How Covid-19 Reshaped the Views of the University Instructors on Technology Integration

Emsal Ates Ozdemir[*] iD
American University of the Middle East, KUWAIT

Sercan Saglam iD
American University of the Middle East, KUWAIT

Sarp Erkir iD
American University of the Middle East, KUWAIT

Abstract: The aim of this exploratory case study is to investigate the impact of the pandemic as an unexpected situational variable on university instructors' perceptions and attitudes towards technology integration, as well as their foresight about the future of education in post Covid-19 era. The data for the study came from autobiographies, narratives, and opinionnaires. The findings revealed that the degree of familiarity with educational technology and eagerness to integrate technology into education made a difference in academicians' adaptation to the new mode of delivery. As for their predictions for the future, an increase in the use of educational technology not only in teaching, but also in testing and assessment is expected. Participants also emphasized a need to enhance the infrastructure to avoid any further technical issues and offer continuous development opportunities for teachers and students to become familiar with new technologies.

Introduction

Although the fast pace of technological developments in digital education with the turn of the 21st century has led to a widespread endorsement of blended, hybrid, and fully online instruction (Stevens et al., 2021), it was the Covid-19 pandemic period that has remarkably accelerated the process and broadened the use of online teaching and learning technologies in education. During this period, more and more professionals teaching at different levels of education experienced teaching in different modes of delivery.

Before the pandemic, face-to-face was the main mode of delivery for instruction at most higher education institutions. As Singh et al. (2021) stated, compared to blended/hybrid and online instruction, face-to-face interaction provides many advantages for students and teachers as it is the basis upon which real-time physical interaction is viable between teachers and students, and between students themselves. The facts that in-person learning helps build a sense of community (Singh et al., 2021) and that it allows the teachers to observe non-verbal cues (Kemp & Grieve, 2014) are some of the advantages offered by face-to-face instruction.

Although face-to-face teaching was the common practice for most of teachers and students, there was still a need for other modes of delivery in different contexts. According to the University at Buffalo Office of Curriculum, Assessment and Teaching Transformation (n.d.) these modes are named as online/synchronous, online/asynchronous, hybrid, blended synchronous, and hybrid flexible. Researchers have advocated the use of different modes of delivery citing various advantages.

Beishuizen (2008), and Hass and Joseph (2018), for instance, pointed out greater access and cost-effectiveness as key features of the online mode. A plethora of past studies has also pointed to the benefits of online teaching and learning: saving cost (Soon et al., 2000), fostering self-regulated learning (You & Kang, 2014), an opportunity for repeated access to learning activities at one`s own pace, peer interaction (Vanslambrouck et al., 2018), and an opportunity for becoming innovative by using computer technology (Bali & Liu, 2018).

As for hybrid and blended courses, the integration of technology allows sharing of content for the teachers as well as offering alternative study and review options for students. In hybrid courses, face-to-face mode is still the dominant mode

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[*] **Corresponding author:**
Emsal Ates Ozdemir, American University of the Middle East, Kuwait. ✉ emsal.Ates@aum.edu.kw

of delivery and the synchronous or asynchronous modes of interaction boost learning outside the classroom (Ateş Özdemir, 2013). In an extensive review of studies on hybrid courses, Raes et al. (2020) summarized the benefits of hybrid courses under organizational and pedagogical benefits. Organizational benefits mainly derive from the general advantage of hybrid mode over face-to-face mode with reference to flexibility and ease of access, as well as fairer use of physical and human resources. As for the pedagogical benefits of hybrid mode, Raes et al. (2020) underpinned the following:

> Ensure access to education regardless of place, ... thus providing more-inclusive education and equality in learning outcomes"; "guarantee continuity of instruction and promote student retention"; "give students a better sense of control over their learning"; and "prepare them for careers in our technology-rich society. (pp. 281-282)

All three modes of delivery have their own advantages and drawbacks, and the mode of delivery in due course depends on teaching approaches, situational factors, students' preferred mode of instruction, needs and interests, as well as institutional or instructional policies as also emphasized by the University at Buffalo Office of Curriculum, Assessment and Teaching Transformation (n.d.). However, the Covid-19 period led to an obligatory shift in teaching practices affecting institutional decisions and policies when the pandemic was declared as a world-wide health crisis by the World Health Organization in 2020 (World Health Organization, 2020). United Nations International Children's Emergency Fund (2020) referred to this period as an 'educational crisis' in their press release on 20 April 2020 and called for global collaboration to act together to overcome some of the possible negative impacts of this period. Different mediums or forms of education such as fully online learning, blended learning, flipped learning or hybrid learning were still at the institutional level and were based on voluntary integration or experimentation of these institutions (Dhawan, 2020). There were no global, regional, or local policies to moderate learning. However, during this period, most schools around the globe were closed and were forced to shift to one of the online learning modes to be able to continue delivering education to students (Toquero, 2020). This unforeseen change also forced many practitioners to experience different modes of delivery, regardless of their preferred and familiar mode of delivery as well as their general perceptions and familiarity with these modes of instruction (Celik et al., 2022; Mohamad et al., 2023; Oumar et al., 2021). Previous studies investigating Covid-19 process took a descriptive perspective and aimed to underpin the challenges, problems, threats, and opportunities caused by Covid-19 pandemic (e.g., Akram et al., 2021; Ali & Mohammadzadeh, 2022; Khong et al., 2023; Su, 2023; Wang, 2022). These studies investigated educators' technology integration relying on two useful theoretical orientations of Technological Pedagogical Content Knowledge (TPACK) framework and the Technology Acceptance Model. These studies did not only help educators around the world understand how challenging this period was for everyone, but also taught each other as most of them focused on best practices, evaluating the impact of this period critically. In this study, our aim is to go a step further and explore the impact of pandemic as a catalyst for change. In other words, this research deals with the aftermath of the pandemic. Pandemic in this study is not seen as an end, but more as an initiator for change, possibly reshaping not only the teaching practices of the university instructors, but also their cognition as teachers. Therefore, this research aims to reveal not only the challenges, threats, and opportunities the academicians experienced due to the changes in educational practices brought about by the pandemic, but also to explore whether this process led to a change in teachers' existing and future teaching practices. This is why teachers' vision for the future of education in post-pandemic era is highly relevant and essential for the study. Exploring the vision of university instructors for the future of education from a perspective of technology integration can provide insightful information about how the pandemic reshaped instructor's cognition of education in general and technology's role on education in specific. As such, this study aims to find out the answers to the research questions below:

1. What were the perceptions and practices of academicians about ICT integration in education before, during and after the Covid-19 pandemic period?
2. How has Covid-19 pandemic period with online teaching affected university instructors?
3. What do academicians think about the future of education after Covid-19 pandemic?

Literature Review

Educational institutions around the world have employed some form of online learning because of the need for physical distancing at the time of the Covid-19 pandemic. Various studies focused on this period to investigate what teachers have gone through. This sudden shift in the medium of instruction naturally brought new challenges as well as opportunities for educators around the world (Daniel, 2020). The academic literature on the teachers' and instructors' views on the use of educational technology during Covid-19 has revealed the emergence of several contrasting themes. On one side of the pendulum were those studies which found that Covid-19 was an opportunity for growth, despite all the challenges it also caused. For example, Merisi and Pillay (2020) found out that academicians were aware of the challenges brought about by the pandemic and the imperative to teach differently. They learned new teaching methods; became more caring academicians, and worked differently. In another study, Ghanbari and Nowroozi (2022) discussed that teachers initially faced pedagogical, technological (Razkane et al., 2022), institutional, and emotional challenges because of the shift to online instruction; however, as the course progressed, they were able to find solutions to deal with the new situation. Similarly, Alfaleh (2022) who explored 12 Saudi teachers' experiences during the pandemic, found that the pandemic was challenging for all teachers as it affected their common practices and forced them to work in an environment that they were comfortable with; however, it also led to changes in teaching practices as seven teachers "wanted to adopt the

teaching aspects they thought were beneficial for their students when engaging in online learning" (p. 52). Similarly, Mohamad et al., (2023) investigating English language teachers (ELT) practices during this period, found that this process brought challenges in technological skills and assessment for the English language teachers, and they indicated that the teachers overcame these problems by receiving assistance from their colleagues, enrolling in courses, training, and webinars, and selecting appropriate online learning platforms and improving online assessments. To sum up, Covid-19 period was challenging, yet also brought about many opportunities for educators to develop themselves and reshape their beliefs, attitudes, and practices in technology integration.

On the other side, there were also studies which revealed that the process was merely a source of stress, anxiety, and burn-out (Sokal et al., 2020; Wakui et al., 2021) because the teachers were unprepared and untrained (Juárez-Díaz & Perales, 2021). In one study, A. Thomas et al. (2022) found that the teachers believed their work would be exceeding the standards with enhanced information technology. The teachers also faced network problems and felt demoralized by lack of interaction (A. Thomas et al., 2022). From a similar perspective, Celik et al. (2022) also reported that face to face education is more efficient for the academic development of the student than the online education model as the course is not interrupted due to connection problems; the measurement and evaluation is reliable in and out of the classroom.

These mixed results are reasonable because the education employed during this period was affected not only by human agents, like the instructors or the students, but also by contextual and institutional factors. Most of the schools and universities started to offer online or hybrid education which was described later as Emergent Remote Teaching and Learning (ERTL). Therefore, this rapid and unexpected shift in the mode of delivery might have created challenges and problems, but also positive outcomes for educators and students alike. Previous research as summarized above highlighted the challenges experienced. This period might have been stressful for instructors; however, as also found in the study of Alfaleh (2022), it may have also triggered change and made a difference in teachers' cognition and behaviour. Explanatory studies conducted during the Covid-19 period shed light on the challenges and instructors' strategies to cope with them during ERTL, yet they also fell short of explaining whether instructors' practices or cognition changed or not. It is now apparent from existing research that ERTL affected and challenged all teachers in some way or another; however, taking a proactive and opportunistic perspective, it is not unrealistic to expect a change in instructors as well. That is why it is worthwhile to explore the Covid-19 period as a catalyst of change and investigate its impact on instructors' cognition of technology integration.

Emergency Remote Teaching and Learning (ERTL)

Although the mode of delivery was fully remote, which resembles online teaching and learning, ERTL is considered different, as the pedagogy and the sudden shift to online teaching was not a voluntary decision, but rather a "temporary shift of instructional delivery to an alternate delivery mode due to crisis circumstances" (Hodges et al., 2020, para. 14). This new mode of delivery required extensive use of technology, and technology integration in education is dependent on many factors, including teachers' willingness and preparedness. However, this time teachers' knowledge, beliefs, and thoughts, which make up the teacher cognition, were not factored in and teachers found themselves in the middle of the process. Research has supported the claim that EFL teachers' cognition can be very influential in shaping their instructional practices, thereby affecting the learning outcomes of students (Kang & Cheng, 2014; Mohammadi & Moradi, 2017). Nonetheless, as also emphasized by Lam and Kember (2006), conceptions and approaches to teaching are vital in shaping teacher behaviour. Studies on approaches to using educational technology in teaching and learning showed that conceptions and approaches to teaching are reinforced by conceptions of technology use in education, conceptions of teaching and learning, and perceptions of the technological teaching context (Englund et al., 2017). Previous research on teacher cognition and technology integration has shown that teachers who have traditional beliefs tend to make more teacher-centred use of technology, and do not believe in the need to integrate technology; whereas teachers with constructivist beliefs use technology to make their teaching more student-centred, interactive or innovative (Ertmer, 2005; Taimalu & Luik, 2019). Therefore, it is essential to understand teacher cognition, which not only influences teaching practices, but also helps understand the cognitive processes that affect them.

Teacher Cognition

Teacher cognition has gained importance after the discovery that instructional practice and teacher behaviour in the classroom are influenced by teacher's belief system, routine practices and habits (Borg, 2003). According to Borg (1997, as cited in Borg, 2003), teaching is a result of complex interrelated variables affected heavily by teacher cognition which is shaped and is being shaped by schooling, professional coursework, contextual factors, and classroom practice. With the breakout of the pandemic, teachers were forced to reconsider their beliefs about teaching and make changes in their practices to adapt to the changing requirements of the new educational context. Not all teachers were ready for the transition as ERTL emerged not by choice, but out of necessity. In the traditional way of teaching, teachers' integration of technology was limited to technological teaching aids such as smart boards, Web 2.0 tools, presentations and audio/video streaming tools. In this regard, the integration of online teaching and learning technologies was seen to some extent as an optional tool for addressing different learning needs and styles and motivating the new generation of learners (Hanafi et al., 2017). Therefore, teachers' technological competence as well as their beliefs and practices regarding technology

integration was not a hindranc*e*, but a motivating factor to make education more engaging and interactive. ERTL forced the teachers to move away from their comfort zone of teaching and to endorse this new unpredicted way of teaching (Hodges et al., 2020).

Technology Acceptance Model (TAM)

Technology integration and the extent to which teachers make use of technology depends not only on their general beliefs and practices about the education, but also on the value the teachers attach to technology and technology integration. Some teachers naturally are keener on using technology, whereas others tend to avoid using it because of various factors, such as the lack of relevant knowledge, low self-efficacy, and existing belief systems (Ertmer, 2005; Lawless & Pellegrino, 2007; Li & Huang, 2017; Mueller et al., 2008; Subramaniam, 2007).

Technology Acceptance Model (TAM) is a theory developed by Davis (1989) and Bagozzi et al. (1992) and is used to determine the user`s attitude toward technology use through two beliefs which are called Perceived Usefulness (PU) and Perceived Ease of Use (PEOU). These beliefs are the two variables and other factors are categorized as external factors. Marikyan and Papagiannidis (2022) state that the primary objective of this model was to shed light on the processes underpinning the acceptance of technology, to predict the behaviour of the university lecturers, and provide a theoretical explanation for the successful implementation of technology.

TAM has been an important model that explains how instructors may make use of technology in their classroom. For that reason, during Covid-19 some studies combined this model with TPACK (e.g., Akram et al., 2021; Ali & Mohammadzadeh, 2022; Khong et al., 2023; Su, 2023; Wang, 2022). They explained that this period was challenging, but also informative equipping instructors and students with many new skills.

Although TAM has been criticised for disregarding other debilitating factors affecting technology integration, it is still considered a valid model in terms of researching teacher's technology integration (Li & Huang, 2017). It may give invaluable insights into the current and future teaching practices of the practitioners involved. In the Covid-19 context of this study, the university lecturers were not given the option to adopt these technologies. They could not evaluate the options they were offered in terms of PU and PEOU during Covid-19 period in most parts of the world. Therefore, the data collected in this study will shed some light on the existing and future decisions of the university lecturers in terms of technology integration.

In the post-pandemic era, it is highly likely that teachers and university lecturers will go back to the routines and habitual way of teaching; however, in terms of teachers' perceptions and practices, there might be a change. Therefore, understanding how these rapid changes may potentially affect the future of integrating educational technologies is still very important. Teaching professionals are the primary source of contact as "they also bear primary responsibility for curriculum development and implementation. They possess insights into student perceptions, making their views valuable in assessing how well universities are adapting to teaching during the Covid-19 pandemic and how this can be enhanced" (Hickling et al., 2021, p. 95) and therefore, it stands to reason that there is a need to investigate teaching academics.

Methodology

This qualitative study explores the impact of the pandemic as an unexpected situational variable on university instructors` perceptions, beliefs, and attitudes towards technology integration, as well as exploring their foresight about the future of education in post Covid-19 era. The study was conducted with four university instructors with similar teaching experiences and the data was collected through the autobiographies of the participants, their narratives, and opinionnaires.

Research Design

This study follows the case study methodology as the research design. According to Yin (2009, p.2), there are three criteria that must be met in order to call a study a case study. Firstly, the purpose must be to answer "how", "what" or "why" questions. Secondly, researchers must have little control over events, and finally, the focus of the research must be on a contemporary phenomenon within a real-life context. The research questions posed for the study all try to explore the "how" and "what" questions. As for the description of the phenomenon, the pandemic has had a remarkable impact on everyone's daily and professional life and the changes that need to be made during the pandemic were unforeseen. In the field of education, the preventive measures to limit social interactions naturally promoted different forms of delivery in which technology integration became more than ever necessary. Hence, technology and its integration into education became more prevalent in this process, affecting practitioners' professional life, as well as their practices, cognition, and attitudes. During the pandemic, most practitioners in the field of education have taught in one or more forms of online education. In that sense, education during the pandemic can be seen as a contemporary phenomenon within a real-life context. Considering the criteria proposed by Yin (2009, p.2), this research can be named as an exploratory case study.

Sample

The study was conducted with four university instructors working in a large public university in Turkiye. They all taught English to university students at a preparatory school and had more than 15 years of teaching experience and hence can be considered "senior instructors of English". Participant 1 and Participant 3 had similar teaching experiences, 18 and 19 years respectively. Participant 2 and Participant 3 graduated in 1999 and had 23 years of teaching experience at the time of the study.

The participants varied with reference to their foundational university training and the levels of post-graduate degrees earned. Three of the participants were graduates of English Language Teaching Department and one earned his Bachelor's degree in American Culture and Literature. Participant 1 did not attend any post-graduate studies. Participants 2 and 4 earned a Master's degree in teaching English as a Foreign Language and pursued their doctorate studies in Curriculum and Instructional Design. Participant 3 also earned a Master's degree in Teaching English as a Foreign Language; however, he did not attend any doctorate program.

All participants have extensive experience in curriculum design, testing and instructional design and served in administrative roles throughout their career. Besides, throughout their teaching career, the university provided cutting-edge technology for its faculty for technology integration. Before collecting the necessary data from the participants, A consent letter from each of the participants to attend the research study was taken.

The data set for the study came from narratives, autobiographies and opinionnaires of 4 university lecturers. Chazarniawaska (2004, p.17, as cited in Creswell et al., 2007) defines narrative as "a spoken or written text giving an account of an event/action or series of events/actions, chronologically connected". Through narrative inquiry, it is possible for the researcher to collect the life experience of the participants in their stories. Clandinin and Connely (2000, as cited in Creswell et al., 2007) call these stories as field texts and these texts formed the raw data for the researchers of this study. Participants were asked to narrate their integration of technology in their classes before and during the pandemic. The prompt given was: 'Write about how you prepared / delivered a lesson on a typical day before / during / after Covid-19 pandemic focusing on how you integrated technology into your lessons.' A comparison of these narratives was utilized to account for the changes in technology integration. "Narratives do not speak for themselves or have unanalysed merit; they require interpretation when used as data in social research" (Jupp, 2006, p. 186).

The participants also wrote their autobiographies.

> In autobiographical writing, the participants will start with writing a description of the key issues and develop further into reflective thinking, generating new insights and heightening the participants' sensitivities towards those issues. Hence, this enables the author to see his/her research in the context of his/her biography and culture. (Taylor & Settlemaier, 2003, p. 233)

Autobiographies were utilized to address teacher cognition about technology integration in education. They consisted of six questions focusing on participants' teaching philosophy, as well as perceptions and practices regarding technology integration in education with a special focus on the pandemic as an external variable that may lead to a change in teacher cognition. The questions posed for the participants to guide their autobiographies are as follows:

1. What is your philosophy of teaching and how do you see your role in the process of teaching and learning in and out of the classroom?

2. How do you see the role of technology in education?

3. Describe your experience and training in technology integration in education.

4. Describe your experience with teaching / learning in different modes of delivery (Face-to-Face, Hybrid, Online).

5. How competent do you feel about integrating technology into your English classes before and after the Covid-19 pandemic?

6. How do you envision education after the pandemic?

The data from narratives and autobiographies were further supported by an opinionnaire (a questionnaire designed to elicit views on matters from which generalizations may be abstracted). The idea of designing an opinionnaire arose from a need to ask follow-up questions to the participants to get precise opinions and to avoid general findings. First, semi-structured interviews were considered as the relevant data collection tool. However, considering the fact that the participants would need time to think over the questions, an opinionnaire was believed to yield better results and increase the reliability of the data, as time constraints may be a debilitating factor when getting participants' opinions, especially when they have to respond immediately to an open-ended question that needs some time to mentally organize ideas. That is why an opinionnaire was employed rather than a semi-structured interview. It was developed by the researchers and was sent to five field experts along with narratives and autobiographies for content validity. The

feedback from the experts led to minor changes in data collection tools, mainly focusing on the language to clarify the items on the data collection tools. After the feedback from the experts, all data collection was finalized.

In the opinionnaires, participants were asked to elaborate on the future of education, as well as reflect on their own teaching during the pandemic process. The opinionnaire consisted of six open-ended questions focusing on the data from the autobiographies and the narratives. The open-ended questions posed in the opinionnaire are as follows:

1. Do you think technology helps to learn or just helps with being a tool for emergency situations?
2. Did you do anything extra to develop your skills related to technology integration during your remote teaching period?
3. Which online teaching and learning platforms were you already familiar with? Which ones did you get to know during your remote teaching period?
4. What were the challenges you faced while teaching remotely?
5. Do you think you will continue using educational technology in your classes in the future?

Analyzing of Data

Thematic analysis was conducted on the collected data. Jupp (2006) states, "The thematic approach is useful for theorizing across several cases-finding common thematic elements across research participants and the events they report" (p.187). As for the procedure, all three researchers looked at the raw data independently and created conceptual groupings (i.e., themes). Once the themes were identified independently, all researchers came together and discussed these as a group for discrepancies in themes. As also emphasized by J. Thomas and Harden (2008), a group discussion is a way to identify the overlaps/ divergences and increase the reliability of the data analysis. Rather than conducting inter-rater reliability calculations, the researchers as a team negotiated on themes by discussing the divergences and whether they should be included in the analysis or not. The themes all researchers agreed on along with a few new themes that arouse from the discussion of the divergent ones were determined as the final set of themes. As a further measure to increase the validity of the data analysis, the ideas derived from the thematic analysis were sent back to participants to get their approval.

Findings/Results

The results of the study are presented in the order of the research questions. First, the participants' cognition on technology integration is portrayed. Second, the perceived effects of a new mode of delivery by participants are presented and finally, the participants' foresight as to the future of education is shared. Responses were analysed through thematic analysis and the emerging themes are categorized.

Participants' Beliefs, Perceptions, and Practices Before, During, and After Covid-19 Pandemic on Technology Integration in Education

Before the pandemic, the preparation for technology integration was up to the teachers as one of the participants also pointed out. Working at a university where there are technological facilities and infrastructure, the majority of the participants had been using technology in their classes. However, as this was dependent on their personal preferences, some of them used technology to support their teaching. Some used it as an indispensable part of their teaching before Covid-19 pandemic.

Participant 1 and Participant 4 indicated that they always used contemporary technology in their classrooms since they started teaching. As the most technological devices at those times were OHP and audio cassettes, they had used these tools to prepare and share materials for teaching. Participant 1 used projectors, LMS technologies for language courses, and e-portfolios. Participant 4 shared that he had always been into educational technology and always followed the new learning technologies and tried to learn about them with his own effort. He also got some special training on technology integration in education. He was already teaching online or blended lessons and continues to do so. He made use of flipped learning.

Compared to Participants 1 and 4, Participants 2 and 3 were more cautious and controlled with technology integration. Participant 2 used technology only when he had to. His use was limited to YouTube videos related to the topic he taught. He often made use of PowerPoint Presentations. He mainly used conventional methods. He also used smart boards. He stated that he didn't feel a need to use other tools incorporating technology:

> I used to introduce the content and course materials during the lesson. I benefited from smart boards, internet, and some related YouTube videos. I didn`t use Web 2.0 applications. In fact, at those times, I didn't feel a need to use other tools requiring technology.

Participant 3 mentioned that he has never been a technology friendly person. He defined himself as a 'technology defected person' and restricted his personal integration of technology into education to "using only the technology that is enforced on us by school, like smart board and videos."

During the pandemic, all four participants delivered remote classes using the learning environments provided by their university. Participant 1 explained that he just replaced the hardcopy materials with the softcopy ones for the remote classes, which goes to prove that the obligatory integration of technology did not enhance good applications of technology in teaching. He also added, "Instead of taking the hardcopies of info-gap activities to the classroom, I shared a pdf or jpeg format of these activities with the students via WhatsApp". Participant 2 mentioned using online discussion platforms to increase the interaction during online teaching. He found that it was the medium that could make the lessons more meaningful and practical. Participant 4 who was already familiar with educational technology stated that he learned some new apps. He made use of Wordwall.net and learningapps.com. He also used online platforms like Zoom and WebEx during the pandemic. Participant 3 stated that he started to conduct the same lessons online and did not change his teaching practices, but only adapted them to meet the new medium of delivery.

As for the challenges or problems encountered during this process, all participants used similar online course delivery platforms and conducted their classes in the same manner. They experienced similar problems like low student participation ending up with teacher-centred sessions. They had to stay in front of the computer for long hours to grade assignments, to give feedback, and to teach. They all lacked student-teacher, and student-student interaction during their sessions. Because of the online nature of the classes, Participant 1 complained about courses being more teacher centred. This participant was not happy about the teaching practice during online classes in general. He thought he was the dominant figure during the sessions which he did not prefer. Conducting online exams was another challenge for Participant 2. He stated that he had to assign either homework or open-ended questions to be able to track students' progress and assess their performance.

After Covid-19, all four participants taught 60% of their classes face-to-face and Participant 2 stressed the communication that students establish with their teachers and peers being the most important part of the language learning process. He also observed that students seemed more appreciative of the effectiveness of the face-to-face lessons conducted in the classroom. All participants were aware that technology in education penetrated all schools, and this affected all stakeholders in the process, teachers, students, book publishers, material writers and curriculum designers.

Participant 2 who was not happy about his online teaching practice because of its being more teacher centred continues using LMS more actively than he used to. He uploaded some videos and chapters in pdf format and asked his students to watch and read them before attending the face-to-face class. He flipped his classroom with the help of technology integration and found it useful. He thought it saved him time and he could carry out deeper and more discussions during class time. He also used online lessons to carry out some make-up or remedial online lessons for his students to watch and study later.

Participants were affected by the intensive use of technology during the Covid-19 pandemic. The ones who thought that they can do without technology also started to use some tools, platforms to assist their teaching. Especially the fact that students could access their classes thanks to technology slightly changed their ideas.

When it comes to their beliefs about technology integration, they were all aware of the importance of the concept, especially in terms of foreign language teaching. They emphasized the important role played by technology in making the language learning tools available to all students. Participant 1, despite having to adapt to new technologies which were compulsory, started to invent some ways to benefit from technology. For example, he explained that he used Google Docs as an online whiteboard and stored the notes as 'Class Notes'. His beliefs seem to have undergone major changes after Covid-19 pandemic. This obligatory remote teaching period made him more enthusiastic to look for ways to integrate technology in his teaching. Participant 3 also said,

> The use of Web 2.0 tools and apps inside and outside the classroom brings variety, increases attention, and reinforces learning. The use of technology also provides students with various options to produce written and spoken work.

Three participants agree on the idea that technology assists both students and teachers in language learning and teaching. Because online tools can create authentic atmosphere and content for the language learners, they all find it useful. This idea has been the same before and after the Covid-19 pandemic. Teachers believe in the benefits that technology brings to the classroom.

Participant 2 acknowledged that he was afraid to use technological tools, but during Covid-19 he realized that he could learn how to.

A final theme in participant responses to the question of how the pandemic with online teaching affected academicians is the theme of a change in the role of technology in education. On this point, respondents underlined the view that the use of technology should not be an aim but a tool for effective teaching and learning. After two years of increased engagement with tools of online teaching, lecturers believed the excessive use of technology in the classroom inevitably turned into a classroom routine after a while.

They also argued that in the second year of the pandemic and in the post-pandemic era, it was much easier to use technology and web tools during a face-to-face class, partially due to the experience gained over the months and partially

thanks to the ease of giving direct instruction in the classroom setting. Their overall feedback was that technology had helped them eliminate many boundaries as websites, apps or Web 2.0 tools etc. functioned as a partner or assistant for teachers, while allowing learners to reach resources of information and tools for producing written and spoken work before, during or after the sessions.

How Do the University Lecturers Envision Education After the Pandemic?

The third question explored participants' foresight of education after the pandemic. At a time when everything went back to old habits and routines, how university lecturers saw the future of education and the role of technology in this process was worth exploring, with a hope that the pandemic, despite all its devastating effects, may pave a way to some positive changes in education. A closer look into participants' responses on how they envision education after the pandemic revealed that all four participants agreed that after the pandemic, integrating technology into education was indispensable and necessary.

Participant 1, *"*After the pandemic, the necessity of using technology in education has entered our lives.*"*

Participant 2*: "*The use of technology in education will still be important and effective after the pandemic."

Participant 3: "In teaching and testing, technology will be more in the center."

Participant 4*: "*Technology and educational technology are going to become compulsory part of educational programs."

Although all four participants agreed on the importance of technology integration in education, they all highlighted different aspects of the possible role of technology in education. Participant 1, for example, acknowledging the positive impact of this process on teachers and students alike, highlighted how this process had also initiated and accelerated change in book publishers', material writers', and curriculum designers' attitudes and practices. He stated that *"*with this effect, teaching tools, procedures, approaches, and materials have thus changed and will continue changing*".* As for his vision for the future of education in general and language education in specific, he concluded that "education has changed and thus enriched considerably after the pandemic.*"*

Participant 2 emphasized the fact that the post-pandemic era can offer enhanced opportunities for "individualized and customized learning*"*. He mentioned that mobile learning paved the way for this change and stated that "individuals can choose when, how, and what to study*"*, taking responsibility for their own learning. Comments by Participant 2 regarding the increased use of mobile learning closely parallel the comments by Participant 1 about enriched learning environments. Participant 1 also stated the increased availability of online components for teachers and students to foster out-of-class study, autonomy, and self-regulated learning.

Participant 3 commenting on the possible role and importance of technology in teaching and testing, focused on the lessons to be drawn from this process. He asserted that the pandemic caught his university at a time when it was not ready for ERTL. He stated that,

> During the pandemic, we have been able to understand how planning is important and that more investment has to be made in technological infrastructure and access to quality internet*.*

Since the post-pandemic era may welcome and require more extensive integration and use of educational technologies to enrich teaching-learning processes, he emphasized the importance of teachers' and learners' familiarity with technology and web tools and stated that this familiarity with the tools and the technology needs to be increased through trainings, so that both students and teachers felt more eager to attend online classes. As his vision for the future of education in post-pandemic era, he predicted that "governments may prefer relying on online instruction instead of making students go to school because building and furnishing schools cost a lot". That is why he argued authorities in education must spend more time and energy to overcome technical, infrastructural, or motivational problems related to online education.

Participant 4, deriving from a detailed analysis of the current situation and its possible impacts on future practices, concluded that "integration of technology is going to become compulsory". He stated that the Council of Higher Education had already declared that online classes were going to be a constituent of curricula at both secondary and tertiary level, which basically meant that online / blended classes were going to be in teachers' and students' lives even after the pandemic. In this regard, he feared that "equal opportunity in education*"* would be affected severely due to differences between competent and less competent teachers. He mentioned that although the pandemic boasted the number of online teachers, the differences among these teachers with reference to online teaching skills, digital skills, and e-skills, as well as varying levels of competencies in educational technology are going to cause huge gaps in knowledge and skills within the upcoming generation. He also warned about "the threat of digital gap among the younger generation arising from financial, educational, and social inequalities within the same community". He asserted that access to the internet, families' attitudes towards technology, and differences in school policies and practices, especially between private and public schools, were the underlying reasons for the growing gap in digital skills.

To conclude, in the post-pandemic era, when everyone expects to go back to old practices and routines, the participants of the study believe that the use of technology in education is going to increase remarkably. Focusing on different aspects of this integration, the participants emphasized the importance of mobile learning for customized learning; a noticeable increase in the use of educational technology in teaching and testing; a need to enhance the infrastructure to avoid any further technical issues; and a need for continuous development opportunities for teachers and students to keep them familiar with new technologies. However, they were also concerned about the fact that there would be a digital gap between the students who have access to technology and those who do not.

Discussion

The aim of this study is to explore the impact of the pandemic as an unexpected situational variable on university instructors' perceptions and attitudes towards technology integration, as well as how they envision the future of education in post Covid-19 era. The primary findings of the study and their implication for the field are as follows:

- *From despair to accepting the new norm*: Changes in educational practices caused by Covid-19 pandemic initially led instructors to feel in despair, yet later they adapted to the new teaching medium and developed their own strategies to cope with the challenges brought about by the pandemic. Instructors' technology acceptance (perceived usefulness, competence, and confidence) levels affected the ease and pace of adaptation.

   Similar to the findings of Merisi and Pillay's (2020) study, the participants in this study indicated that they experienced an initial shock when strict measures were first introduced, yet later, they got adjusted and felt more comfortable. In this period, they first felt less competent, isolated, and lost, because the pandemic caught them unprepared, and the decisions taken by administrators were spontaneous and restricted to actual physical and technological resources available (Winter et al., 2021). Similar to the finding of Schlichter (2020), spontaneity and unpreparedness in decision-making probably made the participants feel weaker as instructors.

- *Enhanced quality in teaching and learning over time*: Instructors were not content with the quality of education in the first year of the pandemic because of the uncertainty, spontaneity of decisions, lack of quality interaction in the classroom, assessment procedures, and general low student participation. When they first started teaching, they felt their classrooms were mostly teacher centred with little interaction. However, in the second year, they reported having found effective ways of engaging students, making their classroom more learner-centered and interactive.

   The poor quality and quantity of interaction in remote teaching were also indicated in other studies investigating online education during Covid-19 (Celik et al., 2022; Ghanbari & Nowroozi, 2022; Mohamad et al., 2023). Furthermore, previous studies also highlighted the psychological impact of Covid-19 on instructors, causing dissatisfaction, stress, burn-out, and anxiety (Sokal et al., 2020; Wakui et al., 2021). Since the instructors could neither teach in the way they believed was most effective nor connect with their students easily, affecting the rapport in the classroom in the first year of the pandemic, they felt dissatisfied with their teaching.

- *From established to new practices:* The instructors experienced a remarkable change in their teaching practices from the beginning of the pandemic to the end. Initial feelings of discomfort led to a feeling of satisfaction as the instructors altered their established way of teaching to meet the emerging needs of the pandemic period. As also reported by Li and Huang (2017), when instructors started teaching in a new mode of delivery without any prior preparation or training, their existing skills and knowledge may have failed to help them, leading to discomfort. Hence, the lack of professional training and the need for urgent preparation of online learning infrastructure may have negatively affected instructors' perceptions of online education (Mohamedbhai, 2020).

- *More involvement, a more positive approach to technology integration*: During the pandemic, instructors' use of educational technologies increased considerably, making them more confident. They also diversified their use by integrating new web tools and applications, depending on their prior familiarity and competence in technology integration. The increased use of technology has also led to a change in instructors' cognition, especially with instructors who have lower levels of technology acceptance because they stated they are more willing to make use of technology in their face-to-face classrooms in the post-pandemic period. As in the study of Alfaleh (2022), the Covid-19 pandemic led to a change in participants' cognition and teaching practices. However, this finding is contradictory to what Lee and Jung (2021) found. In their study, it was found that this period led to a change in practices, but not in beliefs. In this study, a change in both practices and beliefs has been observed. Based on the finding of this study and the confirmation from Alfaleh's study, it is fair to conclude that Covid-19 process as an unexpected situational variable caused a change in instructors' technology acceptance level. This conclusion is also supported by Fullan and Stiegelbauer (1991, as cited in Ertmer & Ottenbreit-Leftwich, 2010, p. 258) model of requirements for change in education, who have stated that novel or altered instructional resources, technology as innovation leads to change in teachers' cognition.

- Participants of this study improved their teaching style and gained new skills after accepting the challenges. This confirms the findings of previous research by Ghanbari and Nowroozi (2022) and Razkane et al. (2022). The

study has shown that teaching online during Covid-19 period had some remarkable impact on participants' post-pandemic teaching experiences. Looking from the perspective of professional development, this process helped them develop confidence and polish their teaching skills. In line with A. Thomas et al. (2022), despite going through some challenges, participants want to continue online classes in the future. Evaluating the process from the angle of the technology acceptance model, the participants who had positive attitudes to technology integration easily adapted to the changing demands and experimented more freely with the resources available as also stated by Ghanbari and Nowroozi (2022).

- As for instructors' predictions regarding the role of technology in education in the post-pandemic period, all participants are expecting more diversified and intensive use of technology in the classroom in all areas of planning, conducting, and assessing teaching-learning practices. Technology is regarded as an indispensable part of education after the pandemic and all the participants agreed that some aspects of technology integration, like mobile, online, and blended learning to complement mainstream education, are going to play a pivotal role in education. Customized or individualized programs will become more common, and technology will also play a major role in assessment. At this point, it is also necessary to focus on two significant conclusions derived from the participants. One of the participants emphasized the necessity to have a plan for times when ERTL may again be necessary as also suggested by Alfaleh (2022). Meanwhile, governments and local authorities should enhance their technical infrastructure and provide equal access to technology and Internet for everyone. These findings reveal a positive shift in beliefs about the effectiveness of technology integration and are parallel with the findings of Mohamad et al. (2023).

Conclusion

The current study investigated the university instructors' online teaching experience during Covid-19 pandemic. It specifically focused on deeper analysis of the instructors' perceptions and attitudes towards technology integration, as well as their vision about the future of education in post-Covid-19 era. Similar to earlier studies (Akram et al., 2021; Ali & Mohammadzadeh, 2022; Khong et al., 2023; Su, 2023; Wang, 2022) which have investigated the challenges, opportunities and threats the Covid-19 pandemic brought about in the world, this study has also shown that the instructors were in despair when the ERTL was first introduced. When the restrictions to preserve public health led to changes in education that were spontaneous and unplanned, the instructors felt discomfort and less confidence as they could not employ their preferred and established way of teaching in the new environment; however, then they adapted to the changing circumstances and altered their teaching style to meet the new needs. This process did not only help increase their confidence and sharpen their teaching skills, but also led to some changes in their beliefs and practices, especially with regard to integration of educational technology.

The obligatory shift to online education has also caused some major changes in instructors' beliefs on the use of technology in education. The ones who were already familiar and integrated technology in their teaching continued doing so by adding new ways and tools, however, the ones who were a bit resistant to using technology found out that some tools really helped them teach their classes effectively and changed their mind regarding technology integration. The significance of the findings of this study is that change in cognition, in contrast to what is generally believed to arouse from voluntary, pre-planned change, can also come from compulsory exposure to instructional resources, technology, or materials. Participants who were resistant to using technology and considered the integration of technology unnecessary, and hence limited their use of it to a minimum in their classrooms prior to Covid-19, were convinced to make more use of it at the end of the pandemic period and argued that technology should be an indispensable part of education as long as it is used to fit its purpose.

Recommendations

The insights gained from this study may contribute to the existing literature towards a better understanding of the changes in instructors' beliefs and practices on technology integration when they experience new instructional practices or novelties as a mandatory component of a curriculum during the Covid-19 pandemic. As the study employs detailed accounts of participants' ideas, it might provide the opportunity to grasp what teachers with different backgrounds and perceptions had gone through and consider what could have been done better in such cases. This study has found that change can come from mandatory practices and does not always need to be voluntary. Further research can investigate this phenomenon for a deeper understanding of factors affecting change in teacher cognition.

The study showed that general teaching experience does not help in times of crisis. Although all instructors in this study were experienced, when they went through an unexpected novelty, they felt in need of help. Instructors should be equipped with the necessary techniques to deliver remote teaching (Bates, 2020) because a successful shift to ERTL depends on instructors. That is an important indicator of a need for continuous development opportunities for teachers and students to keep them familiar with new technologies. Furthermore, as also emphasized by one of the instructors of the study, the technological infrastructure in all schools should be enhanced.

A broader study could be conducted with the participation of more instructors and a bigger picture of change in instructors' beliefs and practices during the Covid-19 pandemic could be captured to portray the experience. Besides, this study focused on Covid-19 ERTL as a potential catalyst for change. A similar study could be conducted with emerging

or existing disruptive technologies such as AI tools to understand how the implementation of these leads to a change in the behaviour and beliefs of instructors.

Limitations

This study included four participants working at a public university. The instructors explained that they did not go through specific training to deliver online teaching. The results of a study with teachers who had specific training in a private/public university might give different results. Besides, every teacher is unique in his/her ideas on technology, online teaching, and emergency remote teaching. More participants may provide different perspectives. Hence, the results of this study cannot be generalized to all institutions with similar profiles of instructors.

Ethics Statements

The participants provided their written informed consent to participate in this study.

Authorship Contribution Statement

Ates Ozdemir: Conceptualization, design, drafting manuscript, analysis, writing, critical revision of manuscript. Saglam: Conceptualization, design, drafting manuscript, analysis, writing, critical revision of manuscript. Erkir: Conceptualization, design, drafting manuscript, analysis, writing, critical revision of manuscript.

References

Akram, H., Yingxiu, Y., Al-Adwan, A. S., & Alkhalifah, A. (2021). Technology integration in higher education during COVID-19: An assessment of online teaching competencies through technological pedagogical content knowledge model. *Frontiers in Psychology, 12*, Article 736522. https://doi.org/10.3389/fpsyg.2021.736522

Alfaleh, M. A. (2022). Exploring the Professional Experiences of Saudi K-12 Teachers During the COVID-19 Pandemic [Doctoral dissertation, Virginia Polytechnic Institute and State University]. Virginia Tech. https://shorturl.at/invJ6

Ali, S. S., & Mohammadzadeh, B. (2022). Iraqi Kurdish EFL teachers' beliefs about technological pedagogical and content knowledge: The role of teacher experience and education. *Frontiers in Psychology*, *13*, Article 969195. https://doi.org/10.3389/fpsyg.2022.969195

Ateş Özdemir, E. (2013). *Improving English language teachers' ICT skills & developing positive attitudes towards the use of technology in language teaching through an online course* [Doctoral dissertation, Cukurova University]. Ulusal Tez Merkezi [National Thesis Center]. https://bit.ly/3OPTbPY

Bagozzi, R. P., Davis, F. D., & Warshaw, P. (1992). Development and test of a theory of technological learning and usage, *Human Relations*, *45*(7), 659-686. https://doi.org/10.1177/001872679204500702

Bali, S., & Liu, M. C. (2018*).* Students` perceptions toward online learning and face-to-face courses. *Journal of Physics: Conference Series*, *1108,* Article 012094. https://doi.org/10.1088/1742-6596/1108/1/012094

Bates, A. W. (2020). *Advice to those about to teach online because of the corona-virus*. Online Learning and Distance Education Resources. https://shorturl.at/gAGNT

Beishuizen, J. (2008). Does a community of learners foster self-regulated learning*? Technology, Pedagogy and Education, 17*(3), 183-193. https://doi.org/10.1080/14759390802383769

Borg, S. (2003). Teacher cognition in language teaching: A review of research on what language teachers think, know, believe, and do. *Language Teaching*, *36*(2), 81-109. https://doi.org/10.1017/S0261444803001903

Celik, B., Darici, N., Yildiz, Y., & Yucedal, H. M. (2022). Psychological effects of online education during Covid 19 process on students: Tishk International University case. *Canadian Journal of Educational and Social Studies, 2*(2), 55–69. https://doi.org/10.53103/cjess.v2i2.31

Creswell, J. W., Hanson, W. E., Clark, V. L. P., & Morales, A. (2007). Qualitative research designs: selection and implementation*, The Counselling Psychologist, 35*(2), 263-264. https://doi.org/10.1177/0011000006287390

Daniel, S. J. (2020). Education and the COVID-19 pandemic. *Prospects*, *49*, 91-96. https://doi.org/10.1007/s11125-020-09464-3

Davis, F. D. (1989). Perceived usefulness, perceived ease of use, and user acceptance of information technology. *MIS Quarterly*, *13*(3), 319-340. https://doi.org/10.2307/249008

Dhawan, S. (2020). Online learning: A panacea in the time of COVID-19 crisis. *Journal of Educational Technology Systems, 49*(1), 5-22. https://doi.org/10.1177/0047239520934018

Englund, C., Olofsson, A. D., & Price, L. (2017). Teaching with technology in higher education: Understanding conceptual change and development in practice. *Higher Education Research & Development*, *36*(1), 73-87. https://doi.org/10.1080/07294360.2016.1171300

Ertmer, P. A. (2005). Teacher pedagogical beliefs: The final frontier in our quest for technology integration? *Educational Technology Research and Development, 53*, 25–39. https://doi.org/10.1007/BF02504683

Ertmer, P. A., & Ottenbreit-Leftwich, A. T. (2010). Teacher technology change: How knowledge, confidence, beliefs, and culture intersect. *Journal of Research on Technology in Education, 42*(3), 255-284. https://doi.org/10.1080/15391523.2010.10782551

Ghanbari, N., & Nowroozi, S. (2022). Iranian EFL teachers' challenges and coping strategies during COVID-19 pandemic: A case study. *The Qualitative Report, 27*(3), 605-625. https://doi.org/10.46743/2160-3715/2022.5066

Hanafi, H. F., Said, C. S., Wahab, M. H., & Samsuddin, K. (2017, August). Improving students' motivation in learning ICT course with the use of a mobile augmented reality learning environment. *IOP Conference Series: Materials Science and Engineering, 226*, Article 012114. https://doi.org/10.1088/1757-899X/226/1/012114

Hass, A., & Joseph, M. (2018). Investigating different options in course delivery – traditional vs online: is there another option? *The International Journal of Information and Learning Technology*, *35*(4), 230-239. https://doi.org/10.1108/IJILT-09-2017-0096

Hickling, S., Bhatti, A., Arena, G., Kite, J., Denny, J., Spencer, N., & Bowles, D. C. (2021). Adapting to teaching during a pandemic: Pedagogical adjustments for the next semester of teaching during COVID-19 and future online learning, *Pedagogy in Health Promotion, 7*(2), 95–102. https://doi.org/10.1177/2373379920987264

Hodges, C. B., Moore, S., Lockee, B. B., Trust, T., & Bond, M. A. (2020). *The difference between emergency remote teaching and online learning,* Educause. https://shorturl.at/mzGTU

Juárez-Díaz, C., & Perales, M. (2021). Language teachers' emergency remote teaching experiences during the COVID-19 confinement. *Profile Issues in Teachers Professional Development, 23*(2), 121-135. https://doi.org/10.15446/profile.v23n2.90195

Jupp, V. (2006). *The Sage dictionary of social research methods*. Sage Publications. https://doi.org/10.4135/9780857020116

Kang, Y., & Cheng, X. (2014). Teacher learning in the workplace: A study of the relationship between a novice EFL Teacher's classroom practices and cognition development. *Language Teaching Research, 18*(2), 169–186. https://doi.org/10.1177/1362168813505939

Kemp, N., & Grieve, R. (2014). Face-to-face or face-to-screen? undergraduates' opinions and test performance in classroom vs. online learning. *Frontiers in Psychology*, *5,* Article 1278. https://doi.org/10.3389/fpsyg.2014.01278

Khong, H., Celik, I., Le, T. T. T., Lai, V. T. T., Nguyen, A., & Bui, H. (2023). Examining teachers' behavioural intention for online teaching after COVID-19 pandemic: A large-scale survey. *Education and Information Technologies, 28*, 5999–6026. https://doi.org/10.1007/s10639-022-11417-6

Lam, B.-H., & Kember, D. (2006). The relationship between conceptions of teaching and approaches to teaching. *Teachers and Teaching, 12*(6), 693-713. https://doi.org/10.1080/13540600601029744

Lawless, K. A., & Pellegrino, J. W. (2007). Professional development in integrating technology into teaching and learning: Knowns, unknowns, and ways to pursue better questions and answers. *Review of Educational Research, 77*(4), 575–614. http://dx.doi.org/10.3102/0034654307309921

Lee, J., & Jung, I. (2021). Instructional changes instigated by university faculty during the COVID-19 pandemic: The effect of individual, course and institutional factors. *International Journal of Educational Technology in Higher Education, 18*, Article 52. https://doi.org/10.1186/s41239-021-00286-7

Li, Y., & Huang, J. (2017). Understanding factors that influence technology integration in English language teaching: A structural equation modelling approach. *Educational Technology & Society, 20*(2), 226-237.

Marikyan, D., & Papagiannidis, S. (2022). Technology acceptance model: A review. In S. Papagiannidis (Ed.)*, TheoryHub book.* TheoryHub. https://open.ncl.ac.uk./theoryhub-book/

Merisi, P., & Pillay, A. (2020). Emergency remote teaching in higher education: How academics identify the educational possibilities. In N. Ndimande-Hlongwa, L. Ramrathan, N. Mkhize, J. A. Smit (Eds.), *Technology-based teaching and learning in higher education during the time of COVID-19* (pp. 74-91). CSSALL Publishers (Pty) Ltd. https://doi.org/10.29086/978-0-9869936-1-9/2020/AASBS02

Mohamad, M., Wahab, S. M. A., & Kummin, S. (2023). Challenges and strategies taken by English language educators in tertiary institutions during emergency remote teaching and learning (ERTL). *Arab World English Journal, 14*(1), 28-42. https://doi.org/10.24093/awej/vol14no1.2

Mohamedbhai, G. (2020). *COVID-19* what consequences for higher education in Africa? *International Higher Education*, (102), 30-32. https://bit.ly/3KSuWQd

Mohammadi, M., & Moradi, K. (2017). Exploring change in EFL teachers' perceptions of professional development. *Journal of Teacher Education for Sustainability, 19*(1)*,* 22–42. https://doi.org/10.1515/jtes-2017-0002

Mueller, J., Wood, E., Willoughby, T., Ross, C., & Specht, J. (2008). Identifying discriminating variables between teachers who fully integrate computers and teachers with limited integration. *Computers and Education, 51*(4), 1523–1537. https://doi.org/10.1016/j.compedu.2008.02.003

Oumar, B. S., Aziz, S. A., & Wok, S. (2021). The impact of emergency remote teaching and learning (ERTL) during COVID-19 pandemic on students. *Journal of Communication Education, 1*(1), 23-38.

Raes, A., Detienne, L., Windey, I., & Depaepe, F. (2020). A systematic literature review on synchronous hybrid learning: Gaps identified. *Learning Environments Research*, *23*, 269-290. https://doi.org/10.1007/s10984-019-09303-z

Razkane, H., Sayeh, A. Y., & Yeou, M. (2022). University teachers' attitudes towards distance learning during COVID-19 pandemic: Hurdles, challenges, and take-away lessons. *European Journal of Interactive Multimedia and Education, 3*(1), Article e02201. https://doi.org/10.30935/ejimed/11436

Schlichter, A. (2020). *The impact of Covid-19 on education: Insights from education at a glance.* OECD Publishing. https://bit.ly/3yBKBNf

Singh, J., Steele, K., & Singh, L. (2021). Combining the best of online and face-to-face learning: Hybrid and blended learning approach for COVID-19, post vaccine, & post- pandemic world. *Journal of Educational Technology Systems, 50*(2), 140–171. https://doi.org/10.1177/00472395211047865

Sokal, L., Trudel, L. E., & Babb, J. (2020). Canadian teachers' attitudes toward change, efficacy, burnout during the COVID-19 pandemic. *International Journal of Educational Research Open*, *1*, Article 100016, https://doi.org/10.1016/j.ijedro.2020.100016

Soon, K. H., Sook, K., Jung, C. W., & Im, K. M. (2000). The effects of Internet-based distance learning in nursing. *Computer in Nursing, 18*(1), 19-25.

Stevens, G. J., Bienz, T., Wali, N., Condie, J., & Schismenos, S. (2021). Online university education is the new normal: but is face-to-face better? *Interactive Technology and Smart Education, 18*(3), *278-29*7. https://doi.org/10.1108/ITSE-08-2020-0181

Su, Y. (2023). Delving into EFL teachers' digital literacy and professional identity in the pandemic era: Technological Pedagogical Content Knowledge (TPACK) framework. *Heliyon, 9*(6), Article e16361. https://doi.org/10.1016/j.heliyon.2023.e16361

Subramaniam, K. (2007). Teachers' mindsets and the integration of computer technology. *British Journal of Educational Technology, 38*(6), 1056–1071. https://doi.org/10.1111/j.1467-8535.2006.00693.x

Taimalu, M., & Luik, P. (2019). The impact of beliefs and knowledge on the integration of technology among teacher educators: A path analysis. *Teaching and Teacher Education, 79,* 101-110. https://doi.org/10.1016/j.tate.2018.12.012

Taylor, P. C., & Settlemaier, E. (2003). Critical Autobiographical research for science educators. *Journal of Science Education Japan*, *27*(4), 233-244. https://doi.org/10.14935/jssej.27.233

Thomas, A., Shenoy, M. T., Shenoy, K. T., Suresh Kumar, S., Sidheeque, A., Khovidh, C., Parameshwaran Pillai, J., Pillai, P. M., CH, S. S., Mathew, A., Zakkir, T., Dileep, S., Mekha, V., Raju, S., Junaid K, M., & P, S. (2022). Teachers' view on online classes during COVID-19 lockdown – a cross-sectional Study. *International Journal of Medical Students, 10*(1), 32–37. https://doi.org/10.5195/ijms.2021.793

Thomas, J., & Harden, A. (2008). Methods for the thematic synthesis of qualitative research in systematic reviews. *BMC Medical Research Methodology, 8*, Article 45. https://doi.org/10.1186/1471-2288-8-45

Toquero, C. M. D. (2020). Emergency remote teaching amid COVID-19: the turning point, *Asian Journal of Distance Education*, *15*(1), 185-188. https://doi.org/10.5281/zenodo.3881748

United Nations International Children's Emergency Fund. (2020, April 20). *UNICEF and Microsoft launch global learning platform to help address COVID-19 education crisis.* https://shorturl.at/krS17

University at Buffalo Office of Curriculum, Assessment and Teaching Transformation. (n.d.). *Delivery modes and teaching approaches*. https://shorturl.at/bgnR7

Vanslambrouck, S., Zhu, C., Lombaerts, K., Philipsen, B., & Tondeur, J. (2018). Students' motivation and subjective task value of participating in online and blended learning environments. *The Internet and Higher Education, 36*, 33-40. https://doi.org/10.1016/j.iheduc.2017.09.002

Wakui, N., Abe, S., Shirozu, S., Yamamoto, Y., Yamamura, M., Abe, Y., Murata, S., Ozawa, M., Igarashi, T., Yanagiya, T., Machida, Y., & Kikuchi, M. (2021). Causes of anxiety among teachers giving face-to- face lessons after the reopening of schools during the COVID-19 pandemic: A cross-sectional study. *BMC Public Health*, *21*, Article 1050. https://doi.org/10.1186/s12889-021-11130-y

Wang, A. Y. (2022). Understanding levels of technology integration: A TPACK scale for EFL teachers to promote 21st-century learning. *Education and Information Technologies, 27*, 9935–9952. https://doi.org/10.1007/s10639-022-11033-4

Winter, E., Costello, A., O'Brien, M., & Hickey, G. (2021). Teachers' use of technology and the impact of Covid-19. *Irish Educational Studies*, *40*(2), 235-246. https://doi.org/10.1080/03323315.2021.1916559

World Health Organization. (2020). *Naming the coronavirus disease (COVID-19) and the virus that causes it.* https://bit.ly/3se8ryr

Yin, R. K. (2009). *Case study research: Design and methods* (4th ed.). Sage.

You, J. W., & Kang, M. (2014). The role of academic emotions in the relationship between perceived academic control and self-regulated learning in online learning. *Computers & Education, 77*, 125-133. https://doi.org/10.1016/j.compedu.2014.04.018