

Distance education in higher education in Saudi Arabia in the post-COVID-19 era

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Abstract

COVID-19 has changed the field of education. This paper aimed to re-envision the post-pandemic higher education landscape in Saudi Arabia. This study employed descriptive-qualitative research design. Twenty postgraduates completed a journal task at a public university in the Eastern Province of Saudi Arabia. The responses revealed their first-hand experience of multi-sectorial communities caused by the COVID-19 lockdown, including students, parents and teachers. Results showed that there are seven positive and eight negative impacts of emergency distance education caused by the pandemic lockdown and various themes have emerged, including Social and Educational. To succeed in the post-pandemic era, teachers need to acquire online pedagogical content knowledge and teaching strategies, conduct effective student evaluation and engage students in both virtual and in-person labs and classrooms. This study contributes to quality access of students toward online learning in countries, where distance education is still in its infant stage, such as Saudi Arabia.

Keywords: Distance education, post-secondary education, teacher training, teaching strategies, networked learning

1. Introduction

The spread of COVID-19, a disease caused by a newly discovered coronavirus, led to global lockdowns in March 2020. Towards the end of October 2020, local and national lockdowns began again in different countries in Europe, such as the UK and France, after a period of ease of restrictions, because of a spike in coronavirus cases. The UK government was determined to keep schools open whereas the Ministry of Education in Saudi Arabia in the Arabian Peninsula had decided to continue distance learning until the end of the first term of the academic year that ended in February 2021 (Arab News, 2020). Heng and Sol (2020) point out that the coronavirus crisis has disrupted all aspects of life worldwide, including temporarily halting the life at academic institutions. To ensure the continuity of students' learning, online educational networks and digital technologies have provisionally replaced traditional classrooms by providing web-based form of learning allowing teaching and learning to take place remotely. Salmi (2020) has posited that many nations began to restrict people's movements in the months of February and March 2020. An increasing number of higher education institutions shut their campuses and discontinued in-person teaching. Instead, distance learning was adopted and its popularity rose rapidly. Ultimately, the switch to distance learning impacted 200 million learners across the globe.

Looking back, Dhawan et al. (2020) assert that the COVID-19 pandemic has caused organisations to shift from working from office to working online from home. In China, distance learning (DL) in higher education saw an upsurge at the start of the coronavirus crisis. Within no time, it changed to online classroom settings and forced educators to adapt to the new way of teaching. Ferri et al. (2020) highlight the fact that DL has become essential for instructional practice as a response to the global public health crisis. Distance learning provides a way to maintain contact between students and instructors during the national lockdowns. Alanazi and Alshaalan (2020) affirm that the most significant benefits of e-learning are its simplicity to deliver and accessibility to learning in emergency situations such as the COVID-19 pandemic. They further state that conversations about DL will continue even after the pandemic. Kamal et al. (2020) have also asserted that the unexpected shift to a mix of online and in-class learning is perfectly suited for the situations caused by the coronavirus crisis. As Heng and Sol (2020) have detailed, the use of online educational technology and material has generated numerous terms for describing technology-assisted learning, including electronic learning, online learning, distance learning, blended learning, and hybrid learning.

Alumran (2020) asserts that the lockdown that started on 25 March 2020 has significantly defused a public health crisis in Saudi Arabia. The education systems swiftly shifted from traditional in-class teaching to online teaching, almost as an emergency response. Tanveer et al. (2020) have also highlighted as Saudi Arabia rapidly established a distance education system after halting higher education across the nation due to the pandemic, students faced diverse struggles in adjusting to virtual learning. According to Govindarajan and Srivastava (2020), COVID-19 has compelled educational institutions around the world to push online instruction as de-facto practice and may mark the start of the demise of traditional, in-class teaching. Teymori and Fardin (2020) have detailed how all academic institutions encountered difficulties that forced them to shift to DL even though their faculty and staff were not trained to do so and were unfamiliar with new approaches to teaching and learning. In early March 2020, when a COVID-19 surge triggered the closure of all academic institutions in Iran on the recommendations from the health care sector, the options available to academic leadership disappeared except distance learning.

Zhou et al. (2020) have explained that to date, online learning has been a fundamental approach to learning. At present and throughout the coronavirus crisis, academic institutions have mobilised digital services to inform students that learning centres are closed but that learning will continue online or via DL. Mishra et al. (2020) state that as a result of the COVID-19 pandemic, educational institutions have moved from conventional education system to a new method of teaching through web-based conferencing applications, such as Zoom, virtual classrooms and webinars. Recently,

Lockee (2021) has claimed that online education was previously regarded as a substitute educational mode suited learning at universities and colleges because of the maturity of their students. The emergence of COVID-19; however, impelled teaching and learning communities at various levels to become accustomed to DL. As Liguori and Winkler (2020) explain, the pandemic has driven higher education institutions to adapt rapidly to online teaching and learning methods. In the process, higher education has had to put aside concerns about the quality of online education, and instead raise new questions about how colleges can achieve general acceptance of online learning quickly and successfully. To achieve this goal, devising and developing educational technology is the most feasible route for delivering instruction online.

1.1 Networked Learning, Online Learning and Teaching during the COVID-19 Pandemic

Many schools, colleges and universities in countries, such as Saudi Arabia, were forced to shut temporarily due to the COVID-19 pandemic. There was a concern of the loss of formal learning opportunities for students in full-time education. In-person instruction at colleges and universities was no longer feasible or safe (Dhawan et al., 2020; Fauzi & Khusuma, 2020). Such serious and unexpected situation called for humility and unity. There was an urgent need to keep everyone in the nation safe including students, faculty, and administrative staff. The government also recognized the increasing importance of online learning in this dynamic world. The severe spread of the coronavirus disease propelled the nation closer to online learning almost overnight. Online learning, therefore, has become a panacea in the time of crisis.

Learning is seen as a social practice from which “networked learning” emerged. It is one of the eight principles of networked learning designs and programmes recapped by Hodgson and McConnell (2019). During the knowledge acquisition process, students give social support to each other in the “co-construction of knowledge, identity and learning” (Hodgson & McConnell, 2019). The integral part of networked learning is learners and their fellow learners. Knowledge can be seen as a product resulted from learners connected with one and other forming a ‘web’ of social relations (Haythornthwaite & De Laat 2012). In traditional mode of learning, human entities are the main feature whereas today’s networked learning has a new tool and that is technology (such as various Internet-connected devices, social media platforms, electronic libraries and so on) which helps learners connected to learning resources, co-learners, experts and different learning settings and that is not restricted by time and space.

Unlike networked learning, “online learning” does not specifically focus on human-to-human connections. Rapanta et al. (2020) define online learning as learning that is mediated by the Internet. The sudden adaptation to learning and teaching fully online during the pandemic is first, largely about online learning and not so much about networked learning. And second, as Rapanta et al. (2020) affirm, teachers “have, almost overnight, been asked to become both designers and tutors, using tools which few have fluently mastered”.

Digital learning is a technical apprenticeship that helps students to track time, distance, direction and/or speed. Holzberger et al. (2013) maintain that Multimedia education was established as a means of collaborative online communication; and content and learning methods are designed to improve learning and the effectiveness of teaching or the development of technical knowhow and skills. Fundamentally, in the learning contexts, including asynchronous and synchronized network learning, computers and network connectivity media have been used to break down time and time limitations, full personalised learning dependent on learners (Sousa & Rocha, 2019). In an environment of fast dissemination of information and concepts, the application of digital learning covers a range of fields and industries (Arguel et al., 2019). The importance varies according to different perspectives or opinions. Includes the Internet, social networks, laptops, radio, audiotapes, video cassettes and compact discs, mobile machines. The software includes networking, computer-based curriculum, online collaboration and virtual classes. Lee (2017) affirms digital learning has

been found to be an immersive tool for delivering wired or wireless virtual education tools for online or offline learning. The Internet allows users to link to the website via the network to choose the digital learning material they need, and direct input lets students track the quality of the digital teaching material. The combination of the new teaching practices with resources for digital teaching and learning effectively will also help to develop realistic training strategies (Lai et al., 2012). The architecture of education and the flexible use of digital approaches or immersive learning then become the core issues for today's IT-applied teaching.

1.2 Creating Equitable Higher Education Environments in the Digital World

In response to COVID-19 when attending classes became unsafe, educational institutions such as schools and universities held classes in virtual spaces. In her opinion essay, Wargo (2020) asserts that this is merely a short-term solution while new problems emerge, for example, the "pandemic... exposes the inequities that exist in the remote learning model" (p. 82). The ecology of education is about the interrelationships between physical traditional educational spaces (e.g. a classroom and a lecture hall, etc.) and online spaces. "To best conceptualize the quality of access to education in these intertwined environments, an ecological perspective must be embraced" (p. 82). Therefore, the focus on education, higher education included, should not be technology. Rather, we should create "more equitable higher education environments". Furthermore, Wargo (2020) foretells there is a "third space" for higher education: one where certain functions have emerged as particularly suited to the online model will continue to take place remotely, while other functions will revert to the traditional place on campus (p. 82). Relevant digital education can be fully materialised in higher education only if a successful curriculum change is pursued in structural curriculum frames to understand the values of digital culture (Bellinger & Mayrberger, 2019; Costa et al., 2018). This needs more than technological acceptance or improvements in the teacher's position in institutions (McKay & Devlin, 2016). It also includes understanding the multimedia engagement of students and the outputs of information as ways of learning and evaluation (Khorasani et al., 2012; Govender & Sihlali, 2014).

Any field of culture around the world, including higher education, has been influenced since the attempts to track the spread of COVID-19. Higher education expanded online across the world at the beginning of the 21st century. The capabilities and advancements in digital learning are growing today. With new media networks and robust technical infrastructure, it cannot actually be concluded that the so-called digital natives to use technology in scholarly contexts. The same refers to substantive certification. In addition to intellectual expertise, a prior experience to social media and the willingness to students to focus on digital media affects students' current experience to learning and their interest. In other words, gender, research tools, or experience gaps can influence the further perceptions or behavior of students.

2. Purpose of the Study

This paper aimed to examine the educational and individual experience of multi-sectorial communities caused by the COVID-19 lockdown, including students, parents, and teachers, that may impact the post-pandemic higher education landscape in Saudi Arabia.

The research questions for this exploratory study are the following:

1. What are the positive and negative impacts of COVID-19 that they have experienced during the pandemic from the female MEd postgraduates' perspectives?
2. What is their first-hand experience in the unprecedented situation brought by COVID-19?
3. How would they mitigate the problems caused by the virus outbreak?

3. Methods

3.1 Participants

The twenty participants were in-service teachers enrolled in an MEd course. All the participants were female. They were requested to respond to our reflective journal questions from the perspectives of three roles: a mother, teacher, postgraduate student, or any combination of those. The study participants understood that their participation was voluntary and they were free to withdraw at any time, without giving a reason and without cost. Anonymity is maintained and we identified their sets of responses by their initials: AG1, AG2, AS, ASH, DM, EH, ET, FQ, FG, HM, HX, MA, MM, NG, RC, RH, SD, SY, THM and ZF. The following chart (Table 1) shows the choices of their roles and insights we expected them to offer. Considering that the study focused only on females, their unique responses and views were highlighted in this study.

Table 1. Participants' chosen roles and potential insights

Roles	Number of Participants	Participant's Initials	Insights to be offered
As a mother only	Not applicable	Not applicable	Not applicable
As a postgraduate student only	10	AS, ASH, ET, HM, HX, MA, NG, RG, RH, SD	Learning
As a teacher only	2	FQ, THM	Teaching
As a mother & a postgraduate	1	EH	Teaching/Learning
All three roles	2	FG, MM	Both teaching & learning Plus: parents as stakeholders
Not specified	5	AG1, AG2, DM, SY, ZF	Any of the above
	Total: 20		

Although no participants solely responded as a mother, two among the sample population (namely FG and MM) selected all three roles (mother, student, and teacher) to answer the journal question. Ten participants gave their perspectives as students, and two participants (FQ and THM) responded as teachers. EH gave her input as both a mother and a postgraduate student. They will offer a number of insights into the rapid online transition in learning and teaching, a rapid move to completely online learning and teaching, the long-term implications of COVID-19-related shifts in teaching and learning and the influence of change on instructors, students and institutional processes and preparation.

3.2 Data Collection Tools

The present study employed descriptive-qualitative research design. A journal task was given to twenty postgraduates at a public university in the Eastern Province of Saudi Arabia. The following question was posed to the participants asking them to reflect and write their answers in the journal:

Given the pandemic the whole world is facing today, from your viewpoint, as a teacher, a mother, or a postgraduate, describe in detail three positive and three negative impacts the pandemic has had on you. How would you personally mitigate these issues as a student, a teacher, or a mother?

3.3 Application

Related to Weinhandl et al. (2020), our initial code of study is conducted "in order to split up new data obtained and to produce first sense units" (p. 325). Data is primarily filtered into total expectations, beneficial outcomes and detrimental effects using computerised coding tools. Figure 1 displays the various issues in each "Aggregate Level," for instance social, environmental, emotional,

etc. First, “concrete data text passages and related original... codes have been mixed with different keywords” (Weinhandl et al., 2020, p. 325). Examples of the study of our results are “spiritual” in order to replace “faith” and “capability to fulfill divine duties during self-isolation” in order to “follow God in times of distress.” We have performed a manual analysis of the raw data and found several more relevant studies arising from COVID-19. They are then clustered under the numerous themes set out by the coding programme. For example, “The value of science and technical study” is the focus of “professional research.”

Aggregate Dimensions	2 nd Order Themes	1 st Order Concepts
Overall Perceptions	Positive	<ul style="list-style-type: none"> • Opportunity to improve & develop • Opportunity for a better nation
	Negative Spiritual	<ul style="list-style-type: none"> • ... in many aspects • Blessings in disguise
Positive Impacts	Social	<ul style="list-style-type: none"> • Reduced crime rate/criminal activities
	Environmental	<ul style="list-style-type: none"> • Low CO₂ emissions • Cleaner air
	Emotional	<ul style="list-style-type: none"> • Nationalistic • Sense of duty
	Professional	<ul style="list-style-type: none"> • Enhance independent learning, collaboration skills, technical skills, time management skills
	Educational	<ul style="list-style-type: none"> • Develop education strategies • A test to the education system effectiveness • Improve teaching & assessment • Provide a variety of educational resources
	Community	<ul style="list-style-type: none"> • Community spirit & global unification • Opportunity to work from home • Traveling time not required
	Personal	<ul style="list-style-type: none"> • Spend more time with & pay attention to family members
	Familial	<ul style="list-style-type: none"> • Find God & practice faith in difficult times
	Spiritual	
		Social
	Emotional	<ul style="list-style-type: none"> • Boredom • Confinement

Negative Consequences	Economic	<ul style="list-style-type: none"> • Fear • Financial burden on the nation • Economic stagnation in the country
	Healthcare	<ul style="list-style-type: none"> • Difficulties in accessing routine medical check-ups for the elderly

Figure 1. Highlight of the coding tables of the research findings

3.4 Data Analysis

The three major dimensions resulted from the machine-coding show the participants' overall perceptions that branched out into some positive themes, many negative themes and a spiritual theme, which in particular, reveals that the participants saw the pandemic as blessings in disguise. The detailed positive themes include social, environmental, emotional, professional, educational, community, personal, familial and spiritual. By contrast, social, emotional, economic and healthcare are the integral part of the negative themes. The details of what have been found under the themes of social, educational, institutional and professional are illustrated in the following section.

4. Findings and Discussions

4.1 Overall Perceptions

Analysis of the data indicates that a spiritual theme runs through the respondents' overall positive and negative perceptions of the coronavirus pandemic. Four out of twenty (20%) of the participants (AG1, AG2, DM, and FG) made sense of the pandemic based on their religious convictions. DM, too, has learnt about the power of faith that helped people to adapt to these unexpected events, and she felt grateful for God's blessings now that she has come to feel her love for the world. Another respondent, FG, quoted a saying of Prophet Mohammad: "I am amazed by the believer. Verily, Allah does not decree anything for the believer except what is good for them", meaning it does not matter whether you are experiencing ease or hardship; it will improve you.

4.2 Positive Impacts on the Teaching Profession and Education caused by the Pandemic

Most participants gave a minimum of three positive impacts resulting from the lockdown when people were required to stay at home, and when such activities as travelling to work or university, shopping for groceries or visiting family and friends were no longer possible. Some respondents listed only one advantage, and a few provided more than three advantages. Overall, they gave sixteen positive impacts the pandemic caused that had emerged into themes of Social, Environmental, Emotional, Professional, Educational, Institutional, Community, Personal, Familial, Spiritual (or Values and Beliefs), and Other. However, this paper will focus mainly on the themes that concern with education, for instance: Professional, Educational and Institutional. The following seven positive effects on education-related matters will be further discussed. The themes are indicated in open and close brackets "(...)" as presented below. Details, such as simple percentage analysis and some of the translated text from the respondents' reflective journal entries, are illustrated in the following paragraphs:

4.2.1 No disruptions to learning during the pandemic (educational). One-fifth (20%) of the participants were appreciative of the continuation of learning during the pandemic. The continuation was made possible with support from the government and the universities. For instance, MM's son was enthusiastic about studying remotely and hoped this mode of education would last, which provided online learning programmes and lessons via various educational

platforms. He was able to receive support from his teachers and engaged in various interactions with his peers during the lockdown.

4.2.2 Good experience with distance learning (educational). Almost half (45%) of the respondents stated they had a positive experience with DL, which came with online learning materials and resources. HM, in particular, had a good experience with DL during the pandemic; many online evaluation tools and digital calendars packed with learning activities were available, together with the use of Blackboard (LMS).

4.2.3 The good work of education providers (professional). Almost one-third (30%) of the respondents were impressed with the work that education providers had achieved during the pandemic. One participant saluted the enthusiasm profusely manifested by the education providers. There was an *ad-hoc* training at the start of the lockdown and that covered e-lesson preparation, professional lesson delivery, teacher-student virtual interactions to develop students' independent learning, communication, and online submission skills. HX was "able to attend several scientific discussions [across] various Saudi universities through the Blackboard platform as well as Zoom." She further said the teaching staff was eager to invest the spare time they had to provide students with research consultations via various social media.

4.2.4 Emerging importance of distance education (DE) (professional). Like the participants in Alghamdi and El-Hassan's (2021) research on emergency distance education in Saudi Arabia during the pandemic, the majority (70%) of the participants realised the value of DE and independent learning skills. To be specific, "Emergency Remote Teaching" (ERT) occurs when learning programmes are offered online in response to a crisis or disaster, such as the current pandemic. Without DE, the learning of university students and schoolchildren would have been disrupted. They also think that it is high time Saudi Arabia developed and promoted remote learning. However, blended learning – a mix of online learning and traditional face-to-face teaching – would remain relevant in the post-pandemic period.

Among the supporters of distance learning, AS was the first one to envision future education without the human element, such as human instructors. FQ underscores the increasing importance of independent learning skills demonstrated by the current crisis. RH educated herself by learning new strategies of conducting distance learning, which are a set of the "21st-century teaching skills" in her opinion. Likewise, RG stresses that independent learning is the basis of 21st-century learning. NG said, "my view of distance learning and blended learning have changed, and their importance in university education [is now noticeable because online] activities and tests [are easy to follow and are achievable]." Because of the lockdown, SY hoped that this would help decision-makers change their mind regarding distance education, which she felt is sorely lacking in these exceptional times. ZF said, "...the traditional systems of education did not take this [distance] education seriously, and it took a crisis of this magnitude to prove its value and effectiveness."

4.2.5 Practised Essential Soft Skills other than Independent Learning (professional). From the student responses, several essential soft skills stood out because of the lockdown. The respondents needed to apply these skills in order to readjust to the new situation. These are time management skills, IT skills, self-directed learning skills, communication skills, teamwork and collaboration skills, crisis management skills, and organisation skills.

Time management has become more critical than ever to guarantee success and achieve goals during the pandemic. RG said, "we face... distractions [but have] responsibilities toward ourselves, our families and our country, and the multiplicity of technological affordances is distracting and time-wasting." AS and NG discovered that she could adapt to change and continue their education during those chaotic times. Students also need IT skills to attend online courses and conferences. THM pointed out that communication and collaboration skills could enhance the productivity of citizens working from home. RH said, "one of the merits of the pandemic was that it helped me learn

to manage personal crises, and encouraged me to manage my life in unusual circumstances.” NG put into practice her organisation skills so she could take care of both her family and her studies. HM emphasised that self-direction is crucial, and that taking responsibility can help people to achieve goals, especially during a crisis.

4.2.6 Alternatives to do different things (professional). Almost half (45%) of the respondents discovered that there were alternatives to many things they used to do before the pandemic. For instance, HX had the privilege of completing simultaneous online assessment because universities were allowed to provide alternatives to on-campus final exams. Instead of travelling to an actual university library to browse books and printed resources, digital libraries were accessible. HX stated various universities allowed free online access to their digital content. ASH said, “people... manage their lives during a crisis under these extraordinary circumstances and... find alternatives in everything, togetherness, and working in the spirit of one community.” MM did not feel separated from the rest of the family or her friends because technology helps them stay connected. Also, HM stated that her regular routine was no longer possible. However, the use of electronic stamps and signatures of transactions were alternatives to completing some transactions at university, which were disrupted due to the virus pandemic.

4.2.7 Institutions’ reactions and people’s perceptions concerning research (institutional). Two respondents identified the importance of research. ZF shared with the researchers that the scientific research conducted during the pandemic on responses to crises threatening the continuity of education flourished. Another gave King Saud University’s coronavirus research initiatives as an example. As well, ASH said, “people’s attention has turned to scientists, laboratories and scientific research, and this pandemic is instrumental in developing systems and creating structure for research and studies.”

4.2.8 Negative Impacts Triggered by the Pandemic

Here too, the manual inspection of the data uncovered themes and details that the computer-assisted coding could not. Although one student (AG2) did not attempt this part of the task, the rest gave a minimum of one negative impact of the pandemic. A few other students gave more than three examples. They also contributed a good number of possible solutions to these impacts showing their optimism and resourcefulness. Below is a list of their answers presented according to their themes:

1. Isolation, social distancing, and mental health (Social)
2. Online/Remote teaching and assessment (Professional)
3. Face-to-face communication between members of the same gender (Professional)
4. Busy traffic on the Internet and poor distance education infrastructure (Educational)
5. Inaccessible learning resources (Educational)
6. Students of different backgrounds and educational needs (Educational)
7. Lack of on-site lab work and practicums (Educational)
8. Educational facilities remained idle (Institutional)

Details, such as simple percentage analysis and some of the translated text from the respondents’ reflective journal entries, relating to above eight key points are illustrated in the following paragraphs:

Isolation, social distancing, and mental health (social). One-fifth (21%) of the respondents worked from home, and that meant they felt socially isolated. When children were also staying home, their

daily schedule was packed with housework, supervising the children, completing assignments, and more. AS felt bored.

Less than one-fifth (16%) of the respondents thought they figured out what the issue was of social distancing: “mental problems”. FG and ET said they were not able to visit the elderly; failure to visit the parents, the lack of giving condolences for those who died during this period, and the cancellation of social events in all their forms caused many people mental stress. ASH gave two other examples of the consequences of the lockdown. First, borders were closed, and people were not allowed to travel to visit their friends and families. Second, the ban on cultural and sporting events and activities “that connected members of societies, [was] causing psychological effects on individuals and societies.”

Online/Remote teaching and assessment (professional). Four students (20%) expressed their dissatisfaction about their experiences in distance education. ZF and HM point out that some faculty do not possess remote teaching skills. For her part, FQ highlighted two issues with distance education, one being the difficulty they faced while assessing students, particularly the lack of effective tools for evaluating remote learning. The other issue is parents’ negative attitudes towards distance learning, which meant that many of them shunned online learning and dismissed its value, even though it was instituted to ensure the continuity of learning for their children during the pandemic in the first place.

RH shared her insights into how pupils responded to virtual lessons; young children became unruly when the learning programme was running on-screen. This was because they could learn better when they physically interacted with their peers. However, this was not possible due to the lockdown. Even the older (female) students found they could not use body language as part of their communication during their online presentations and interactions with the audience. From a student’s perspective, HM found the workload became very heavy, and she felt under pressure to complete the tasks. She attributed the accumulation of work to her being confined at home “where there are household chores, homework, study, assignments, and much else” to complete.

Face-to-face communication with the same gender (Professional). HX and EH found it crucial to have direct, face-to-face communication with colleagues and students, females in particular, to be able to discuss current issues and to collaborate. They emphasised the need to communicate directly with faculty members to raise queries and to obtain information and instructions from them.

Busy traffic on the Internet and poor distance education infrastructure (educational). A majority (68%) of the respondents experienced technical problems caused by heavy traffic on the Internet, and one of them pointed out that the DE infrastructure was poor. In particular, both NG and SD found the Internet speed became slower because everyone was staying home, especially children, who always want to be connected. NG was also honest about her computer problems and lack of IT skills, including slow typing skills. Some participants could not access digital libraries due to poor Internet connection; Internet connectivity had repercussions on the delivery of EH’s exam grades and communication between teachers and students.

These findings corroborate those identified by Alghamdi and El-Hassan (2021). In their study, 20 out of 140 participants (14%) complained about technical issues encountered during the virtual learning conducted during the lockdown. The researchers classified these complaints into four main types of technical issues the participants experienced: 1) no laptops, indicating glaring evidence of a digital divide; 2) no Internet connection; 3) poor Internet connection and its consequences and 4) unfair grade calculations in the LMS.

Inaccessible learning resources (educational). More than a quarter (26%) of the participants expressed difficulty in accessing learning resources. Specifically, MA and RG found that digital libraries were not accessible due to poor Internet connection and IT issues. AS found it difficult to

obtain “some printed references that are not available electronically,” while EH said postgraduate students were not given access to e-learning or distance learning materials at all. Like AS, HX pointed out that the learning resources on the library shelves are precious, but electronic libraries did not store all those resources online. Finally, for SD, the ideal place to study is a real library with paper-based learning materials and, in particular, NG desired paper-based books over electronic ones because this was what she paid for. A cloud-based digital library is only a second best.

Students of different backgrounds and educational needs (educational). MM pointed out that students with special educational needs (SEN) require real-life interactions with their tutors and carers and that remote learning cannot do much for them. Similarly, RH said young children from low-income families need support and need to attend classes as well. They also need to be provided with computers in order to benefit from DE. Student access to computers was a common problem during the pandemic, according to HM and RH.

Lack of on-site lab work and practicums (educational). THM pointed out that given the inability to use a laboratory, scientific experiments could not be performed as a learning activity. Bernhard (2018) quite rightly points out experimental technologies available in a lab, apart from computers, are tools of learning. Traditionally, a lab is a place where students visualise phenomena and explore knowledge with their peers.

Educational facilities remained idle (institutional). AS was sorry that spaces, which were built for the traditional mode of education, were not in use. With a similar sentiment, HX felt a sense of loss when the halls of the university library remained idle.

4.3 Possible Solutions

Every participant contributed ideas on how to counteract the crippling effects of the Coronavirus. As a general statement, ASH boldly offered this as a possible solution: “By preserving and observing the instructions issued by competent authorities to stop the spread of the Coronavirus pandemic until a treatment or vaccine is [created as a cure] for this epidemic, ... life will return as it was before economically, socially, scientifically and politically”. Mitigation of the limitations of DE, social isolation, and economic issues were suggested.

4.3.1 Busy traffic on the Internet and poor distance education infrastructure. To offset heavy traffic on the Internet and improve the poor DE infrastructure, there are five actions to take. First, strengthen the DE infrastructure and reform the existing educational system. Second, telecommunications companies should provide reliable Internet services to citizens. Third, subscribe to 5G for better broadband cellular networks. A number of nations, such as South Korea, China and the USA, have unveiled the fifth-generation mobile broadband technologies to enable users to upload and update more easily. The time required for devices to link to wireless networks has declined significantly compared to previous years. In addition, we need to deploy hardware that is more robust. It is also essential to instruct students to register for lectures (for ease of contact), produce recordings of these lectures, and make these available after the live delivery of lectures.

4.3.2 Online/Remote teaching. As illustrated in the Positive Impacts section, the majority of the respondents applauded the implementation of distance education. ET put forward another possible solution consisting of the promotion of DE. The participants made the following suggestions on what universities, research bodies, teaching staff, parents, and individuals can do to implement DE.

To begin with, *universities* have several major actions to take. It is crucial for them to improve and promote DE by requesting management and decision-makers to take action in this direction. Not every student has access to technology; therefore, universities need to provide laptop computers to students in need and apply mobile apps to run remote meetings. Universities also have the responsibility to offer alternatives, for instance, virtual labs, independent students’ practical application, virtual student presentations with explanations of experiment notes, results,

interpretation, and analyses. Furthermore, teacher preparation programmes need to be reformulated so that teachers can prepare and make use of effective and fair evaluation tools for DL. The existing evaluation tools are not adequate; thus, we need to learn about effective online evaluation tools from professional educational communities. Universities should also provide new training courses so that teachers can be supported and can deliver excellent lessons to their students. One participant pointed out that universities need to understand and apply the principle of strategic partnership in the educational process. For instance, not only the university, the teaching staff and the students are involved, but also other global educational communities to be included in the partnership to provide good DE.

The respondents recognised the importance of *research* because of the pandemic. It is crucial to organise time, prioritise, plan well and coordinate research on remote learning and DE. By conducting research, we then understand the effectiveness of DL tools and platforms, and then develop DL by formulating, introducing and carrying out policies on adopting DL. To commence such endeavours, we need to discuss with professionals on how to conduct research on DE successfully.

There are many things that *teachers* and *faculty members* can do to support DE during a pandemic when face-to-face interactions are not possible. First, teaching staff should provide educational and daycare plans for the family to follow, help SEN children to exercise (which they usually do at school), and help families learn exercise routines by following YouTube clips. Second, teachers' contact information should be provided to parents so they can interact with them directly regarding their children's progress and thus provide further support to the family. Again, teaching staff should use effective online evaluation tools. In addition, it is important to follow up with students to increase the level of communication until problems are resolved. Video-conferencing tools such as Zoom for remote discussions with students can be used. Moreover, teaching staff need to help students to graduate on time in the case of sudden unexpected events, such as a global pandemic. Respondents also recommended that blended learning be employed while DE may become predominant.

Parents play an important role in the success of DE. Thus, it is important to raise parents' awareness about the need to continue education for the young ones. This is an opportunity to learn how to cope with crises, how to stay motivated, and so on. Also, DL is vital for building independent and self-directed learning skills preparing children for lifelong education.

As individuals, we all need to build time management and organisation skills and learn digital citizenship. Furthermore, RH made a list of possible solutions to engage young children with remote learning (RL): (1) Divide pupils into small groups of between 2 to 4 pupils and create an environment similar to the actual classroom that allows them to see each other, speak together, study together, and work on projects together; (2) Prepare programmes for the people who are most in need of RL support; (3) Use interactive educational programmes that encourage students to get involved and become enthusiastic about the virtual classroom to solve the problem of the teacher not controlling the elementary grades students; (4) Use learning reinforcement programmes to encourage students to learn in a virtual class.

Figure 2 below summarizes the mitigation on online teaching and learning suggested by the participants of this study.

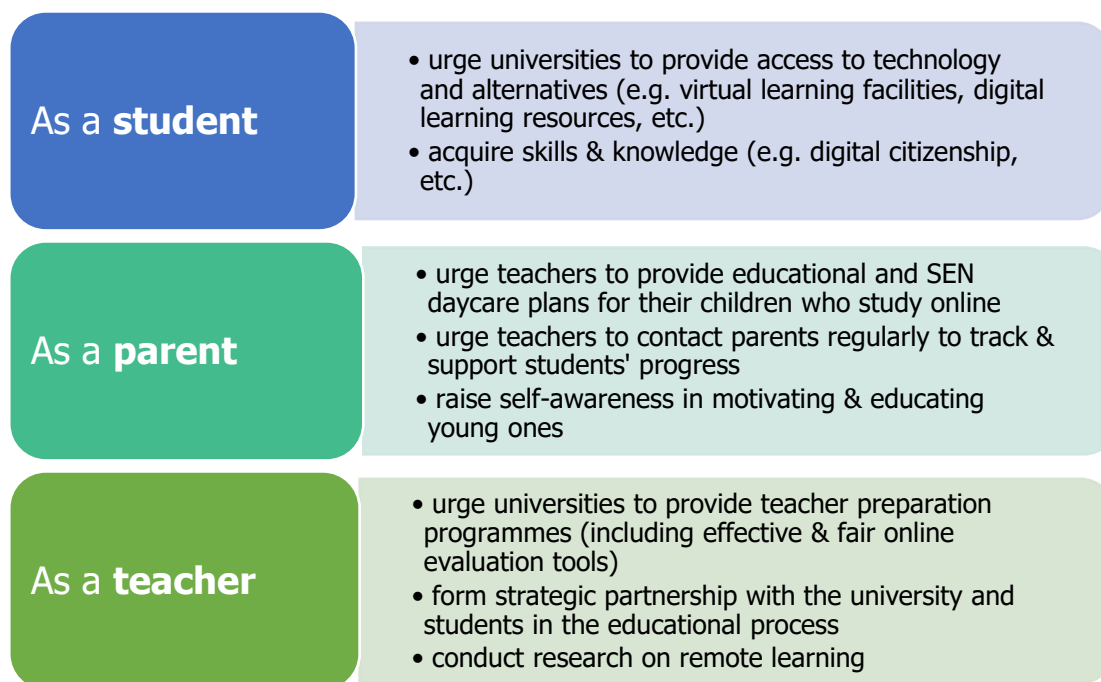


Figure 2. Mitigation on issues of online teaching and learning

4.3.3 Lack of access to the library and its learning resources. In the experience of one of the respondents, it is important to prepare a study room as a substitute for a library desk/space. However, universities need to make open online resources available and give postgraduates access to e-learning and distance learning programmes. In addition, electronic libraries should make sure they store online all the resources available in the actual libraries. Moreover, publishing houses can make books available by offering home delivery, and allow students to pay affordable charges and the ultimate goal of it is to protect the writers' copyright.

5. Conclusions and Recommendations

The building of reliable Internet infrastructure to run DE is essential; Internet networks need to be strengthened so that people in all parts of the country can go online in both peaceful and exceptional times. A high-speed Internet connection alleviates frustration and minimises disruptions of learning programmes, online assessment, and digital library services. The issue of inequality in connectivity must be addressed (World Bank, 2020, p.7). Although many electronic learning resources are available, some valuable printed academic materials have not been digitised yet; thus, they are not accessible electronically. Students should be entitled to a computer of their own or on loan from the university. The government of each country should see to it to ensure every learner is equipped with an electronic computing device to get connected to the Internet, and so the business of education can proceed remotely.

In the post-pandemic world, the delivery, infrastructure, and processes of online teaching and learning should improve; it should also be blended with traditional classroom teaching. Members of the learning community collaborate and create knowledge actively by upholding the principles of networked learning instead of merely online learning. The term "hybrid education" mixes elements of online and in-person education" (McKenzie, 2020), and it has gained added prominence ever since COVID-19 plunged the world into chaos. The social element of learning, whether it is of traditional or online mode, is critically important. Many students learn well when social interactions are possible and some struggle in maintaining their mental well-being during the confinement period when social distancing is observed (Chaturvedi et al., 2021).

In order to foster the conditions for hybrid education, the following areas will need to be developed and improved. They include IT training, online teaching skills, online student evaluation tools, online educational platforms, virtual labs and classrooms, independent learning skills, online presentation skills, communication and collaboration skills (including teamworking skills), and online learning activities and programmes (to engage with students of all ages and those with special needs from different economic backgrounds)(World Bank, 2020, p. 4, 5 & 7). Other personal and professional development skills such as time management, self-management, organisation and prioritisation, and crisis management are vital. Decision-makers, educational authorities, and other stakeholders in DE will need to work together in order to make it happen. There also has to be buy-in on the part of parents, so they lend support to DE, as it will play an increasingly important role in the 21st-century education.

What faculty experienced during COVID-19 is ERT (Emergency Remote Teaching) as mentioned previously. However, for the immediate future in the post-pandemic years, effective online learning must provide well-planned online learning experiences. Forward-thinking educators need to consider the complexity of online learning design and decision-making processes (Hodges et al., 2020) to make students' learning deep, rewarding and valuable. For professional preparedness, teacher professional development in online teaching is crucial. Teachers need to acquire pedagogical content knowledge (PCK) and be updated on pedagogical methods whether online technologies will be used or not (Rapanta et al, 2020). Notably, this is a small-scale study that only involved twenty female postgraduates. For a better understanding of the experiences of male university students and male/female faculty on engaging with ERT during the pandemic, larger-scale research with more variable including utilizing more sophisticated research approaches and designs is recommended.

In conclusion, educational institutions (schools, colleges, and universities) in Saudi Arabia primarily focus exclusively on conventional learning practices, that is, they adopt the typical set-up of face-to-face lectures in a classroom. While some higher education institutions have now begun integrated learning, a few of them remained trapped with old procedures. The unexpected spread of COVID-19 threatened the education frameworks worldwide, and compelled educators to switch overnight to an unfamiliar online teaching environment for continuity of education during the lockdown. This paper has identified the potential impact of the higher education environment in the post-COVID-19 period in Saudi Arabia and countries that share similar characteristics on multi-sectorial communities such as students, parents and teachers. Strong Internet infrastructure is the backbone of DE; therefore, countries such as Saudi Arabia need to strengthen their citizens' access to reliable Internet with good speed so that students, parents and teachers can benefit from it and teachers can do their job. Access to the Internet allows users to engage with online learning activities with a good provision of digital resources; however, governments should ensure access for every student to an electronic computing device. In the post-pandemic era, a new learning environment will emerge and "hybrid education" will become prominent. To succeed, professional development opportunities should be given to teachers to acquire pedagogical content knowledge, effective online teaching strategies, and 21st-century skills, such as problem solving, crisis management, and collaboration, and to achieve digital literacy, effective online student evaluation, and full engagement in both virtual and in-person labs and classrooms.

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