instance, in Hong Kong, 1,302 schools were closed, 1,000,000 students stayed at home. Instances of more evolutionary uses of ICTs took place in Hong Kong, where access to the internet and computers at home was more extensive as compared to the rest of China. However, even in cases of successful implementation of ICTs in education, some teachers noticed that the dependence of pedagogy on ICTs was frustrating and that they were even less convinced of ICTs' value for the learning process than they were before. A variety of studies have demonstrated that remote learning environments can be used successfully in schools and colleges that have suitable technical support and environment (Dhawan, 2020).

### *1.3. Opportunities*

Over the last two decades, the crossover to e-learning was taking place in bits and parts, across different levels: universities, colleges, skill development programs, corporate learning centers. However, with nearly 60 million students globally confined to their homes, institutions and learners are under pressure to not miss out on academic time and to reinvent their teaching-learning process and go completely online. The completely technology-mediated learning has been termed by many as Education 4.0. The first three waves of educational methods evolved throughout 2000 years: the *Gurukula* system (one teacher to a few students), the conventional university system (one teacher to many students) and distance learning (one teacher to many students via the Internet) (Basilaiia & Kvavadze, 2020; Schneider & Council, 2021).

According to Ramachandran and Gopinathan (2020), there is an opportunity for higher education institutions to integrate health and environmental courses in their curriculum. Besides, it is critical to make school curriculum responsive to the needs of the present times. Such basic health and environmental courses must be accessible to all students and not only to those majoring in science-related fields. Teachers have the opportunity to aggregate various pedagogical models, instead of relying on just one. They can combine learning psychology, content delivery, behavioral assessment to

gauge students' progress. Faculty members will also have the chance to massively retrain and orient themselves for e-learning teaching process. By opting for a learner-centric delivery model, they could induce changes in mental models of learners by fostering their conceptual understanding (Shahabadi & Uplane, 2015).

At the same time, the practical application of distance learning during a pandemic is an incentive for its deep assessment, analysis of advantages and disadvantages. The study of Russian scientists demonstrates a clear difference between attitudes towards online learning of students and schoolchildren. The majority of students praised distance learning and intend to continue to learn online in the future. On the other hand, schoolchildren noted much more deficiencies in online education and expressed a desire to return to the full-time teaching form (Belousova et al., 2022).

#### *1.4. Impact on students' learning outcomes*

A study by Niranjan (2020) shows that school closures negatively impact students' learning outcomes. The disadvantages are more for underprivileged students who do not have much learning opportunities beyond school. Drop-out rates of students start increasing and not everyone may return to school after closures. This holds true for long closures. Homeless, at-risk and disadvantaged students are more likely to not go back after closures (Kissinger, 2020). The effect of this often culminates into a protracted disadvantage from missed out opportunities.

During a pandemic, students may spend several months at home without personal support of teachers. Several young people may have gone through stress and poverty. They may have seen family members become sick or even worse. Their outdoor activities become restricted. Rates of domestic abuse have been increasing during the lockdown. Several children are likely to display signs of post-traumatic stress. Many children may have spent hours playing video games or looking at screens (Buheji & Ahmed, 2020; Qazi et al., 2021). Thus, schools will need additional resources. Counsellors, learning support teachers and mental health specialists will have to be engaged to help vulnerable and weak learners to settle down.

#### *1.5. Post-coronavirus teaching and learning*

Many are worried that the abrupt transition to e-learning will damage the reputation of online education. However, Gillett-Swan (2017) believes that the pandemic-led shift to universal remote learning is not all that bad for student learning. The primary future benefit of such learning will manifest after the professors and students return to classrooms. The need to learn and teach through asynchronous and synchronous platforms will produce major benefits when such techniques are layered into face-to-face instruction. Toquero (2020) believes that everyone will come back from the pandemic with a greater mutual understanding that digital tools are not substitutes but complements for face-to-face learning.

Several schools and colleges were already practicing online education prior to the coronavirus outbreak. However, there was great disagreement about the importance of this type of training for the strategic planning of an institution. This is set to change after the pandemic ends (Sanz et al., 2020). In the times to come all deans, presidents and trustees will know that e-learning is not just a possible source of revenue but is core to every institution's plan for academic continuity and resilience.

The infrastructure of a school/college will not have much impact on the education quality and hence directly on the cost of education. Parent-teacher associations (PTAs), review meetings and subject conferences will all be location independent (Sweeney, 2020). It is likely that in the post

COVID-19 times, students may be permitted to undertake courses from any university, regardless of their location and will get a degree without leaving home. This will result in a balance of economics and quality education. However, for this to manifest, a radical transition in thought process of policy makers, students, and teachers is required (Donthu & Gustafsson, 2020; Sweeney, 2020).

COVID-19 has exposed the vulnerability of the entire economy to the need to supply basic necessities. Consequently, countries are planning to bring some of the main industries back home. Thus, there will be a need for appropriate incentives for vocational training (Menino, 2020). Teachers will emerge as the unsung heroes of the pandemic. They have been preparing resources for online education, delivering school supplies, connecting with students and their parents to ensure they are doing well.

### *1.6. Gap in existing literature*

It is well understood that the COVID-19 is a recent phenomenon and not many research works have been conducted in the domain of education. Still, a lot of relevant information is available. Nonetheless, there are many opportunities for a deeper study of topics like the changing roles of students and teachers in post-pandemic setting, the opportunities and challenges faced by the education sector in the UAE context, and the skill sets that will become a requisite in the times to come. The present study has been undertaken to gain a better comprehension of the aforementioned aspects.

## **2. Materials and methods**

### *2.1. Research design*

This research aims to identify the opportunities and challenges in the UAE educational sector after COVID-19 for both students and teachers. To perform this study, the research onion approach was adopted. This section puts into perspective the techniques and methods employed while conducting the study.

Research philosophy refers to the belief regarding the manner in which relevant data for a research should be collected, analyzed and used. There are two main types of research philosophies, namely, positivism and interpretivism. Positivism is the belief that only factual information that is obtained through observations, including measurement, is reliable. Interpretivism, on the other hand, entails a human interest in the research and involves researchers to interpret the research elements (Kothari, 2017). In the present case, positivism has been employed because the current study is quantitative in nature, i.e., it involves quantifiable observations that lead to statistical analysis. Data were collected and interpreted in an objective way. First-hand data were gathered, instead of relying on already existing data. Primary research has been performed primarily for addressing a particular research problem. Secondary research has been conducted to use the collected information to form a knowledge base and to derive conclusions (Peffer et al., 2007).

Quantitative surveys, case studies and qualitative interviews are some crucial research strategies that help performing a study in a proper manner. Research strategy is adopted on the basis of the study design. The current paper has employed descriptive research design, which is ideal to use when not much is known about the problem or topic. Besides, a quantitative research method is apt for the current study that aims to collect quantifiable data for statistical analysis (Mackey & Gass, 2015).

## 2.2. Participants

For the current research, non-probability sampling has been adopted. Convenience sampling technique (a type of non-probability sampling) was employed wherein the sample was obtained from a group of people who were easy to contact (Marczyk & DeMatteo, 2005). Given the ongoing lockdown, it was difficult to go out in the field and select samples. Hence, it was easier, time-saving and cost-effective to reach to people who were in contact. Using this technique, a sample of 100 people was collected, of whom all were teachers in 20 UAE higher educational institutions.

## 2.3. Data collection and Data analysis

Both primary and secondary sources of data were used to collect relevant information. While primary data helped gain first-hand information that was completely specific to this study, secondary data helped in forming a knowledge base and identifying a gap (Davidavičienė, 2018). It was this gap that helped in developing aims and objectives for the present study. Primary data were collected through a questionnaire survey. Secondary data were gathered from different sources (books, journals and news articles). The data were collected using a questionnaire, which respondents answered online, as well as in writing. The questionnaire is presented in the Appendix A for this study. The collected data have been analyzed in a quantitative way. Graphs and charts were created to examine the raw data.

The online survey was based on a list of questions (9 in total) developed by the authors (Appendix A). The questions included a choice of answers that would most characterize the thesis posed from the point of view of each respondent individually. The questions in the questionnaire were formed by analyzing the theoretical basis of related research, as well as taking into account the features of the UAE educational system and all the related shortcomings and risks. The questions concerned the assessment of distance learning quality, its effectiveness and interchangeability with the traditional education form, as well as each respondent's desire to reform online education.

The data were processed in SPSS Statistics 22.0.

## 2.4. Ethical considerations

All ethical aspects were considered while conducting the study. Prior permission was taken from the respondents and they were all informed about the nature and scope of the research. Respondents' personal information was not disclosed without their consent. Proper care of secrecy and confidentiality was taken.

## 3. Results

It has been identified that a large number of schools have been following fixed e-learning as a tool for online education (see Table 1). Fixed e-learning is a form where content used during the learning process does not change from its initial state and all students get the same information.

Table 1. How is learning managed during isolation?

E-learning tools	% of respondents
CML	20
SOL	20
Fixed e-learning	30
AOL	15
Interactive e-learning	15

In fixed e-learning the learning material is predetermined by teachers and is not adaptive to students' preferences. Such type of learning has been regular in traditional classrooms. However, it is not suitable for online educational environment. Synchronous online learning (SOL) and Computer Management Learning (CML) are the next common forms. SOL allows groups of students to engage in a learning activity at the same time from any part of the world. Real-time SOL entails videoconferencing and online chats. CML operates through information databases. Such information may include lecture information, training materials etc. Very few teachers engage in asynchronous online learning (AOL), which is the most student-centric e-learning tool and gives them more flexibility in terms of schedules and timeframes. Some teachers engage in interactive online learning which enables two-way communication between teachers and students and helps adapting teaching and learning methods.

Considering the state of e-learning tools used by UAE teachers, it can be said that the teaching and learning methods are somewhat outdated and not focused on students' needs. Out of the surveyed respondents, 50 have not agreed that the used technology is fair and inclusive (see Table 2). On the other hand, 28 found it to be unbiased and inclusive. This shows that the technology being used is not designed for a broad base of diverse students to use. Not all e-learning tools and delivery methods promote accessibility for users, are respectful of user's physical ability, language and socio-economic status. The fact that most teachers do not find the tools to be inclusive implies that not all students are able to access them at the right time and place. This indicates that students with disabilities and those who lack the resources are not getting the intended benefit of online education.

Table 2. Is the technology inclusive, fair and unbiased? \* SA = Strongly Agree; A = Agree; N = Neutral; D = Disagree; SD = Strongly Disagree.

	% of respondents
SA	2
A	28
N	10
D	50
SD	10

55 out of 100 respondents disagree that the tech employed encourages creativity and has a strong educational foundation (see Table 3). Only 25 teachers agreed to this statement. It may be implied that the agreement is for AOL and interactive e-learning methods. As stated above, fixed e-learning is similar to traditional classroom learning, which hardly moves away from the course material.

Table 3. Does the employed technology have a strong educational foundation and encourage creativity? \* SA = Strongly Agree; A = Agree; N = Neutral; D = Disagree; SD = Strongly Disagree.

	% of respondents
SA	5
A	20
N	20
D	35
SD	20

Nearly 50 respondents are not sure if they will/will not return to status quo once schools reopen. This shows that the lockdown has had a major impact on the mindset of teachers. They may or may not be supportive of the old-school ways of teaching and learning. In fact, 30 teachers are sure that they will not return to the traditional ways of classroom teaching once the lockdown ends. This indicates a paradigm shift in perspective. Teachers and education leaders at various governmental

levels recognize the severity of the pedagogical risks represented by the pandemic. The respondents who will not return to status quo are ready to take responsibility to lead a process that is equitable and effective in addressing this adaptive challenge. However, there are still 20 respondents who wish to return to the status quo. The challenges of e-learning process seem to have overwhelmed them.

Table 4. Will you return to the status quo when schools reopen?

	% of respondents
Yes	20
No	30
Maybe	50

The results presented in Table 4 show that the changes in education due to the epidemic breakdown can be irreversible. Only 20 surveyed people believe that learning will return to the status quo.

Table 5. Will the lockdown period work as a catalyst for education reforms that many have been seeking?

	% of respondents
Yes	35
No	25
Maybe	40

As presented on Table 5, almost 35 out of 100 respondents believe that the lockdown period will act as a catalyst for education reforms that many have been seeking. Such belief may have likely stemmed from the fact that the fallacies of educational institutions have become exposed because of the lockdown. Besides, everyone saw the drawbacks of outdated teaching methods firsthand. About 45 respondents are not sure if the pandemic will bring about a positive change. However, 25 respondents are sure that nothing will change once the pandemic is over.

Table 6. What changes can be expected?

	% of respondents
Permanent school place for disabled	20
No more toxic exam system	30
Up-to-date curriculum	40
A-level reforms	15
Importance of vocational education	35
Skill development	40

When asked about the changes/reforms expected, many hoped for a more up-to-date curriculum and for skill development to be an integral part of the curriculum. The drawbacks of an out-dated and teacher-centric curriculum became flagrant during the pandemic. Teachers, students, parents and even the authorities came to know that to sustain in the post-pandemic world, dependence on obsolete curriculum had to be avoided. Besides, as skill development is not part of a curriculum, students lack rapid learning, risk-taking and innovation. Students need to step outside their comfort zone, which is not possible with an obsolete system.

The e-learning process also highlighted the inequity and bias towards poor and disabled students. The respondents hope that in a post-lockdown world, there might be a permanent educational place for the disabled. The lockdown period has also stressed the insignificance of the toxic exam system based on rote learning and teachers expect it to be replaced with a better and advanced assessment



of children. Table 6 shows that 35 teachers expect vocational education to be treated with same respect as other professional courses.

Table 7. What challenges do you expect?

	% of respondents
Mental health issues	30
Self-esteem issues	45
Physical safety	50
Making e-learning interesting	55
All of the above	70

When asked about the challenges expected when schools reopen once the lockdown ends, 70 respondents have said that they will have to address issues pertaining to students' mental health, their self-esteem and physical safety, and on how to make e-learning engaging and interesting (see Table 7). This implies that teachers are well-aware of the damages that the lockdown period may have done to students. Given their experience with e-learning tools and the lacunas therein, teachers expect to face hurdles in making this process more interesting.

Table 8. What are the changes your role has undergone during the lockdown?

	% of respondents
Gaining research competency	50
Adapt to e-learning	80
Support systems for parents	75
All of the above	50

80 out of 100 respondents believe that adapting to e-learning is the biggest change their role has undergone during the pandemic. E-learning is not an integral part of many UAE classrooms and teachers are habitual of the traditional style. Having to teach students in a new format, tackling the challenges *prima facie*, was a major transition. As Table 8 represents, 75 respondents also believe that supporting parents is a big change. Earlier, their relationship was limited to students. However, given the situation, an increasing number of exasperated parents have been contacting teachers.

Table 9. What skills will students require to succeed in a post-coronavirus world?

	% of respondents
Tech savviness	95
Adaptability and Flexibility	80
Creativity	65
Data Literacy	70
All of the above	80

95 respondents believe tech savviness to be a key requisite for students in a post-coronavirus world (see Table 9). The situation has taught them that the future is not possible without technology and anyone who can exploit technologies like AI, big data, etc. will be in a great position. It also can be said for certain that the way companies operate will change. Hence, students will have to be adaptable to the ever-evolving workplaces.

#### 4. Discussion

The problem of the transformation of the learning process as a result of the pandemic and the closure of schools in many countries turned out to be painful for all participants in this process. Difficulties in those countries that rely only or predominantly on the traditional classroom system have

been expected (Radha et al., 2020). However, even those countries in which online learning is sufficiently developed and the digital environment has entered the domestic sphere have been under attack (Masonbrink & Hurley, 2020). The researchers note that in most cases those children, families and university students are affected who do not have economic and social support. The widespread penetration of mobile devices and laptops, which should have facilitated the transition of education to a distance learning level, has not given the expected result (Schwartz et al., 2020). A number of researchers note that even students from developed countries with a developed digital culture turned out to be unprepared for the required level of self-control, limited communication with teachers, and a system of exclusively online assessment (Agarwal & Kaushik, 2020).

Consistent with the UAE experience, similar attempts at applying different types of blended and pure online learning have been applied in many places, particularly, in Georgia, Spain, South Africa, Mexico and many other countries (Crawford et al., 2020). It is still difficult to assess the results of these efforts and research is still ongoing, but studies of the attitude of teachers and students' state during a lockdown show a fairly uniform picture (Rapanta et al., 2020). It can be argued that systemic problems of the traditional type of education turned out to be ubiquitous in most countries, which have been forced to limit education and close schools during a pandemic. Using the example of Spain, which is a developed country with a digital infrastructure, researchers point to an increased vulnerability to the consequences of COVID-19. Foremost among these are:

- various forms of socioeconomic segregation that leads to academic failure and exclusion from schools;
- low culture of networking and collaboration;
- overcrowded classrooms and auditoriums;
- absolutization of educational programs;
- treating education as political currency and speculating in education;
- the need to update the digital competence of teachers (Azorín, 2020).

A completely similar structure of problems was revealed by the present study in the UAE, with the exception of the political component in the field of education. A study of the experience of using the most popular online learning systems provided by Microsoft Teams, Zoom and Cisco Webex (Fauzi & Khusuma, 2020) shows approximately equal ratings from students and a number of data indicate student dissatisfaction with the results of their use (Crawford et al., 2020).

Much research has focused on the digital competence of teachers as a central way of coping with the impact of the pandemic crisis on education (Fauzi & Khusuma, 2020; Rapanta et al., 2020). Various options are proposed for programs to improve the competence of teachers and teachers themselves, as the present research also shows (Khalili, 2020). Digital competence is considered in this aspect not as a possession of appropriate technical skills, but as a different way of creating curricula, communicating and collaborating with a group of students (Siripongdee et al., 2020). In the present study, teachers pointed out the loss of the ability to follow the student-centered paradigm during distance learning. The main skill that is required in the course of promoting online learning on any of the platforms is the need to introduce this paradigm into the conditions of online communication, when a student has the opportunity to build his/her own learning pace (Ariawan & Malang, 2020).

Attempts to quickly solve the problems associated with lockdown and the termination of classroom education have spawned a phenomenon that some scientists call "solutionism": the accumulation of

multidirectional solutions and the use of poorly adapted methods for distance learning (Teräs et al., 2020). Such actions, as the results of the present survey show, have not led to predominantly effective results and have done little to create best practices that can be disseminated.

## 5. Conclusions

The research concludes that higher education in the UAE is impacted by the COVID-19 and thousands of school closures. While teachers are employing online learning tools, they are not able to shift to a more student-centered process. Only 25% of surveyed agreed with the inclusiveness and fairness of use of remote learning technologies for students, while 20% expected that after a lockdown, learning could return to the status quo. 55% of teachers disagreed that online technologies stimulated creativity and had an evidence base. Thus, the research points to a significant imperfection of the applied online learning technologies.

Besides, teachers are faced with challenges in a system of planning, implementing and evaluating. On the bright side, however, the pandemic has definitely opened up opportunities to improve existing teaching-learning methodologies and shift to a seamless integration with emerging technologies. According to 80% of respondents, the online learning system needs further adaptation, and 75% indicated the need for additional support for the participation of parents in education. Teachers are hopeful that the situation will bring about a positive change in the UAE's educational system. 95% of teachers indicated a critical need to improve their technological skills and online teaching methods. They have also experienced a change in their role from just knowledge providers to support givers.

### 5.1. Recommendations

1. Immediate actions and strategies are imperative to ensure continuity of learning in public schools and universities. Open-source digital learning solutions must be adopted so teachers can teach online.
2. Inclusive learning solutions, especially for the marginalized and most vulnerable, ought to be developed. Technology allows extensive access and personalization of education even in the remotest part of UAE. This can transform the schooling system and enhance the efficacy of the entire learning process, providing teachers and students with several options to choose from.
3. There is a need to reconsider existing teaching methods in both schools and colleges through a seamless integration of classroom learning with online learning methods. This will help build a unified learning system. Moreover, it is also crucial to establish quality benchmarks and quality assurance processes for online learning.
4. Strategies are needed to prepare the higher learning field for the changing demand-supply trends, especially those pertaining to the global mobility of learners and teachers, and improve the quality of higher studies in the UAE. Plus, immediate actions need to be taken to alleviate the impact of COVID-19 on job offers, research projects and internship programs.

The study highlights changes in the education landscape amid COVID-19. Schools and colleges have to re-evaluate the curricular interventions to be prepared for e-learning during COVID-19 outbreak. The paper can act as a reference for further works pertaining to the impact of COVID-19 on the performance and efficiency of the educational system. However, there are still a plethora of gaps in the scientific community regarding the impact of the pandemic on higher education. Future studies may assess this impact and collect scientific evidence on how institutions can successfully respond to such outbreaks.

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## **Appendix A**

### **QUESTIONNAIRE 1 FOR TEACHERS**

#### **Q1. How is learning managed during isolation?**

Computer Managed Learning

Synchronous Online Learning

Fixed e-learning

Asynchronous online learning

Interactive e-learning

#### **Q2. Is the technology inclusive, fair and unbiased?**

Strongly agree

Agree

Neutral

Disagree

Strongly disagree

#### **Q3. Does the employed technology have a strong educational foundation and encourage creativity?**

Strongly agree

Agree

Neutral

Disagree

Strongly disagree

#### **Q4. Will you return to the status quo when schools reopen?**

Yes

No

Maybe

#### **Q5. Will the lockdown period work as a catalyst for education reforms that many have been seeking?**

Yes

No

Maybe

#### **Q6. What changes can be expected?**

A permanent school place for students with disabilities

Discontinuation of the toxic exam system

A more up-to-date curriculum

A-level reforms

Vocational education to be given equal respect

Skill development to be part of a curriculum

**Q7. What challenges do you expect?**

Mental health issues

Students' self-esteem issues

Students' physical safety

Inclusivity of education

Making digital learning engaging and interesting

All of the above

**Q8. What are the changes your role has undergone during the lockdown?**

Gaining competency in research

Adaptation to evolving tech-centered teaching

Providing a support system for parents

All of the above

**Q9. What skills will the students require to succeed in a post-coronavirus world?**

Tech Savviness

Adaptability and Flexibility

Creativity and Innovation

Data Literacy

All of the above