



Exploring predictors of teachers' self-efficacy for online teaching in the Arab world amid COVID-19

Sandra Baroudi¹ · Nessrin Shaya²

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Abstract

The rapid development of information and communication technologies (ICT), and the unexpected transition to online teaching due to COVID-19 necessitates that teachers should have the knowledge, competent skills and strategies to integrate digital tools and platforms effectively. Literature suggests however that many teachers do not feel confident enough or lack perceived capability in teaching using advanced technologies in classrooms, and do not have positive self-efficacy beliefs towards their online teaching. Hence, the purpose of this mixed-method study is to investigate teachers' self-efficacy (TSE) in online learning environments amid COVID-19. A total of 150 K-12 teachers from six Arab countries were invited to participate in the study. Quantitative and qualitative data revealed that perceived self-efficacy of online teaching was high. Two main factors, receiving support to design online instruction and receiving professional development in online teaching, significantly predict participants' sense of self-efficacy. Teachers who have previous experience in online teaching scored higher on their self-efficacy than teachers with limited or no experience. Student engagement had the weakest correlation between the four scales with the overall self-efficacy. Parental involvement was discovered through the qualitative analysis to be an emerging factor that could enhance teachers' self-efficacy. Recommendations and limitations are further discussed.

Keywords Teacher self-efficacy · Technology integration · Online learning · Online teaching self-efficacy · Formal learning

✉ Sandra Baroudi
Sandra.baroudi@zu.ac.ae
Nessrin Shaya
nessrin.shaya@aue.ae

¹ Zayed University, Zayed, United Arab Emirates

² American University in the Emirates, DIAC, United Arab Emirates

1 Introduction

Based on United Nations reports, the lock down of a third of the global population in response to Coronavirus pandemic has disrupted the education of about 300 million students across the global, a figure described as ‘unprecedented’ (Bao, 2020). In the wake of COVID-19 pandemic, educational institutions proactively responded by moving classes online. The rise of online education necessitates that teachers should have the knowledge, competent skills and strategies to integrate digital tools and platforms effectively (König et al., 2020; Mahmood, 2020). Overnight, teachers in both private and public schools were forced to completely reinvent themselves and their teaching methods, through developing creative lessons to keep students engaged virtually, and explore unconventional ways to assess students’ learning remotely (Mahmood, 2020; Li & Lalani, 2020). Consequently, the result was increased workload concerns on academic rigor and fears of drop out, whilst the main strive was to ensure academic continuity through distance learning (Bintliff, 2021; Pressley, 2021).

Self-efficacy is an essential concept for schools, as teachers with high self-efficacy levels can maintain their motivation and take the right decisions towards better personal and students’ performance (Bandura & Locke, 2003; Creer & Wigal, 1993; Pressley, 2021). Self-efficacy principles impact actions individuals pursue, effort applied, steadiness in defeating limitations or disappointments, flexibility to hardship, their adaptation to environmental concerns, and finally the level of achievements reached (Bandura, 1977). To this end, empirical studies provided evidence of the positive association between teachers’ self-efficacy and their job satisfaction, commitment, productivity (i.e. Ayllón et al. 2019; Hampton et al., 2020; Moore, 2005) and with their instructional quality (i.e. Pressley, 2021; Richter & Idelman, 2017). Others showed its negative association with teachers’ burnout level (i.e. Bintliff, 2021; Ma et al. 2021; Pressley, 2021). Consequently, it is argued that having high teaching self-efficacy beliefs positively impacts students’ academic achievement and motivation (Lemon & Garvis, 2015; Tschannen-Moran et al., 1998).

During the pandemic, teachers with limited online teaching experience were not confident about their capabilities in teaching using advance technologies. Similarly, teachers who were not prepared to teach online and those who received little pedagogical support faced many challenges during the unexpected shift to the online teaching (Bao, 2020; Pressley, 2021; Rasmitadila et al., 2020; Toto & Limone, 2020). Accordingly, the rise of online teaching during COVID-19 posed numerous questions on quality and effectiveness of teaching (Mahmood, 2020), highlighting the importance of teacher’s efficacy in online instruction (Pressley, 2021) and the need for more research on teachers’ capabilities in online instruction and classroom management (Bao, 2020; Rasmitadila et al., 2020).

Much research has been done to investigate teachers’ self-efficacy (Corry & Stella, 2018; Ma et al. 2021; Pressley, 2021; Richter & Idelman, 2017). However, researchers certify that online course delivery varies significantly from face-to-face across several aspects, where differences are profound enough to call for distinct examination and separate comparison of the attributes of the online teaching experience (Corry & Stella, 2018; Rice, 2006). Despite its great influence on teaching effectiveness and students’ academic achievement, online TSE is rarely investigated, and very

few studies, to our knowledge, has been published post the outbreak of COVID-19 pandemic (Ma et al., 2021). This study intends to fill this gap and presenting as a major strength of the current research. Examining the antecedents and predictors of teacher self-efficacy in online instruction is valuable (Ma et al., 2021), in the hopes of better understanding teachers' support and training needs, upon transition to online learning environment, during current pandemic crisis and beyond (Dolighan & Owen, 2021; Ma et al., 2021).

To this end, this study hopes to answer these research questions:

RQ 1. To what extent teachers' use of computers, instructional strategies, classroom management, student engagement, can predict online TSE?

RQ2. Is there an association between participants qualifications and years of teaching experience with online TSE levels?

RQ3. What kind of teachers' support (receiving professional development in online teaching, receiving online teaching support from colleagues, or receiving support in designing online instruction) is the best predictor of online TSE?

RQ4. What are the inhibitors and facilitators that impact teachers' online TSE?

2 Literature review

2.1 Teachers' Self-efficacy

Teachers' self-efficacy is described as a subjective measure of teacher's capabilities of achieving associated tasks in the teaching profession (Ma at al. 2021; Corry & Stella, 2018), and has been amongst the most explored and examined dimensions in the field of teacher education (Ma at al. 2021; Horvitz et al., 2014; Poulou et al., 2018). The term 'self-efficacy' was first coined by Bandura (1977) and introduced as a theoretical framework to describe and predict the outcomes that individuals expect. The concept of self-efficacy is central to Albert Bandura's social cognitive theory, where his psychological experiments has shown that efficacy expectation is the mechanism by which variations in self-efficacy could be identified, while the latter was an influential factor affecting outcomes (Corry & Stella, 2018).

Self-efficacy framework was further developed in Bandura's 2001 scholarly research, where human agency was integrated with self-efficacy. Human agency known as individual's belief that he/she has the ability to coordinate learning skills, motivation and emotions, and hence, effectively act in any given environment to reach foreseen goal (Corry & Stella, 2018). In that sense, TSE can be described as the measure of a teacher's efficacy expectation in having ability and agency to influence student outcomes (Armor et al., 1976; Lemon & Garvis, 2015; Tschannen-Moran et al., 1998). Findings of a myriad of research studies have derived positive correlations between TSE and students' academic achievement and motivation (Goddard et al., 2000; Tschannen-Moran et al., 1998), and teacher related outcomes such as well-being, job satisfaction, commitment and productivity (Ayllón et al., 2019; Hampton et al., 2020; Moore, 2005).

2.2 Online teaching self-efficacy (TSE)

Researchers warrant that online course delivery varies significantly from face-to-face across several aspects such as context, environment, and nature of tasks, hence, calling for distinct examination, and this distinction may be particularly valid for TSE (Corry & Stella 2018). To this end, Tschannen-Moran and Hoy (2001) developed and validated an instrument that looked at TSE, the Teachers' Sense of Efficacy Scale (TSES), based on the work of Bandura (1977). The use of TSES has been further verified for its use with pre-service and in-service teachers, showing high internal consistent reliability (Htang, 2018). In measuring TSE, literature also shows that scale instruments developed in contexts specific to classical modes of teaching and learning, could be employed as the basis for instruments designed for use in online education (Corry & Stella 2018). In 2010, Robinia and Anderson, modified TSES to measure online TSE, through rewording the initial 24 items, and adding a set of 8 new items that capture features of online teaching. The new scale comprised 32 items and was titled as "The Michigan Nurse Educators Sense of Efficacy for Online Teaching (MNESEOT)". Aiming at identifying the determinants of nurse faculty self-efficacy levels and participation in online teaching, results showed that nurse educators' online teaching efficacy levels varied between "some" to "quite a bit". Findings of their study showed that predictors of online TSE are: online instructional strategies, teachers' computer skills, classroom management, and student engagement.

2.2.1 Self-efficacy in online instructional strategies

Instructional strategies refer to the ways and techniques teachers use to deliver their lessons. A number of instructional strategies are documented in literature as successful in online modes of teaching, such as: voice and pitch management, increased students' interactions and discussions, flexible teaching and assessment policies, transferring large lecturing class into small online modules, dividing teaching units into smaller chunks, combining online and offline self-learning, and emphasizing active learning (Bao, 2020; Mahmood, 2020). As such, teachers who are able to adequately use online instructional strategies delivered high quality of instruction which in turn created a successful classroom environment (Mahmood, 2020). The relationship between online instructional strategies and increased TSE in online instruction is evident in literature. For instance, Horvitz et al. (2014) conducted a study on 91 faculty using the MNESEOT instrument, showing that faculty demonstrated high levels of online self-efficacy in their instructional strategies compared to other dimensions such as fostering online student engagement. It is noteworthy to mention that gender was a significant predictor of self-efficacy in online instructional strategies, with females scoring high, indicating that females maybe better attracted towards teaching online (Horvitz et al., 2014).

Similarly, Dunbar and Melton (2018) examined the relationship between online TSE and the training that faculty received to teach online. Findings revealed few differences pertinent to efficacy in instructional strategy and computer use between different age groups. The only main difference in efficacy of computer use was demonstrated between 20 and 49 and 50–69 age groups. The younger the faculty was the

more capable and flexible they were to use the computer and look for different online apps to ensure a successful delivery of online teaching. This is further confirmed with Suprayogi et al. (2017), showing that teachers at early stages of their career (i.e. 5 years or less) are faster to adopt innovations and ICT in education, compared to highly experienced teachers who show resistance to new instructional pedagogies.

2.2.2 Self-efficacy in computer skills

A number of studies reported on online TSE with respect to teachers' technological knowledge and competencies (i.e. teachers' use of the Web or other computer-based applications). For instance, Dogru (2020) derived significant positive correlations between pre-service visual arts teachers' perceptions of computer self-efficacy and attitudes towards web-based instruction, using Perceptions of Computer Self-efficacy Scale and Attitudes Towards Web-based Instruction Scale. Culp-Roche et al. (2021) also reached similar findings upon examining the online TSE of nursing faculty teaching at one online course, using MNESEOT questionnaire. Participants reported high teaching self-efficacy, while computer skills proved to be the strongest predictor, and student engagement the lowest. Earlier in 1998, Presno showed that low self-efficacy in the use of technologies was the result of different type of technological anxiety (such as, navigation issues with the apps, delays in response, and fear of system crashing) resulting in teachers' stress and depression when goals are not met. In line with the increased need to have technologically proficient teachers, it is becoming evident that many teachers have waded through and mastered the barrage of various digital tools, but there are as many as those who are still resistant to technology, or unable to adapt. Whether these were external barriers (such as availability of adequate technological resources, professional development, and school support) or internal (such as teachers' self-confidence, pedagogical beliefs about how students acquire knowledge, and the perceived usefulness of incorporating technologies in the classroom), it is ascertained that teachers' beliefs are significant to their willingness to adapt to the online learning and use of technology (Hew & Brush, 2007; Ertmer et al., 2012). Teachers need to be convinced on the perceived value of technology integration in classrooms on teaching and learning, in order to develop positive attitude and adopt technology (Lemon & Garvis, 2015). In that sense, developing teachers' digital competencies is a solution to developing better attitudes and beliefs towards online teaching, that would in return enhance their online self-efficacy (Corry & Stella, 2018; Dolighan & Owen, 2021).

2.2.3 Self-efficacy in online classroom management

At the level of classroom management, it is generally well conceived that effective teaching and learning cannot occur in a classroom that is poorly managed, delineating on the importance of classroom management practices as a prerequisite for academic success (Korpershoek et al., 2016; Poulou et al., 2018). Self-efficacy in classroom management in that sense refers to teachers' beliefs on their capabilities to organize and implement activities and actions that lead to a positive learning environment. It is particularly manifested through designing a wide variety of effective strategies

that reinforce students' cognitive, as well as social-emotional behavior. Among the most well-known effective strategies are: creating rules, procedures, regulations and expectations around student behavior, the use of positive and negative reinforcement, adequately arranging the physical setting, driving independence, self-regulation and self-directed learning skills (Korpershoek et al., 2016; Poulou et al., 2018). A number of researchers ascertain that teachers with higher self-efficacy are able to better manage their classroom effectively suggesting a significant positive correlation between the two constructs (Horvitz et al., 2014; Poulou et al., 2018). While the aforementioned relationship has been demonstrated in face-to-face classroom, very few studies have attempted to examine the same in an online context (Ma et al. 2021).

2.2.4 Self-efficacy in online students' engagement

Literature to date indicated the positive correlation between teachers' self-efficacy and student engagement (Lemon & Garvis, 2015; Hampton et al., 2020). Many factors play a role in increasing teachers' self-efficacy in relation to students' engagement. First, having online teaching experience impacted teachers' ability to engage students in an online classroom (Kissau & Algozzine, 2015). Second, developing online teaching skills and third, receiving support to design online instructional strategies were correlated with online TSE and student engagement (Richter & Idleman, 2017). These professional development programs would prepare teachers to adopt and integrate technology in the favor of creating a student-centered classroom where students are active and self-directed learners (Ertmer et al., 2012; Schrum, 1999). That being said, students are engaged in the online learning where teachers design learning activities that are fun, challenging, and stimulating (Hampton et al., 2020; Horvitz et al., 2014).

2.3 Role of online teaching experience

A number of research studies have specifically addressed online TSE and its relation to particular demographic characteristics such as academic experience and years of experience in using the web. Kissau and Algozzine's (2015) causal-experimental design research highlighted the importance of having online teaching experience to effectively apply online teaching strategies, and ensure positive classroom management and student engagement. Teachers' responses showed that despite the number of professional development and training courses received, practical application of taught strategies in hybrid and online classes is needed. Yet, with respect to Web teaching experience, literature shows contrasting results, calling for more studies examining the nature of the role of online teaching experience on efficacy in online instruction (Dolighan & Owen, 2021).

For example, Lee and Tsai (2010) confirmed upon exploring online TSE by adding the web element to TPACK framework, that teachers with more experience using the web showed increased levels of self-efficacy. Hence, it is concluded that self-efficacy in technology application and computer skills significantly increases with the increase in online teaching experience (Lee & Tsai, 2010; Ma et al., 2021). Chang et

al. (2011) on the other hand observed that teachers with more experience pertaining to semesters taught online, had better self-efficacy in online classroom management.

2.4 Role of professional development in online teaching

The fundamental absence of teacher training and support was underlined as a common concern for teachers amid the outbreak of COVID-19 pandemic. A number of participating teachers in a number of studies declared that they were neither exposed to online teaching, nor receiving any training prior engaging online (Ma et al., 2021; Toto & Limone, 2020). To that end, teachers remain to this date, in urgent need for more training in designing and implementing online coursework. Receiving trainings in the forms of seminars that aim at developing teachers' online teaching skills, would increase their online TSE particularly in terms of instructional strategies, student engagement, and classroom management (Richter & Idleman, 2017). Furthermore, engaging teachers with professional development on ICT usage was a major source for nurturing their motivation and developing their online teaching practices during COVID-19 (Toto & Limone, 2020).

Hence a consensus is made among researchers stating the need for professional development designers to train teachers on how to adequately use and apply advance technologies for the favor of enhancing students' outcomes (Philipsen et al., 2019). Noting that the adoption of any new technology depends on teachers' confidence in their technical capabilities and beliefs about the importance of the ICT for learning (Donnelly et al., 2011; Schibeci et al., 2008).

Moreover, and in the face of the expanded adoption of online learning offerings post COVID-19, teachers' weakness in online TSE presents a challenge that threatens their effectiveness and hinders students' progress. One way for educational institutions to smooth the transition to online teaching and learning, is through supporting teachers to strengthen their online TSE. Training can take a number of forms such as: professional learning communities, mentorship programs and instructional design specialist support (Richter & Idleman, 2017). For instance, providing teachers with opportunities to practice online teaching would help them design online instruction with activities and games that are challenging for students' cognitive development. Accordingly, this underscores the importance of having a better understanding of the factors related to online TSE towards the possible impact on self-efficacy in online instruction, and more importantly, what kind of external support can elevate efficacy in online teaching.

3 Methodology

3.1 Research design

A mixed methods design was applied to answer the research questions and obtain a better understanding of the topic studied (Creswell, 2014; Fraenkel & Wallen, 2009). As such, the quantitative part followed a descriptive correlational design to explore the sense of efficacy in online education and to explain and interpret relationships

among the variables (Creswell, 2014). As for the qualitative part, an exploratory approach was deployed to generate subjective views and experiences of participants (Creswell, 2014). Qualitative data will provide complementary picture about participants experiences and challenges during the transition to the online learning to develop a complete understanding about the research problem.

3.2 Participants

Considering that the current study is exploratory in nature, targeting a large number of teachers was beyond the scope and available resources. A convenient sampling technique was adopted to help the researcher discover, understand and gain insights about the topic (Merriam, 2009). The power of this sampling method lies in collecting rich and in-depth information from individuals from whom we can learn a great deal (Merriam, 2009). Participants of this study were referred to by potential subjects chosen by the researchers. A total of 150 K-12 teachers from six Arab countries (Bahrain, Jordan, Lebanon, Oman, Saudi Arabia, and United Arab Emirates) who taught online core subjects (language arts, science, history, and mathematics) during the academic semester of Fall 2020 were invited to participate in the study. Out of the 150 surveys that were emailed to the teachers, 113 responded back with a response rate of 75%. The sample consisted of 83 females and 30 males. The age of 30% of teachers ranged between 18 and 35 years old, 65% of the teachers were between 35 and 55 years old and 5% of the teachers were older than 55. A total of 19 teachers participated from Lebanon, three from Jordan, 76 from the UAE, nine from KSA, four from Oman and finally two teachers from Bahrain participated. Around 53% of the participating teachers hold a Bachelor degree, 39% hold a Master's degree, 4% are Doctoral graduates and 4% of the participants completed another degree. In total, 45 participants were teaching in a public school and 68 participants in a private school. On average, participating teachers had around 15 years of teaching experience.

3.3 Instruments

This study adopted the Teachers' Sense of Efficacy Teaching Scale developed originally by Tschannen-Moran and Hoy (2001) and revised by Robinia and Anderson (2010). This instrument included a total of 32 items. Participants indicated their opinion about each of the questions by marking their answers ranging from (1) "None at all" to (9) "A Great Deal". The higher the cumulative score on the scale, the greater sense of efficacy for that aspect of online teaching. Factor analysis of the modified version of the instrument was conducted by Robinia and Anderson (2010) and revealed four factors: self-efficacy in online student engagement (0.93), self-efficacy in online instructional strategies (0.94), self-efficacy for online classroom management (0.93), and self-efficacy in the use of computers (0.86) and a total score for the entire instrument (0.93). However, to ensure internal consistency of factors within this study, we checked for Cronbach's α and we found that the instrument was confirmed to be highly reliable (32 items; $\alpha=0.967$). Also, the reliability of each factor was checked for this study: self-efficacy in online student engagement (0.91), self-

efficacy in online instructional strategies (0.93), self-efficacy for online classroom management (0.95), and self-efficacy in the use of computers (0.89).

As for the qualitative instrument, participants were asked to answer a total of 10 open-ended questions. These questions aimed to have a better understanding of teachers' experiences and perceptions towards the unprecedented transition to the online teaching. Hence, teachers were asked about their feelings towards the transition to the online teaching and learning; the obstacles faced during the online teaching and how they overcame these; and the factors that helped them adapt quickly to the online teaching during COVID-19.

3.4 Data analysis

Quantitative data was analyzed using the Statistical Package for the Social Sciences (SPSS) version 27. First, variables were computed by adding participants' responses for the items related to each of the self-efficacy subscale. Second, composite scores were created by dividing the scores by 9. After that, independent samples t-test analysis was used to explore if there are significant differences in the factors that affect TSE. Analysis of Variance ANOVA was also computed to examine the statistical significance of the regression model and see if it can predict the dependent variable (online TSE). Correlation analysis (Pearson Product Moment Correlation Coefficient) was computed to examine the association of the items for each dimension of the instrument and between the variables. Multiple regression was used to determine the best predictors of online TSE. Predictor variables included: qualifications, years of experience in online teaching, and formal and informal preparatory experiences, such as: receiving professional development in online teaching, receiving online teaching support from colleagues, and receiving support in designing online instruction.

As for the qualitative data, responses to the open-ended questions were analyzed following a thematic analysis approach. Two researchers coded the qualitative data to identify, compare and agree on common themes in order to build an in-depth understanding of the results. Having more than one coder increased the credibility and reliability of the analysis (Creswell, 2014). A total of six themes were identified: being unprepared to design online instruction, lack of familiarity with online educational applications and platforms, students' disengagement and classroom management, connectivity issues, and lack of technical support.

3.5 Results

3.5.1 Quantitative findings

Descriptive statistics indicated high scores of K-12 teachers' perceptions about their online TSE in the Arab world ($M = 7.38$, $SD = 1.10$). Teachers' efficacy in increasing student engagement had the lowest mean score ($M = 7.09$, $SD = 1.15$) whereas their efficacy in adopting online instructional strategies had the highest mean score ($M = 7.46$, $SD = 1.14$) when compared to the rest of the items. Table 1 below presents the minimum, maximum, mean and standard deviation per variable.

Table 1 Descriptive statistics for online TSE scales

	Minimum	Maximum	Mean	Std. Deviation
Student Engagement	4.00	9.00	7.09	1.15
Instructional Strategies	3.75	9.00	7.46	1.14
Classroom Management	3.00	9.00	7.32	1.15
Computer Use	3.50	9.00	7.36	1.27

As shown in Table 2 below, strong significant correlations exist between the different scales of teachers' self-efficacy and their overall online TSE. The strongest correlation was between online TSE and Instructional strategies ($r=0.966$) while student engagement had the weakest correlation between the four scales ($r=0.896$). Additionally, Pearson correlation coefficient results, revealed that the strongest correlations among the four scales was Instructional strategies and Classroom management ($r=0.872$). The most moderate correlation was Computer use and Student engagement ($r=0.721$) and also between Computer use and Classroom management ($r=0.785$).

ANOVA analysis explored the impact of teachers' qualifications on teachers' online TSE. There was no statistically significant difference at the $p < .05$ level in self-efficacy for the teachers with a Bachelor's degree, Master's degree, Doctorate or other degrees: $F(3.89) = 2.63$, $p > 0.05$. Participants' qualifications do not differ in terms of their self-efficacy scores. Independent samples t-test showed a significant difference in self-efficacy scores for teachers who did have experience in online teaching ($M = 8.16$, $SD = 1.09$) and teachers who did not have experience in online teaching ($M = 7.20$, $SD = 0.73$; $t(89) = 3.48$, $p < 0.05$). Finally, the relationship between years of teaching experience and online TSE was investigated using Pearson product-moment correlation coefficient. Preliminary analyses were performed to ensure no violation of the assumptions of normality, linearity and homoscedasticity. No significant relationship was found between the two variables ($r = -0.05$, $n = 92$, $p > 0.05$).

Table 2 Pearson product-moment correlations between online TSE and the four scales

		Student Engagement	Instructional Strategies	Classroom Management	Computer Use	Total self-efficacy
Student Engagement	Pearson Correlation	1				
Instructional Strategies	Pearson Correlation	0.815**	1			
Classroom Management	Pearson Correlation	0.803**	0.872**	1		
Computer Use	Pearson Correlation	0.721**	0.853**	0.785**	1	
Online TSE	Pearson Correlation	0.896**	0.966**	0.938**	0.909**	1

** Correlation is significant at the 0.01 level (2-tailed)

Furthermore, independent samples t-tests reported a statistically significant difference at the $p < .05$ level in self-efficacy scores for receiving online instructional design support. Teachers who received online instructional design support scored significantly higher at their online TSE ($M = 7.57$, $SD = 0.99$) than the teachers who did not receive online instructional design support ($M = 6.91$, $SD = 1.25$; $t(91) = 2.70$, $p < 0.05$, two-tailed). Another significant difference was found for teachers who attended a seminar or course in online teaching who scored significantly higher ($M = 67.54$, $SD = 1.09$) than teachers who did not attend this course ($M = 6.96$, $SD = 1.05$; $t(91) = 2.33$, $p < 0.05$). No significant difference in self-efficacy was found between teachers who did receive peer/IT support or mentoring ($M = 7.47$, $SD = 1.06$) and teachers who did not receive this kind of support ($M = 7.24$, $SD = 1.16$; $t(91) = 0.97$, $p > 0.05$).

3.5.2 Qualitative findings

When described their feelings about the transition to the online learning, majority of teachers expressed their frustration and confusion, especially at the beginning of the transition. Participants' answers varied from describing the transition as "stressful; overwhelming due to large requirements; somewhat boring; fatigue; there is some tension when slowing down on the part of the learners; tiring and sometimes frustrating etc...". Despite that these teachers adapted very quickly to the transition, they did not know what to expect of this new experience. They were mainly concerned about "the preparation of their online lessons, organizing the lesson time and activities, and most of all missing the physical interaction with their students." Others were more positive and expressed their excitement to this new learning experience. These teachers were mostly from the same context (UAE) who explained the support of the school management and the technological trainings that they received as well as the availability of various online platforms that they can choose from and implement in their online classroom.

Some participants (60%) believed that the online learning would positively impact students' learning and this is because students are less distracted while others (40%) believed the opposite. In their opinion, k-12 teachers conveyed that "students are not being committed to the learning process, especially when there is no supervision at home or expected accountability from the student." One teacher from Oman mentioned "students are not taking the online learning seriously and as a result they are not participating in the online activities or discussions." As such, teachers believed that the online learning would never replace the face-to-face teaching inside a classroom environment. Also, they stated that "the parental support is vital for the success of the online learning". That is why, to ensure students' learning, teachers seek parents' involvement to encourage their children to attend and participate in class and submit their assignments on time.

When asked about the factors that would impact their online TSE, participants' answers to the open-ended questions revealed that they were expecting some hurdles to this unprecedented and sudden transition. These hurdles were mainly about: being unprepared to design online instruction, lack of familiarity with online educational applications and platforms, students' disengagement and classroom management, connectivity issues, and lack of technical support.

3.5.3 Unprepared to design online instruction

Teachers from Bahrain, Jordan, Lebanon, Oman, Saudi Arabia, and UAE struggled in designing the online lessons, worksheets, activities, and assessments. They reported that they were not prepared to adapt the curriculum to the online platform and had difficulties choosing the activity that would engage students and increase their motivation. One participant stated “the main obstacle or difficulty that I faced in the online teaching during COVID-19 was creating the online content and activities, keeping students interested with the course, and making sure they submit the required tasks.”

Teachers also struggled in differentiating the instruction and assigning tasks as per students’ learning needs and styles. One participant from the United Arab Emirates mentioned that “it was difficult for me to use the online forums to reach those children with learning difficulties or need additional support, or even to differentiate the learning as per students’ levels and capacities”. That is why participant teachers took a personal initiative to develop their technological competence by attending online workshops and watching online videos about the use and implementation of online platforms.

3.5.4 Lack of familiarity with online educational applications and platforms

Other factors that could have impacted teachers’ self-efficacy beliefs with their online teaching is their lack of familiarity with online educational applications and platforms (i.e., Microsoft Teams). Most of participants (87%) reported that they struggled with finding the right online applications to assess students’ learning. They relied mostly on multiple choice questions assessments and seeking for less detailed answers when evaluating students’ learning. Participants working hours and efforts doubled during the pandemic because they were not prepared for online teaching. As such and despite their personal efforts to look for online apps to deliver the online instruction, they rarely succeeded in finding the right tool to challenge students, keep them engaged, and increase their participation. To that extent, participant from Lebanon mentioned “I struggled in transmitting the information in a new way to students who were not used to it.” Participants from the UAE stated “I struggled in introducing new platforms to my students”, “I faced difficulty in preparing an online class mainly grappled with the various technologies and platforms as we are not used to it.”

3.5.5 Students’ disengagement and classroom management

Participants of this study reported students’ boredom and disengagement, especially in context like Saudi Arabia where both students and teachers had their cameras off.

Managing an online classroom was not an easy task for teachers. Many reported that they had to be patient and establish new rules for their online class. Others kept students busy by structuring group and pairs activities, using breakout sessions, and using interactive learning platforms. Participant from Oman said:

I expected that there will be a few hurdles as we let go of old classroom habits and explore new ways of managing virtual classes... to keep my students

interested in the course, I asked them to work together in small groups and independently to ensure that student's perceive online learning in a similar light to traditional schooling and make them more passionate and serious towards their learning.

3.5.6 Connectivity issues

Some of the participants (38%) conveyed their frustration regarding the instability of the internet connection which is significantly impacting the overall virtual teaching and learning environment. As teachers from Jordan, Lebanon and Saudi Arabia stated “I think that a serious effort should be done to resolve the electricity and WiFi connection problems”, “I do not have very high expectations because not all students were able to get connected to the online lessons”, “the main obstacles or difficulties that I faced during the transition to online teaching in COVID-19 was the internet dysconnectivity”, “Internet is not available for all students and the weakness of the connection made this experience bad”, “the technical difficulties during class instruction delayed the work.”

3.5.7 Lack of technical support

Due to the abundance of online platforms and tools, and teachers' and students' unfamiliarity with using these tools, k-12 teachers highlighted their need for more technical support to reduce their burden during the transition. As one teacher clearly stated “...this technical support is required at any time during and outside working hours and through phone calls as well.” Another teacher supported this previous message by saying “we (teachers) need urgent technical support quickly through phone calls to improve better communication.”

4 Discussion

The purpose of this paper was to explore the online TSE of 150 K-12 teachers from six Arab countries during COVID-19. Quantitative and qualitative data were collected and results revealed that perceived self-efficacy of online teaching was high. Two main factors, receiving online instructional design support and receiving professional development in online teaching, showed to significantly impact participants' self-efficacy beliefs and support the success of this transition. Qualitative data corroborated the quantitative results and showed that being unprepared to design online instruction was a main hurdle for teachers. This finding is aligned with the findings of Horvitz et al. (2014) explaining that when teachers are trained to design online instruction they succeed in delivering the content at the allocated lesson time. In addition, having the right skills to design online instruction enhanced teachers' capacities to design learning activities and increasing students' engagement with their learning (Hampton et al., 2020; Horvitz et al., 2014). As such, results of this study showed a strong correlation between teachers' instructional strategies with self-efficacy and

classroom management. Literature to date showed that designing appropriate instructions would raise students' self-efficacy in completing tasks which would improve the online teaching and learning environment. Raising the quality of the teaching and online environment would in return enhance teachers' confidence, motivation, and self-efficacy (Corry & Stella, 2018; Presno, 1998). One way to boost the quality of online learning environment is through preparing teachers with knowledge and skills in using the computer and technological resources. Having this knowledge lessened teachers' anxiety and increased their control over the virtual environment and ability to manage the online classroom (Robinia & Anderson, 2010). Furthermore, findings of this study revealed that teachers who have previous experience in online teaching scored significantly higher on their self-efficacy than teachers with limited or no experience. Having previous online teaching experience qualified teachers with the knowledge and skills to use online platforms and resources with the aim to increase students' motivation and engagement (Robinia & Anderson, 2010).

Student engagement had the weakest correlation between the four scales with the overall self-efficacy and was also reported as a concern in the qualitative analysis. As opposed to earlier evidence showing the positive correlation between teachers' self-efficacy and students' motivation and engagement (i.e. Lemon & Garvis, 2015; Tschannen-Moran et al., 1998;), teachers in the Arab world are still confused about ways to increasing students' engagement in the lesson and the extent that this would have on their online TSE. In the online learning environment, this type of barrier is considered far more fundamental to the success of the online teaching and to the perceived self-efficacy because it reflects teachers' beliefs and attitudes in technology adoption and how to integrate technology in the favor of engaging students (Ertmer et al., 2012; Schrum, 1999). That is why participants of this study revealed their need to be trained on selecting and integrating online educational applications and platforms to support their transition to technological environments and to enhance their teaching practices and pedagogies.

On the other hand, parental involvement was discovered through the qualitative analysis to be an emerging factor that could ensure the success of the online teaching and learning environment. Teachers revealed that engaging parents in the online learning is necessary to guarantee that students are always attending the lesson and they are physically there. This is mainly because in some contexts, students and teachers had their cameras off during the online teaching. This issue could have increased students' misbehavior, disengagement, and chance of withdrawing from the lesson without taking the teacher's permission to do so. Hence, teachers' overall experience during the online learning environment was negatively impacted which have had an influence on their confidence and self-efficacy levels. This interpretation is supported by the positive association between teachers' self-efficacy and their perceptions of the support they receive from parents (Stipek, 2012). Having a trusting and cooperative relationship with parents from one side and believing in the engaging role of parents in their children's learning from another side increased teachers' feelings of accomplishment and self-efficacy (Skaalvik & Skaalvik, 2010; Stipek, 2012).

5 Implications, recommendations and limitations

This study differs from earlier studies addressing self-efficacy in online teaching and learning context in a number of ways, and hence its importance could be summarized as follows. First, it adds to the body of literature addressing online TSE particularly amid the outbreak of COVID-19 pandemic. Second, it highlights ways to improve the online teaching and learning environment in the Arab world context where barriers could vary from electricity and internet interruption to the low quality of professional development offered to teachers (Baroudi & Rodjan Helder, 2019; Mahmood, 2020). Thirdly, this paper provides an understanding of predictors of online TSE, especially that literature remains ambiguous on whether online TSE increases with time spent teaching online and subsequent years of experience (Pressley, 2021). Lastly, the adapted scale can serve as an instrument for further research in the context of online teaching amid and beyond COVID-19 pandemic in the Arab world.

Curriculum designers and educational trainers can benefit from the results of this study by considering this knowledge in: (1) preparing teachers to design online instruction and online learning activities to increase students' engagement, (2) designing mentoring programs where "experienced" teachers with higher self-efficacy could be modeling online teaching and online classroom management and assessment to those who are less confident in their teaching, and (3) preparing teachers with the technological knowledge and skills in order to promote their attitudes and beliefs towards technology adoption in their instruction. Additionally, the positive correlation between years of online teaching experience and self-efficacy in general, and student engagement in specific, suggests that the online teaching experience is a strong predictor to boost teachers' confidence and ability to engage students in online learning despite the training they receive. This draws attention to the importance of providing adequate support to novice teachers so that they wouldn't drop out, and enhance gains in self-efficacy. Support may take several forms such as enrolling teachers in mentoring and coaching programs or designating experienced teachers to provide peer lesson observations.

Participants of this study showed high levels of self-efficacy in online teaching, yet, the most important additional research needed is how teachers are being supported and prepared to teach online. As a result of the positive correlation that self-efficacy has on teachers' well-being, job satisfaction, confidence, and performance (Ayllón et al., 2019; Hampton et al., 2020; Moore, 2005), this paper recommends researchers to examine the association of factors that were emerged from this study (i.e. cameras being turned off, parental involvement) with their perceived self-efficacy scores. Despite the contributions that this study offers, it has several limitations. Selecting a convenient sample limited the chance for participants to equally participate in the study and affected the generalizability of the results. Also, having no comparative group and the self-reported scores caused further limitations.

References

- Armor, D., Conroy-Oseguera, P., Cox, M., King, N., McDonnell, L., Pascal, A., & Zellman, G. (1976). *Analysis of the school preferred reading programs in selected Los Angeles minority schools*. Santa Monica, CA: RAND
- Ayllón, S., Alsina, Á., & Colomer, J. (2019). Teachers' involvement and students' self-efficacy: Keys to achievement in higher education. *PLoS One*, 14(5), 1–11
- Bandura, A. (1977). Self-efficacy: Toward a unifying theory of behavioral change. *Psychological Review*, 84, 191–215
- Bandura, A. (2001). Social cognitive theory: An agentic perspective. *Annual Review of Psychology*, 52, 1–26
- Bandura, A., & Locke, E. (2003). Negative self-efficacy and goal effects revisited. *Journal of Applied Psychology*, 88, 87–99
- Bao, W. (2020). COVID-19 and online teaching in higher education: A case study of Peking. *University Human Behavior & Emerging Technology*, 2, 113–115
- Baroudi, S., & Rodjan Helder, M. (2019). Behind the scenes: teachers' perspectives on factors affecting the implementation of inquiry-based science instruction. *Research in Science & Technological Education*, 1–22
- Bintliff, A. (2021). How COVID-19 Has Influenced Teachers' Well-Being. Retrieved from <https://www.psychologytoday.com/us/blog/multidimensional-aspects-adolescent-well-being/202009/how-COVID-19-has-influenced-teachers-well>. Accessed on August 10th, 2021
- Chang, T. S., Lin, H. H., & Song, M. M. (2011). University faculty members' perceptions of their teaching efficacy. *Innovations in Education and Teaching International*, 48, 49–60
- Corry, M., & Stella, J. (2018). Teacher self-efficacy in online education: a review of the literature. *Research in Learning Technology*, 26, 1–12
- Creer, T. L., & Wigal, J. K. (1993). Self-efficacy. *Journal of the American College of Physicians*, 103(5), 1316–1317
- Creswell, J. W. (2014). *Research design: Qualitative, quantitative, & mixed methods approaches* (4th ed.). Thousand Oaks, CA: Sage Publications
- Culp-Roche, A., Hardin-Fanning, F., Tartavouille, T., Hampton, D., Hensley, A., Wilson, J. L., & Wiggins, A. T. (2021). Perception of online teacher self-efficacy: A multi-state study of nursing faculty pivoting courses during COVID 19. *Nurse Education Today*, 106, 118–150
- Dogru, O. (2020). An Investigation of Pre-Service Visual Arts Teachers' Perceptions of Computer Self-Efficacy and Attitudes towards Web-Based Instruction. *International Journal of Research in Education and Science*, 6(4), 629–637
- Dolighan, T., & Owen, M. (2021). Teacher Efficacy for Online Teaching During the COVID-19 Pandemic. *A Journal of educational research and practice*, 30(1), 95–116
- Donnelly, D., McGarr, O., & O'Reilly, J. (2011). A framework for teachers' integration of ICT into their classroom practice. *Computers & Education*, 57(2), 1469–1483
- Dunbar, M., & Melton, T. D. (2018). Self-efficacy and training of faculty who teach online. In C. Hodges (Ed.), *Self Efficacy in Instructional Technology Contexts* (pp. 15–33). Zurich, CH: Springer Nature
- Ertmer, P. A., Ottenbreit-Leftwich, A., Sadik, O., Sendurur, E., & Sendurur, P. (2012). Teacher beliefs and technology integration practices: A critical relationship. *Computers and Education*, 59, 423–435
- Fraenkel, J. R., & Wallen, N. E. (2009). *How to design and evaluate research in education* (7th ed.). New York: The McGraw-Hill Companies, Inc
- Goddard, R. D., Hoy, W. K., & Hoy, A. W. (2000). Collective Teacher Efficacy: Its Meaning, Measure, and Impact on Student Achievement. *American Educational Research Journal*, 37(2), 479
- Hampton, D., Culp-Roche, A., Hensley, A., Wilson, J., Otts, J. A., Thaxton-Wiggins, A. & Moser, D. K. (2020). *Self-efficacy and Satisfaction With Teaching in Online Courses*. Nurse Educator. Publish Ahead of Print
- Hew, K., & Brush, T. (2007). Integrating technology into K-12 teaching and learning: Current knowledge gaps and recommendations for future research. *Educational, Technology Research and Development*, 55, 223–252
- Horvitz, B. S., Beach, A. L., Anderson, M. L., & Xia, J. (2014). Examination of Faculty Self-efficacy Related to Online Teaching. *Innovative Higher Education*, 40(4), 305–316
- Htang, L. (2018). Measurement of Teacher Sense of Efficacy: A Study with Myanmar In-service Teachers. *Journal of Education and Practice*, 9(35), 39–48.)

- Kissau, S., & Algozzine, B. (2015). The impact of mode of instructional delivery on second language teacher self-efficacy. *ReCALL*, 27(2), 239–256
- König, J., Jäger-Biela, D. J., & Glutsch, N. (2020). Adapting to online teaching during COVID-19 school closure: teacher education and teacher competence effects among early career teachers in Germany. *European Journal of Teacher Education*, 43(4), 608–622
- Korpershoek, H., Harms, T., de Boer, H., van Kuijk, M., & Doolaard, S. (2016). A meta-analysis of the effects of classroom management strategies and classroom management programs on students' academic, behavioral, emotional, and motivational outcomes. *Review of Educational Research*, 86(3), 643–680
- Lee, M. H., & Tsai, C. C. (2010). Exploring teachers' perceived self-efficacy and technological pedagogical content knowledge with respect to educational use of the World Wide Web. *Instructional Science*, 38, 1–21
- Lemon, N., & Garvis, S. (2015). Pre-service teacher self-efficacy in digital technology. *Teachers and Teaching*, 22(3), 387–408
- Li, C., & Lalani, F. (2020, April 29). The COVID-19 pandemic has changed education forever. This is how. World Economic Forum <https://www.weforum.org/agenda/2020/04/coronavirus-education-global-COVID19-online-digital-learning/>
- Ma, K., Chutiyami, M., Zhang, Y., & Nicoll, S. (2021). Online teaching self-efficacy during COVID-19: Changes, its associated factors and moderators. *Education and Information Technologies*, 1–23
- Mahmood, S. (2020). Instructional Strategies for Online Teaching in COVID-19 Pandemic. *Human Behavior & Emerging Technology*, 3, 199–203
- Merriam, S. B. (2009). *Qualitative Research: A Guide to Design and Implementation*. San Francisco: Jossey-Bass
- Moore, J. C. (2005). *The Sloan Consortium quality framework and the five pillars*. Newburyport, MA: The Sloan Consortium
- Philipsen, B., Tondeur, J., Pareja Roblin, N., Vanslambrouck, S., & Zhu, C. (2019). Improving teacher professional development for online and blended learning: a systematic meta-aggregative review. *Educational Technology Research and Development*, 67(5), 1145–1174
- Poulou, M., Reddy, L. A., & Dudek, C. M. (2018). Relation of teacher self-efficacy and classroom practices: A preliminary investigation. *School Psychology International*, 40(1), 25–48
- Presno, C. (1998). Taking the byte out of Internet anxiety: Instructional techniques that reduce computer/Internet anxiety in the classroom. *Journal of Educational Computing Research*, 18, 147–161
- Pressley, T. (2021). Returning to teaching during COVID-19: An empirical study on elementary teachers' self-efficacy. *Psychology Schools*, 58, 1611–1623
- Rasmitadila, R., Aliyyah, R. R., & Samsudin, A. (2020). The Perceptions of Primary School Teachers of Online Learning during the COVID-19 Pandemic Period: A Case Study in Indonesia. *Journal of Ethnic and Cultural Studies*, 7(2), 90–109
- Rice, K. L. (2006). A comprehensive look at distance education in the K-12 context. *Journal of Research on Technology in Education*, 38(4), 425–448
- Richter, S., & Idleman, I. (2017). Online Teaching Efficacy: A Product of Professional Development and Ongoing Support. *International Journal of Nursing Education Scholarship*, 14(1), 1–8
- Robinia, K. A., & Anderson, M. L. (2010). Online teaching efficacy of nurse faculty. *Journal of Professional Nursing*, 26, 168–175
- Schibeci, R., MacCallum, J., Cumming-Potvin, W., Durrant, C., Kissane, B., & Miller, E. (2008). Teachers' journeys towards critical use of ICT. *Learning, Media and Technology*, 33(4), 313–327
- Schrum, L. (1999). Technology professional development for teachers. *Educational Technology Research and Development*, 47, 83–90
- Skaalvik, E., & Skaalvik, S. (2010). Teacher self-efficacy and teacher burnout: A study of relations. *Teaching and Teacher Education*, 26, 1059–1069
- Stipek, D. (2012). Context matters: Effects of student characteristics and perceived administrative and parental support on teacher self-efficacy. *The Elementary School Journal*, 112(4), 590–606
- Suprayogi, M. N., Valcke, M., & Godwin, R. (2017). Teachers and their implementation of differentiated instruction in the classroom. *Teaching and Teacher Education*, 67, 291–301
- Toto, G. A., & Limone, P. (2020). Effectiveness and Application of Assisted Technology in Italian Special Psycho-Education: A Pilot Study. *Journal of e-Learning and Higher Education*, vol. 2020, 1–9
- Tschannen-Moran, M., & Hoy, A. W. (2001). Teacher efficacy: Capturing an elusive construct. *Teaching and Teacher Education*, 17, 783–805

Tschannen-Moran, M., Hoy, W. A., & Hoy, W. K. (1998). Teacher efficacy: Its meaning and measure. *Review of Educational Research*, 68(2), 202–248

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