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Review Article

Shifting focus to online learning during the COVID-19 pandemic in Saudi Universities: Challenges and opportunities

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Since 2020, Saudi administrations have provisionally closed educational institutions to mitigate the spread of COVID-19. At the time, employing technology was imperative to accelerate learning efforts and offer methods of enhancing interactions between learners and among learners and tutors. In this review, I first describe the e-learning systems that were used in higher education before the pandemic. Then, I investigate the impact of COVID-19 on Saudi higher education and how universities and public educational institutions responded to the pandemic. In the conclusion, I argue that policymakers, university sectors, and syllabi developers should unify national e-learning strategies, integrate technology in a systematic way, and design e-learning curricula to meet the needs of an ever-advancing world and revolutionise the learning process.

Keywords: COVID-19, e-learning, policymakers, educational system

1. Introduction

People around the world were generally surprised at the emergence of COVID-19, which first originated in the city of Wuhan, China, in November 2019 and quickly became a global pandemic. As suitable protective and therapeutic processes, such as vaccines, have not yet been accessible to the entire world, the only solution to slow the virus was self-isolation (World Health Organization, 2020). In Saudi Arabia (SA), the education sector was not immune to the pandemic's widespread impacts. Following the restrictions on physical contact imposed on students and teachers, the initial educational responses adopted were university closures and the delivery of online teaching and learning. This review discusses the situation of e-learning in higher education in SA before the COVID-19 pandemic, the effect of this pandemic on the education and e-learning systems, and how Saudi educational sectors responded to the crisis by activating virtual learning. The conclusion outlines some insights that may assist those in university and educational sectors, including syllabi developers, in delivering e-learning to accomplish better learning results.

2. Context of e-learning in higher education prior to COVID-19

The Saudi government has formulated a novel vision for the nation, referred to as Saudi Vision 2030 (2018). Saudi Vision 2030 articulates the goal of building a robust economy with an increased focus on knowledge in SA, which can be developed by 'increasing the performance efficacy, [and] using the latest support technologies in [*sic*] education system' (Ministry of Education, 2017). In 2018, the government spent $192 billion on education (Invest Saudi, 2018). This budget helped the educational segment in professional training and advancement, formulating effectual syllabi, and incorporating technological tools. The National Centre for e-Learning and Distance Learning (NCeL), which is accountable for enhancing e-learning programme and designing an appropriate learning ecosystem for technology incorporation into course syllabi, is responsible for implementing and supervising e-learning vision.

The latest investigations have shown that universities in SA have encountered problems in integrating technology. These obstacles include the inferior quality and formulation of e-learning courses (Alebaikan & Troudi, 2010). According to Al-Jarf (2007), 'standards, rules and regulations for using online courses are absent' in SA. Furthermore, there is an absence of empirical studies on how to direct research and practice to pedagogically integrate and evaluate technology (Albugami & Ahmed, 2015). In addition, there is minimal accessibility of training courses in technology (Al-Gamdi & Samarji, 2016) and difficulties moving from traditional learning to technological ecosystems (Alshahrani & Ward, 2014), along with issues in transforming teacher-centred strategies to student-centred approaches, whereby the students have passive roles in learning (Alebaikan, 2010). According to Quadri et al. (2017), '. . . it has been seen that the effective implementation of e-learning through many Saudi Arabian Universities do [sic] not seem proportional to the huge government investments in technology for education' (p. 96).

3. Saudi Arabia education system during COVID-19

3.1. How the Saudi Arabia education system has responded to COVID-19

Since March 2020, Saudi officials adjourned university operations until further notice in an attempt to prevent the spread of the coronavirus pandemic. Presently, faculties have converted their teaching to an online environment. Unfortunately, the rapid transition of universities to online work is not a demonstration of online pedagogy, but rather one that has illustrated how poorly equipped educational institutions are, and how disadvantaged students/teachers are whose access to technology and the internet in an online environment has been restricted. In the first part of the pandemic, as mentioned by Ministry of Education (ME), 'as per universities, the decision to call up administrators or faculty will be left to university directors as they will need to continue online courses and see what fits their curricula (Naar, 2020, *para. 5*).

Various students have been left without the provision of proper technological resources, such as the internet. Also, instructors do not have sufficient ways to integrate these technologies into pedagogical methods. Within the existing constraints, Saudi universities have started using a learning management system (LMS), and various online workshops have been conducted to facilitate its use. In the second part of the pandemic in mid-2020, the ME stated that distance learning has become a tactical futuristic choice that needs constant development (Naar, 2020).

3.2. Conducting research during the COVID-19 pandemic

Before explaining the education system situation in SA during the COVID-19 pandemic, it is important to compare the technological readiness of higher education institutions in the Gulf Cooperation Council states during the pandemic in order to gain a clear understanding of the education systems in this region as well as obtain a deeper understanding of their educational problems. These countries share similar cultural identities and political and economic systems, are among the wealthiest countries in the world and have positive economic growth based on oil revenues. However, it is important to note that their "governments are not sensitive about education and that the education indicators are not very good" (Erdoğan et al., 2020, p. 193). For example, Al-Taweel et al. (2020) stated that Kuwait's complete transformation to virtual education during the COVID-19 pandemic cannot be considered an appropriate example of a virtual environment due to generalized dissatisfaction among students and some learners' lack of suitable technology, such as hardware, and inadequate network access to online sources. Technology integration also needs an appropriate blueprint and planning that involves coaching teachers on technical problems to anticipate and expectations when engaging in e-learning programmes. Furthermore, Kuwaiti supervisors in the Ministry of Education should be accountable for managing the education segment during the pandemic (Alhouti, 2020). Meanwhile, Hussein et al. (2020) carried out a case study in the United Arab Emirates in which they observed that stakeholders provided inadequate assistance to teachers regarding lecture presentations. Furthermore, staff members did not receive suitable training on conducting online classes, which frequently had a negative effect on the learning process.

Regarding Saudi context, a survey conducted by the Harvard Graduate School for Education (2020) to investigate the readiness and response to COVID-19 around the world reported that in SA, the shortage of practical knowledge on integrating digital technology, online teaching strategies and educational curricula, students' emotional competencies, teachers' professional development in information and communications technology skills, and assessment tools hindered the provision of quality instruction. Also, a study conducted in Saudi and Jordan universities during the COVID-19 pandemic found that 'the challenges facing the usage of e-learning system are not only limited to the infrastructure issues [–] but also include other such as e-learning system technical issues, change management issues, course design issues, [and] computer

self-efficacy' (Almaiah et al., 2020, p. 5276). Furthermore, Khalil et al. (2020) carried out a qualitative investigation to study the Saudi learners' viewpoint about online education in the COVID-19 pandemic. The researchers observed an adverse facet from the learners' perception, that is, the learners were facing methodological encounters, which comprised quality assertion problems in the content and delivery of the lectures. Additionally, studies have been done by Al-Jarf (2020) and Ebaid (2020) indicated that the students showed lack of learning objectives and motivations, taking passive roles and having low levels of self-efficiency, and learner-interaction during the online learning. Additional investigation was carried out by Alqurshi (2020) in which around 700 pharmacy pupils, from 19 distinct regional colleges, and 74 teachers from 10 discrete regional colleges were part of the investigation. Around 60 per cent of faculty members have conveyed worries on the absence of learner-learner and learner-tutor communications, which is an aspect that has displayed an extensively negative association with total learner contentment. On the basis of teacher reactions, Alturise's (2020) study, that were conducted at Colleges of the western branch of Qassim University, presumed that around 59.08 per cent of teachers were in agreement that it was difficult to enable the course targets with the use of online mode of study because the electronic course material varied in the online course and was not similar to the one learnt prior to COVID-19. He stated that the students found that "it is difficult to have discussions during online courses in order to solve queries, and this diminishes their problem-solving capability" (Alturise, 2020, p. 74).

Therefore, given the restrictions on physical contact, universities should be prepared to modify their curricula and pedagogical strategies to ensure that students are engaged and able to concentrate in a normal (post-pandemic) classroom. Finding practical solutions should be the goal, which will be discussed in the next section.

4. Toward the future: Implanting e-learning in Saudi Arabia

In the post-pandemic period, there will be changes in the realities of education in SA. As stated by the ME (2020), one of the unavoidable changes that should be expected after the pandemic is the total shift from traditional education to virtual instruction for some courses. Another change is the perception of online education from a complementary mode of education to the primary means of teaching and learning. Hence, Saudi educational sectors should prepare to embrace quality online education beyond occasional emergency practices necessitated by challenges such as COVID-19, and it is important to find solutions to challenges militating the effectiveness of virtual teaching and learning.

Among some approaches that can facilitate the effective integration of technology in higher education are the 'systematic approach [that] should be considered which is a combination of top-down, bottom-up and inside-out processes' (Ayotola & Abiodun, 2010, as cited in Turugare & Rudhumbu, 2020, p. 3595). According to Turugare & Rudhumbu (2020), the top-down approach aims at effectively managing

the institution. Institutional management suggests supervision of information technology services within the institute, and strategic policies and procedures for delivering e-learning. The second approach consists of executing workforce planning methods for efficient technology integration in the institution (Turugare & Rudhumbu, 2020). In the third approach, the perception and behaviour of the learners and tutors should be regarded as vital characteristics in efficient technology integration. These aspects suggest that the tutors should be given training in the use of fundamental computer use for which a pedagogical prototype in the classroom must be given (Etmer, 2005; Turugare & Rudhumbu 2020). Furthermore, an education prototype for learners to develop their skills to identify learning goals, execute learning tasks, evaluate their learning achievements, and search for information should be accessible (Bitner & Bitner, 2002; Turugare & Rudhumbu 2020). The implications for policymakers, syllabi developers, and university sectors in higher education will be presented according to these three approaches.

4.1. Implications for policymakers in higher education

4.1.1. Top-down approach

In the top-down approach, policymakers are responsible for supervising and formulating policy decisions (Turugare & Rudhumbu 2020), which requires consideration of e-learning vision and regulations regarding the integration of technology to sustain a high level of support. Then, they need to move to the lower level of the organisational hierarchy, after which these policies can be specified and contextualised by university sectors.

E-administration and supervision systems are essential, as they assist in the production of a learning association ecosystem among policymakers that facilitates managerial strength and creates the technology benchmarks for university sectors. These include visions, strategic policies for technology integration, e-curriculum design, professional competence, assessment, and evaluation (Technology Standards for School Administrators Collaborative, 2001).

In establishing a vision, stakeholders, such as supervisors, managers, mentors, and learners, need to participate in the visualisation procedure, which 'creates conditions under which all other decision making takes place' (Braman, 2012, p. 2). It is imperative that the vision proclamation signifies a solicitation to own the future jointly. According to Liedtka (2000), a procedure that energises a large portion of the public via mutual discussion and coordination will enhance the value of strategic planning to a robust extent. Also, due to the lack of policies and regulations regarding e-learning systems (see section above), policymakers need to develop a broad outline of e-learning best guidelines for educational segments by concentrating on the integration of an e-learning platform. Computer-mediated technology is an emerging development; hence, the main target is clear standards for the implementation and evaluation of e-learning attributes. With digital responses and policies that highlight online learning, the pandemic is likely to result in an unprecedented wave of innovation in online learning at all levels.

Additionally, these policies should recognise the social, legal, and ethical problems linked to technology and develop reliable methods for decision-making associated with these problems (Technology Standards for School Administrators Collaborative, 2001). For example, to mitigate this growing digital divide, every disadvantaged individual should benefit from technological advancements. There is a need for Saudi private sectors to cooperate with government (i.e., technology and telecommunications actors) and commit to providing permanent broadband internet access to underserved communities and people. Efforts must be made to ensure that the required infrastructure and systems are available and capable of coping with future lockdowns to minimise the effects. This cooperation will lessen the financial burden from government, leading to the rapid capacity expansion of online learning and its infrastructure to meet the aims of the fourth goal of the United Nations' SDG (to ensure inclusive and equitable quality education and promote lifelong learning opportunities for all).

For the criterion which is related to e-curriculum design and the strategic protocols of technology integration, policymakers should consider the relevant curriculum design policies and study how ecosystems incorporate technologies. Upon reviewing NCeL policy, it is evident that no data or publications are available about the execution of computer-facilitated syllabi and the design of online programmes (Aljohani, 2019). Therefore, NCeL should encourage the improvement of e-curricula by promoting research, development, and the authentication of industry-education collaboration among universities and private sectors. Also, no distinct insight is available regarding the methods NCeL have used in integrating technology and formulating e-curricula. It is unfeasible to identify whether these attempts have been made to assess these courses. As a result, there should be unified national versions and plans in the technology integration, curriculum design and evaluation process, which would promote some flexible guidelines for university sectors and syllabi developers to design, implement, and evaluate e-learning environment and e-curriculums. This would lead to creativity and modifications based on target needs and learning objectives of each Saudi university.

Lastly, policymakers should establish a broad set of principles for professional competence for both students and staff members. This includes the creation of guiding criteria for the interactional and effective use of technology and increasing awareness among the students and other university members of the benefits of educational technology in improving productivity. Furthermore, they should design methodologies and assessment procedures to confirm the compatibility of technologies, pedagogy, and teachers' and students' attitudes.

4.2. Implications for university sectors and syllabi developers in higher education

4.2.1. Bottom-up approach

In the bottom-up approach, to validate the connections between the strategic directions, the university sectors collect feedback and pass it on to the policymakers to

assist them in developing and modifying e-learning policies after the integration and evaluation e-learning. Also, this method provides a clear line of evidence regarding what can be achieved. As this approach focuses on the integration of emerging technologies (Turugare & Rudhumbu, 2020), there is a need to adopt effective procedures, which include planning, design, implementation, and evaluation processes. All these can be combined as part of an institutional execution strategy that could lead to a workable and efficient technological application that enhances learner involvement.

4.2.2. Planning stage

First, the plaining step consists of analysing the process to develop a strategic plan. This includes choosing the best technological systems that support, enhance, and optimise the delivery of information, thus reflecting deep understanding and suitability to the users' needs and preferences. University sectors should also analyse the users' needs, instructional expectations, and challenges in using e-learning. This would assist them when adopting and modifying the policies, regulations, and guidelines of NCeL according to the university's mission and vision.

4.2.3. Designing stage

Second, design steps should include pedagogical options such as designing an e-learning environment, interaction delivery, and e-curriculum. The design of the environment should be based on researched learning theories. This would ensure that the virtual environment would largely impact the learning process and also play a crucial role in the acquisition of new knowledge. Hence, the design of the environment should be based on the learning theories. Out of these theories, the dominant in computer assisted language learning (CALL) include interactional, sociocultural, and constructivist theories (Hubbard & Levy, 2016). According to interactional theory, learning takes place via social communication. Interactional theory considers the methods of activation through interpretation as a factor of communication; the establishment of e-learning settings in which candidates participate collaboratively and negotiate the meaning; and the effect of e-curriculums on social and learning communication. Hubbard and Levy (2016) have indicated that any situation in which synchronous or asynchronous communication and interaction takes place can use the interactional theory for assistance, which includes text-chat and voice-chat, either by employing these commination tools separately or in other programmes (e.g., games and virtual tools) or video and web conferencing such as Skype. Furthermore, in advancing sociocultural theory, Vygotsky (1978) stated that learning was a consequence of socially mediated process where the community plays an important function in the procedure of making-meaning. This is essential to develop cognitive process. Several present-day methodologies of e-learning have highlighted the need for cooperative, argumentative, and reflective discussions and activities (Jeong & Hmelo-Silver, 2016). The methodologies also emphasise the significance of dynamic learner involvement and participation in online community situations (Hubbard & Levy, 2016). On the other hand, according to Phillips (1995), constructivist theory

is founded on the assumption that learners construct their knowledge based on the previous learning. He asserted that 'human awareness – be it associations of public awareness called as the different fields, or the reasoning makeups of individual knowers or students – is built' (p. 5). Constructivism is also relevant because it enables a learner to easily adapt to real-life circumstances; by so adapting, he or she will be empowered to counter new challenges by relating them to similar past problems. In CALL field, Healey and Klinghammer (2002) have stressed the importance of the student-centred learning approach where teachers' role should be as facilitators. Also, they have emphasized on the significance of designing authentic activities, which include analysing, collaboration interacting, and critical thinking (assessment of alternative solutions) skills.

Therefore, applying a variety of learning theories in the same context can maximise learning outcomes, deliver effective technological experiences and activate appropriate pedagogies. This can be achieved through creating technology-based environments that provide authentic and meaningful interaction, emphasizing community-based learning that improves social negotiation and various forms of discourse to construct learners' knowledge and problem-solving strategies, emphasizing reflective and critical thinking to transfer previous knowledge into learning and empowering learners with ownership and leadership that prioritizes their competencies.

Additionally, it is vital that the implementation of technology for virtual learning should extend into new dimensions and be redesigned in a way that makes the e-learning environment interactive, attractive, effective, and accessible. It is evident that numerous difficulties arise when students and teachers are glued to the screen all day. The world is now at a juncture, and we need to look to the future to meet its post-lockdown demands. The question now is the following: Should we return to business as usual, or should we look to a path that leads to new ideas and imperatives? Currently, the experience of a stronger focus on online education has can take a place when learning is energetic and interactive. What universities need now is to modify the design quality of the e-learning environment accordingly.

As noted by Richardson et al. (2017), who categorise communicating and collaboration under the social presence factor, interactional relationships between students and teachers are a source of satisfaction for students, and this goes a long way in determining how effective teaching and learning will be. Moore (1989) posits that there are three types of interaction in learning: learner–instructor, learner–learner, and learner–content. By activating these types of interactions, feelings of social connectedness would be emphasised, referring to the close relationship between the teacher, learner, and content; this in itself 'is an emotional experience, evoked by, but independent of, the other's presence' (Rettie, 2003, p. 3). This model not only enhances online teaching and collaborative learning; it also addresses the basic dimensions of presence for students, thereby increasing learners' autonomy to experience deep learning while receiving lectures online. Also, this could extend to SLA theories such as interactional and sociocultural theories where building online learning communities and supporting knowledge co-construction should be emphasized. Hence, without

the presence of these three dimensions in a learning community, there can never be a complete education experience.

The process of designing an online curriculum, which should be considered 'a living document that is in constant flux', has different dimensions to be considered (Alsubaie, 2016, p. 107). Designing process should be the result of cooperation between different parts of a committee. Specifically, university leaders should include students as a part of the development committee. As a result, designing online courses is left to the instructors to determine which materials may need to be approved by the department committees (Al-Jarf, 2007). Such curriculum work needs to be based on a clear understanding of the roles and expectations of the teacher, the students' skills and needs, the mechanisms to enhance dialogue and conversations among the participants in the learning process, and opportunities for them to think and reflect crucially as active agents in the designing process. The development of an online curriculum is a response of effective e-learning environments by using technology to create some form of e-learning experience. This curriculum entails the provision of learning resources, live class sessions, and vital online interactive experiences.

From social and constructivist viewpoints, designing curriculums comprises several vital constituents. These curricula should be academic and authentic, and they should be designed to the context (Hubbard & Levy, 2006; Neville et al., 2005). First, the origination should include authentic, engaging, and challenging academic materials. These contents are imperative because they should be engaging and eloquent to the learners and hence thought-provoking (Ferdig, 2006). The authentic materials enhance the explicit knowledge of a learner by helping them to address their understanding and application of meaningful and new knowledge whereby "learners will reflect on knowledge that they have acquired implicitly' (Ellis, 2009, p. 6). However, the academic contents aid the transfer of the needed tacit skills to the learners in tackling any job-related case or exercise (Neville et al., 2005).

Furthermore, designing self-explanatory content is another solution to some challenges posed by online teaching and learning where learners could interact with e-materials. As teaching is about to be fully digitised, students will have to learn remotely. This implies that students will no longer have full access to their teachers to ask questions or seek clarification one-on-one. Self-explanatory content could broaden a learner's understanding of certain concepts, and it has the tendency to help in the resolution of conflicts encountered when a learner solves a particular problem. For instance, when a student studies a text alongside some examples, the student could acquire more information about the text with the help of his or her prior knowledge (Rittle-Johnson & Loehr, 2017). During a self-explanatory lesson, a learner may encounter a conflict between the newly derived information and his or her prior knowledge. Once a learner discovers this conflict, he or she will be presented with various attempts to resolve it (Rittle-Johnson & Loehr, 2017). The self-explanatory material therefore facilitates a learner's autonomy, knowledge acquisition, and skills transfer, which is a powerful technique that helps learners to monitor understanding, identify missing information, and modify any errors.

Furthermore, an online curriculum needs to be designed in a way that considers the unique needs of each student irrespective of diverse backgrounds and professional experiences. One important thing to consider is that the needs of each student are different. This step is considered essential due to Saudi students' passivity in the learning process. Accordingly, the design of an e-learning curriculum should be adapted to make room for both experienced and inexperienced students in terms of self-regulation skills (Vovides et al., 2007).

To address the variation in the students' respective needs, instructional needs must therefore be personalised, and the course design should be adapted to the needs and attributes of each learner. For example, when an instructor offers the same instructional support to various learners, a learner might still feel incapable of handling the task on his or her own because he or she has lower intrinsic motivation, perceived engagement, and competence (Vovides et al., 2007). An online curriculum that promotes higher autonomy should offer support for those with low autonomy; such a curriculum would be more likely to reflect the needs and desires of the learners, encourage students' initiative, and create a student-centred atmosphere (Vovides et al., 2007).

According to Gupta and Gupta (2020), a good way of creatively implementing technology for an improved e-learning experience is through the personalisation of course content, which allows students not only to study at their own pace but to also study what is right for them. Once course contents are personalised, each student's learning path will be customised, as they will be able to study based on the time and pace that works for them. Gupta and Gupta (2020) claim that a learner's learning path could be customised with the use of machine learning (ML) and artificial intelligence (AI), and they thus suggest the following:

> The third change will be the personalisation of learning. Each student has his/her own pace of studying. While some need more time, others may need more materials to achieve the same outcome. Machine Learning and Artificial Intelligence coupled with strong data analytics can help customise individual learning paths to scale. (Gupta and Gupta, 2020, para. 7)

4.2.4. Implementation stages

Third, once the developmental stage is achieved, the next phase of implementation makes the planning operational. According to Cuesta (2010), three essential conditions make this phase effectual: (a) establishing an earlier training protocol for the practice of both tutors and learners, (b) rapidly evaluating students, and (c) creating all the required situations, such as spaces, equipment, and staff. The implementation phase requires a great amount of participant (facilitator) engagement to manage this project phase (Cuesta, 2010).

4.2.5. Evaluation stage

Fourth, evaluating course learning outcomes is another variable that universities need to pay attention to, which evaluation processes are related to 'cognitive and

emotional variables' (Paechter et al., 2010, p. 224). The first is related to measuring programme outcomes. It is possible that any given programme may have some learning results. The learning outcomes are most frequently evaluated at the learner stage, though they may be combined at the classroom, school, or district stage. It is principally significant to count not just numerical results (e.g., graduation levels and test scores), but also the quality of the learner results (Nusche, 2013). Also, university sectors are required to employ numerous methodologies to measure and value suitable applications of technology resources for learning, interaction, and efficacy. They must also use technology to gather and review data, deduce results, and convey the significance of investigations for the advancement of instructional practice and student learning. Furthermore, they should assess the staff's technological knowledge and skills to accelerate quality professional advancement and report decisions. E-learning has a significant influence on tutors, professors, and educational methodologies (Nusche, 2013).

For the latter, emotional results are associated with aspects such as learner motivation, academic involvement, and upcoming targets. Moreover, the practices of universities must be upheld by promoting online meeting procedures and social relations, thereby allowing learners to remain connected with their peers and pals. It is therefore imperative for evaluators to recognise and operate in cooperation with stakeholders in higher education to reveal their needs for both formative and summative data (Mandinach, 2005).

4.3. Inside-out strategy

The inside-out strategy focuses on improving the lectures' and students' digital literacy and attitudes. First, the professional development of teaching staff is an important element in the inside-out strategy. Old teaching approaches should be replaced with new pedagogical approaches to suit the demands of virtual education. Since we cannot achieve new results with old methods, university education sectors should facilitate an overhaul of the techniques and strategies used by teachers to impart knowledge to students. Hence, teachers need to be trained as pedagogical instructors, and they may also require adequate technical training and assistance in the creation and modification of digital contents, educational technology, and skills of content management system (Stickney et al., 2019). Arming teachers with teaching approaches that are aligned with the most recent technology in their course contents and assessments will lead to more positive results and increase their self-efficacy and perception toward using learning technologies (Meiers, 2007).

Second, increasing students' attitude can be achieved through "social interactions and fostering students' ability to control their learning" (Zhu et al., 2020, p. 1504). Therefore, universities must prioritise students' wellbeing. At the same time, Richardson et al. (2017) and Tu and McIsaac (2002) have explained that social presence is a strong predictor of satisfaction within a computer-mediated communication environment. During online teaching, universities need to design similar practices to those

they would use on a normal, pre-pandemic lecture day. Close relationships between students and their teachers must be maintained. Furthermore, the rituals of universities should be preserved by fostering virtual meeting formalities and social interactions and enabling students to stay in contact with their friends and peers. Students must be taught basic positive and practical steps to support their mental health and be given some sense of control to mitigate the risk of disconnectedness and reduce their anxiety.

Further, educational establishments encounter considerable challenges in training learners with the abilities and education needed to adjust to the current technological advancements of the 21st century. One of 21st-century skills, especially for Saudi students who have a passive role in the learning process, is the application of digital literacy skills such as self-regulation and self-evaluation, which prepares them to be responsible for their own learning. These skills can be activated by tracking metacognitive skills, which include goal setting, task orientation, reflection, planning, managing, evaluation of outcomes, and monitoring digital recourses. According to Vovides et al. (2017), students who use e-learning technology should know how to 'select, combine, coordinate their cognitive strategies in connection to the new knowledge, and prompted to reflect on their strategy use, extending their metacognitive knowledge with strategy and capacity beliefs' (p. 68). Furthermore, the interpersonal skills such interacting, communicating, working with classmates and teachers should be emphasized. Therefore, university sectors and teachers should facilitate the identification of students' learning styles and needs, task planning, use of appropriate skills and steps to solve problems, and evaluation of task success.

5. Conclusion

In conclusion, the question now is the following: Will there be a return to the act of sitting passively in classes while teachers lecture from the front? As an essential resource for the future, education needs greater investment and the intergrading of technology in a practical way. More attention should be paid to e-learning curricula, and teachers should be trained on how to digitise their instruction while emphasising e-learning pedagogical approaches and strategies. The investment in education should not focus only on the academic element, as students' emotional and psychological states should also be taken more seriously. In addition, global issues such as the pandemic can bring the whole world together and provide an opportunity for us to collaborate and learn from one another to lessen the impacts on education systems. Managing this kind of situation requires the collective efforts of all actors across education system.

Competing interests

No potential competing interest was reported by the author.

References

Al-Gamdi, A., & Samarji, A. (2016). Perceived barriers towards e-learning by faculty members at a recently established university in Saudi Arabia. *International Journal of Information and Education Technology*, *6*(1), 23-28.

Al-Jarf, R. (2007). *Eintegration challenges for rectors & deans in higher education institutions in Saudi Arabia* [paper presentation]. The Proceedings of the 10th IASTED International Conference on Computers and Advanced Technology in Education, China.

Al-Jarf, R. (2020). Distance learning and undergraduate Saudi students' agency during the COVID-19 pandemic. *Bulletin of the Transilvania University of Braşov, Series IV: Philology & Cultural Studies*, *13*(2), 37-54.

Al-Fadhel, H., Al-Jalahma, A., & Al-Muhanadi, M. (2020, December). *The Reporting of Technological Readiness of Higher Education Institutions in GCC Countries: A Situational Analysis of COVID-19 Crisis* [paper presentation]. 2020 Sixth International Conference on e-Learning, Bahrain.

Al-Taweel, D., Al-Haqan, A., Bajis, D., Al-Bader, J., Al-Taweel, M., Al-Awadhi, A., & Al-Awadhi, F. (2020). Multidisciplinary academic perspectives during the COVID-19 pandemic. *The International Journal of Health Planning and Management*, *35*(6), 1295-1301.

Albugami, S., & Ahmed, V. (2015). Success factors for ICT implementation in Saudi secondary schools: From the perspective of ICT directors, head teachers, teachers and students. *International Journal of Education and Development using Information and Communication Technology (IJEDICT)*, *11*(1), 36-54.

Alebaikan, A. (2010). *Perceptions of blended learning in Saudi universities* (PhD thesis). University of Exeter, United Kingdom.

Alebaikan, R., & Troudi, S. (2010). Blended learning in Saudi universities: challenges and perspectives. *Research in Learning Technology*, *18*(1), 49-59.

Alhouti, I. (2020). Education during the pandemic: the case of Kuwait. *Journal of Professional Capital and Community*, *5*(3), 213-225.

Aljohani, N. (2019). *An investigation of the integration of synchronous online tools to deliver task-based language teaching: the example of SpeakApps* (PhD thesis). The University of Queensland, Australia.

Almaiah, A., Al-Khasawneh, A., & Althunibat, A. (2020). Exploring the critical challenges and factors influencing the E-learning system usage during COVID-19 pandemic. *Education and Information Technologies*, *25*, 5261-5280.

Alshahrani, S., & Ward, R. (2014, February). *Shifting from traditional approaches of teaching to a blended learning approach; challenges and possible solutions* [paper presentation]. The 7th Saudi Students Conference-UK, United Kingdom.

Alsubaie, A. (2016). Curriculum development: Teacher involvement in curriculum development. *Journal of Education and Practice*, *7*(9), 106-107.

Alqurshi, A. (2020). Investigating the impact of COVID-19 lockdown on pharmaceutical education in Saudi Arabia-A call for a remote teaching contingency strategy. *Saudi Pharmaceutical Journal*, *28*(9), 1075-1083.

Alturise, F. (2020). Difficulties in teaching online with blackboard learn effects of the COVID-19 pandemic in the western branch colleges of Qassim University. *International Journal of Advanced Computer Science and Applications*, *11*(5), 74-81.

Ayotola, A., & Abiodun, S. (2010). Computer animation and the academic achievement of Nigerian senior secondary school students in biology. *Journal of the Research Center for Education Technology (RCET)*, *6*(2), 148-161.

Bitner, N., & Bitner, J. (2002). Integrating technology into the classroom: Eight keys to success. *Journal of Technology and Teacher Education*, *10*(1), 95-100.

Braman, S. (2011). Defining information policy. *Journal of Information Policy*, *1*, 1-5.

Cuesta, L. (2010). The design and development of online course materials: Some features and recommendations. *Profile Issues in Teachers Professional Development*, *12*(1), 181-201.

Ebaid, S. (2020). Accounting students' perceptions on e-learning during the covid-19 pandemic: Preliminary evidence from Saudi Arabia. *Journal of Management and Business Education*, *3*(3), 236-249.

Ellis, R. (2009). Implicit and explicit learning, knowledge and instruction, *Implicit and Explicit Knowledge in Second Language Learning, Testing and Teaching*, *42*(4), 3-25.

Erdoğan, S., Durmuş, Ç, Y., & Gedikli, A. (2020). Relationship between oil revenues and education in Gulf Cooperation Council countries. *International Journal of Energy Economics and Policy*, *10*(1), 193-201.

Ferdig, E. (2006). Assessing technologies for teaching and learning: understanding the importance of technological pedagogical content knowledge. *British journal of educational technology*, *37*(5), 749-760.

Gaytan, J., & McEwen, C. (2007). Effective online instructional and assessment strategies. *The American Journal of Distance Education*, *21*(3), 117-132.

Gupta, A., & Gupta, V. (2020, September 25). Reshaping Learning. *The Hindu*. https://www.google.com/amp/s/www.thehindu.com/education/how-the-pandemic-has-changed-some-elements-of-teaching-learning-permanently/article32694224.ece/amp/. Accessed 20 October 2020.

Healey, D., & Klinghammer, J. (2002). Constructing meaning with computers. *TESOL Journal*, *11*(3), 3-4.

Hubbard, P., & Levy, M. (2016). Theory in computer-assisted language learning research and practice. In F. Farr & L. Murray (Eds.), *The Routledge handbook of language learning and technology*. London: Routledge.

Hubbard, P., & Levy, M. (Eds.). (2006). *Teacher education in CALL* (Vol. 14). Amsterdam: John Benjamins Publishing.

Hussein, E., Daoud, S., Alrabaiah, H., & Badawi, R. (2020). Exploring undergraduate students' attitudes towards emergency online learning during COVID-19: A case from the UAE. *Children and Youth Services Review*, *119*, 105699.

Jeong, H., & Hmelo-Silver, E. (2016). Seven affordances of computer-supported collaborative learning: How to support collaborative learning? How can technologies help? *Educational Psychologist*, *51*(2), 247-265.

Investsaudi. (2018). Invest Saudi. https://investsaudi.sa/media/1782/education-training.pdf. Accessed 1 January 2020.

Kingdom of Saudi Arabia. *Saudi Arabia's vision for 2030*. (2018). http://vision2030.gov.sa. Accessed 16 October 2020.

Khalil, R., Mansour, E., Fadda, A., Almisnid, K., Aldamegh, M., Al-Nafeesah, A., & Al-Wutayd, O. (2020). The sudden transition to synchronized online learning during the COVID-19 pandemic in Saudi Arabia: a qualitative study exploring medical students' perspectives. *BMC Medical Education*, *20*(1), 1-10.

Liedtka, J. (2000). Strategic planning as a contributor to strategic change: a generative model. *European Management Journal*, *18*(2), 195-206.

Mandinach, B. (2005). The development of effective evaluation methods for e-learning: A concept paper and action plan. *Teachers College Record*, *107*(8), 1814-1835.

Meiers, M. (2007). Teacher Professional Learning, Teaching Practice and Student Learning Outcomes: Important Issues. In T. Townsend & R. Bates (Eds.), *Handbook of Teacher Education: Globalization, Standards and Professionalism in Times of Change* Netherlands: Springer, pp. 409-414.

Ministry of Education (Saudi Arabia) (2017). Education and vision 2030. https://www.moe.gov.sa/en/Pages/vision2030.aspx. Accessed 19 August 2020.

Ministry of Education (2020). Royal Approval Issued to Reopen Admission to E-Learning, Distance Education Programs, in 5 Universities. https://www.moe.gov.sa/ar/mediacenter/MOEnews/Pages/NY1442-322.aspx. Accessed 8 February 2021.

Moore, M. (1989). Editorial: Three types of interaction. *The American Journal of Distance Education*, *3*(2), 1-6.

Naar, I. (2020, March 8). Saudi Arabia suspends all schools until further notice amid coronavirus concerns. *Alarabiya*. https://english.alarabiya.net/en/News/gulf/2020/03/08/Coronavirus-Saudi-Arabia-suspends-all-schools-universities-until-further-notice. Accessed 20 October 2020.

Neville, K., Heavin, C., & Walsh, E. (2005). A case in customizing e-learning. *Journal of Information Technology*, *20*(2), 117-129.

Nusche, R. (2013). Student assessment: Putting the learner at the centre. Synergies for Better Learning:

An International Perspective on Evaluation. *Reviews of Evaluation and Assessment in Education and Assessment.* Paris: OECD Publishing.

Paechter, M., Maier, B., & Macher, D. (2010). Students' expectations of, and experiences in e-learning: Their relation to learning achievements and course satisfaction. *Computers & Education*, *54*(1), 222-229.

Phillips, C. (1995). 'The good, the bad, and the ugly: The many faces of constructivism'. *Educational Researcher*, *24*(7), 5-12.

Quadri, N., Muhammed, A., Sanober, S., Qureshi, N., & Shah, A. (2017). Barriers effecting *(sic)* successful implementation of e-learning in Saudi Arabian universities. *International Journal of Emerging Technologies in Learning*, *12*(6), 94-107.

Reimers, F. M., & Schleicher, A. (2020). *A framework to guide an education response to the COVID-19 Pandemic of 2020*. OECD. https://www.hm.ee/sites/default/files/framework_guide_v1_002_harward.pdf. Accessed 19 August 2020.

Rettie, R. (2003, October 6–8). *Connectedness, awareness, and social presence* [paper presentation]. The 6th International Presence Workshop, Denmark.

Richardson, C., Maeda, Y., Lv, J., & Caskurlu, S. (2017). Social presence in relation to students' satisfaction and learning in the online environment: A meta-analysis. *Computers in Human Behavior*, *71*, 402-417.

Rittle-Johnson, B., & Loehr, M. (2017). Eliciting explanations: Constraints on when self-explanation aids learning. *Psychonomic Bulletin & Review*, *24*(5), 1501-1510.

Stickney, T., Bento, F., Aggarwal, A., & Adlakha, V. (2019). Online higher education: Faculty satisfaction and its antecedents. *Journal of Management Education*, *43*(5), 509-542.

Tu, H., & McIsaac, M. (2002). The relationship of social presence and interaction in online classes. *The American journal of distance education*, *16*(3), 131-150.

Turugare, M., & Rudhumbu, N. (2020). Integrating technology in teaching and learning in universities in Lesotho: opportunities and challenges. *Education and Information Technologies*, *25*, 3593-3612.

Technology Standards for School Administrators Collaborative. (2001). Technology standards for school administrators (TSSA). https://www.russell.k12.ky.us/userfiles/indexblue/admin_techstandards.pdf. Accessed 1 January 2021.

Vovides, Y., Sanchez-Alonso, S., Mitropoulou, V., & Nickmans, G. (2007). The use of e-learning course management systems to support learning strategies and to improve self-regulated learning. *Educational Research Review*, *2*(1), 64-74.

Vygotsky, S. (1978). Socio-cultural theory. *Mind in Society*, *6*, 52-58.

World Health Organization. (2020). Critical preparedness, readiness and response actions for COVID-19. https://www.who.int/emergencies/diseases/novel-coronavirus-2019/technicalguidance/critical-preparedness-readiness-and-response-actions-forcovid-19. Accessed 19 September 2020.

Zhu, Y., Zhang, J., Au, W., & Yates, G. (2020). University students' online learning attitudes and continuous intention to undertake online courses: a self-regulated learning perspective. *Educational Technology Research and Development*, *68*, 1485-1519.