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Examining elementary preservice teachers' self-efficacy and satisfaction in online teaching during virtual field experience

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Abstract: The global pandemic of COVID-19 has forced many learning institutions to close or switch to remote learning as a preventative measure to reduce the spread of the virus. The greatest challenge was with practical courses where pre-service teachers had to promptly acquire technological skills and online teaching pedagogies as part of their virtual field experience. This need for learning and applying online pedagogies and technological competencies to increase student performance can lead to different perceptions of self-efficacy in online teaching. The purpose of this study is to examine the predictors for enhancing preservice teachers' self-efficacy and satisfaction in online teaching and to investigate the association of their self-efficacy beliefs and their satisfaction with online teaching. Elementary preservice teachers (n = 257) from two teacher preparation programs in two universities in the United Arab Emirates completed a 5-point Likert scale survey. Results revealed that participants reported a high level of self-efficacy and satisfaction in online teaching mainly regarding their abilities to engage students in online classrooms and use of computers/educational technology. Students' technological knowledge was strongly correlated with participants self-efficacy beliefs. Interestingly, results showed that preservice teachers who have beginner experience in teaching scored significantly higher on their self-efficacy than those with moderate and advanced experience.

Subjects: Higher Education; Open & Distance Education and eLearning; Teachers & Teacher Education; Classroom Practice;

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Keywords: online self-efficacy; preservice teachers; field experience; teacher education programs; educational technology; digital literacy; online classroom management; online instructional strategies

1. Introduction

The coronavirus pandemic has interrupted school communities all over the world. Students and teachers experienced stress and faced many challenges during this time of uncertainty. Indeed, teachers have been forced to alter their instruction methods and curriculum content to distance learning and engage with students virtually. Little research has investigated teachers' self-efficacy in these challenging times. Teachers' beliefs in their ability to effectively handle the new situation play a key role in influencing important academic outcomes such as students' achievement and motivation (Barni et al., 2019). The challenge of doing something new comes usually with minimal confidence; hence, having to cope with a sudden transition to a new means of teaching/learning is overwhelming in most situations since online teaching and computer-based instruction are considerably different from face-to-face teaching/learning and require specific teacher training and preparation (Dolighan & Owen, 2021). It was also proven that teachers who are more likely to feel engaged with students and who try more creative strategies to teach students have a high level of self-efficacy (Ma et al., 2021).

Several studies showed the positive influence of teacher self-efficacy on their beliefs about teaching and job satisfaction (Baroudi & Hojeij, 2020; Jelinska & Paradowski, 2021; Shim et al., 2013; Skaalvik & Skaalvik, 2007; Tschannen-Moran & Woolfolk Hoy, 2001). Renner and Pratt (2017) argue from the New Zealand context that self-efficacy beliefs play a significant role in teachers' effectiveness and overall satisfaction and comfortability in doing their jobs. Instructors who are armed with self-efficacy set higher expectations for their students, are more positive and responsive and tend to provide their pupils with more support promoting a positive learning environment. This, in turn, has increased their job commitment and satisfaction levels. For teachers to be teaching effectively, self-efficacy has been proven to be essential since it influences their behavior inside and outside the classroom, especially when preparing educational material (Barni et al., 2019). Specifically, it has been proven that there is a link between technology use and integration in the classroom and teacher self-efficacy (Corry & Stella, 2018). In reality, scientific evidence revealed low online teaching self-efficacy at the beginning of the virtual teaching, mainly due to practitioners' lack of prior experience which affected overall performance (Ma et al., 2021). Hence, intervention programs could have a positive influence on improving the technological pedagogical content knowledge perception of both in-service and preservice teachers' self-efficacy for integrating technology into teaching (Dolighan & Owen, 2021). Furthermore, self-efficacy is positively correlated with students' academic performance; hence, self-efficacy was established to be a key element in performance and skills development (Romero-Tena et al., 2021).

Finally, Henry (2016) discussed the importance of mentorship in developing self-efficacy in beginner teachers. Other similar studies revealed that not only did self-efficacy develop through mentoring, but also previous work experiences, mentoring support from colleagues, and professional learning enhanced novice teachers' levels of self-efficacy. Dolighan and Owen (2021) discussed the importance of collegial collaboration among teachers and ongoing collaborative inquiry in having a positive association with the use of Information and Communication Technologies (ICT) in teaching. Fostering mentoring relationships and collegial support would specifically benefit novice teachers, who scored significantly low on their self-efficacy beliefs compared to their more experienced counterparts (Tschannen-Moran & Woolfolk Hoy, 2007).

Considering the aforementioned debates about teachers' self-efficacy beliefs and their effectiveness and satisfaction, it becomes significant to examine these for preservice teachers during their online teaching. With respect to the significance of teachers' online teaching self-efficacy on their performance, attitudes towards online teaching and improving students' performance

the results of this study are hoped to contribute to the body of literature that has mostly focused on the challenges faced by teachers during the shift to online teaching. Although many studies have been conducted, in an educational context, that support the positive impact of self efficacy of teachers on educational outcomes (Baroudi & Hojeij, 2020; Jelinska & Paradowski, 2021; Shim et al., 2013; Skaalvik & Skaalvik, 2007; Tschannen-Moran & Woolfolk Hoy, 2001), however to our knowledge no studies have yet investigated preservice teacher self efficacy, platform knowledge and job satisfaction, when teaching online in an Emirati context. Results from this study are especially important in order to pave the way for future college training programs to help train student teachers and prepare them for the working world. Hence, identifying the predictors for enhancing preservice teachers' self-efficacy and satisfaction with their online teaching is significant to create a framework for building a collaborative approach among teachers and their administrations. This approach is helpful particularly to inexperienced teachers who may have recently graduated with a teaching qualification and will be expected to teach effectively.

2. Theoretical framework

Bandura's theory of self-efficacy is at the core of the theoretical framework of this study. Bandura (1977) defines self-efficacy as the people's perception of their abilities to perform a task and execute it successfully. Bandura (1994, 1997) argued that self-efficacy is influenced by four fundamental factors: 1) Mastery Experience which influences self-efficacy. This occurs when a person attempts to do something and succeeds in it. That means the person has mastered the experience. According to Bandura (1994), mastery experience expands one's self-efficacy as it allows him/her to successfully do something new because it was similar to what he/she did before. This is related to this current study where preservice teachers were expected to approach virtual field experience with mastery as they had conducted face-to-face field experience with learners positively. Preservice teachers received support from their mentor teachers and university supervisors on how to conduct virtual field experience. This aligns with Bandura (1977) who argues that the provision of training sessions, support, and professional development opportunities help people obtain mastery experience in the self-efficacy theory. 2) Vicarious Experience is the second factor which influences self-efficacy. It involves observation of other people's successes and failures and learning from them. Observing someone conduct an experience you would like to have increases one's self-efficacy (Bandura, 1994). This is related to this study where preservice teachers observed their mentor teachers teach online and their fellow trainee teachers successfully complete virtual field experience. Preservice teachers learned from the experiences of the people they observed and that helped build their self-efficacy beliefs. 3) Verbal Persuasion is the third factor which impacts individuals' self-efficacy. This involves feedback on one's performance. Bandura (1977) states that when a person receives feedback and persuasion that s/he can complete a task, s/he is likely to gain encouragement and do the work successfully. This relates to this study where preservice teachers received continuous feedback from their mentor teachers and university supervisors about their performance in virtual field experience. The feedback, encouragement and support enabled preservice teachers to boost their self-efficacy beliefs and to complete their tasks successfully. 4) Emotional and Physiological States is the final factor that influences individuals' self-efficacy beliefs. The state that a person will be in at the beginning of an encounter is a great determinant of the success or failure of an experience (Bandura, 1994). That means, if a person feels anxious and discouraged and does not get the necessary support, s/he will likely fail in doing the task. In contrast, if a person feels motivated, eager to learn and gets support, s/he is likely to succeed at the task. This is related to this study where preservice teachers in the UAE reported to have mixed feelings about the unprecedented virtual field experience (Hojeij & Baroudi, 2021a). Some felt that they would not be able to complete the experience successfully as teaching young children online is not easy. Others felt they were ready for the challenge. The theory has been chosen as the most appropriate for this research as many studies showed the positive influence of field experiences on preservice teachers' perceptions of their

abilities, their knowledge, and their self-efficacy (Ak & Gökdaş, 2021; Cooper et al., 2020; Shelton et al., 2020).

3. Literature review

3.1. Preservice teachers' perceptions towards online teaching

Even before educational institutions pivoted away from face-to-face teaching due to the outbreak of the COVID-19 pandemic, university online coursework had been growing steadily. According to the National Center for Education Statistics, 43.1 % of undergraduate students enrolled in at least one online class during the year 2016 (Institute of Education Sciences, 2018). This marked an increase in online learning opportunities and blended learning models that have called for educators to adopt different teaching approaches and embed the emerging online technologies within their instruction. Similarly, teachers' education and preparation programs adapted these immediate changes within their curriculum in order to provide preservice teachers with knowledge and practices needed for both traditional and online teaching (Cooper et al., 2020; Hojeij et al., 2021b; Shand & Farrelly, 2018).

Needless to say, both students and teachers seem to find a greater value in face-to-face teaching due to a higher level of student/teacher interaction and communication (Ak & Gökdaş, 2021; Shand & Farrelly, 2018). When exploring preservice teachers' perceptions towards online teaching, Shand and Farrelly (2018) reported that they were demotivated to run online classes due to the longer time they needed to design their online pedagogy and to select the right technological platform for content delivery. While this has negatively impacted preservice teachers' attitudes, Cooper et al. (2020) revealed that they would still greatly benefit from the experience itself particularly in the development of their self-efficacy in teaching and technology integration. Being engaged in online teaching during their field experience, preservice teachers' self-efficacy increased when they experimented with technological tools to design student-centered activities and practices (Cooper et al., 2020; Hampton et al., 2020). Not only can virtual field experiences offer this exposure and experimentation with modern methods, but also Augmented Realities (AR) and Virtual Realities (VR) have been offered in some education courses to simulate real classroom environments thus offering preservice teachers the opportunities to engage in active learning and decision-making regarding their instruction (Figueroa-Flore & Huffman, 2020). Further to this, Roche and Rolland (2020) found that the implementation of 360° videos can immerse preservice teachers in real-life teaching and learning situations thus simulating virtual field experiences. The benefits perceived were more focused observations and substitutive immersion experiences (Roche & Rolland, 2020). Additionally, preservice teachers have reported better preparedness and enhanced confidence after being subjected to simulation classroom experience programs (Sasaki et al., 2020; Zolfaghari et al., 2020).

3.2. Teachers' self-efficacy beliefs in online teaching

Dolighan and Owen (2021) present many studies that worked on teacher self-efficacy and how it correlates with several academic elements such as student achievement and student engagement. It was confirmed that teachers with a strong sense of self-efficacy tend to do more planning and organization and are more willing to experiment with new methods to meet the needs of their students. They also established that skills necessary for teaching in the virtual environment are different from face-to-face instruction such as managing the online classroom, creating instruction for the online platform, motivating and engaging online students, and designing instruction in the online environment. In addition to these skills, Romero-Tena et al. (2021) propose the following characteristics as necessary for teachers to have in order to deal with the current situation. Teachers should be able to use digital technologies to improve teaching and to interact professionally with colleagues, students and family. Teachers must develop and identify good educational resources that suit students. In addition, they should know how to design, plan and implement the use of digital technologies in the different stages of the teaching/learning process (Dai et al., 2020). Finally, they should be able to empower students by promoting their active

participation in the learning process. Preservice teachers cannot build technological competencies and adopt these into their teaching practices if they are not exposed to do so throughout their teacher education courses (Doğru, 2020). Even if preservice teachers recognized the effectiveness and success of the technological tools at hand, it is important to prepare them to design online pedagogies and trust the adequacy of the technology in handling certain situations (Mei & Yang, 2021). It is equally important to take preservice teachers' perceptions and feedback into consideration regarding technology and the best practices of its use within their classroom (Juarez & Critchfield, 2021).

3.3. Factors that are associated with teachers' self-efficacy in online teaching

In their study, Klassen and Chiu (2010) concluded that there is little research on how the teaching context affects teachers' self-efficacy but they confirmed that teaching in elementary schools was linked to higher levels of self-efficacy for classroom management and student engagement. Moreover, Hung (2016) studied elementary and middle school teachers' readiness for online teaching. The study focused on four major factors: communication self-efficacy, institutional support, self-directed learning, and learning-transfer self-efficacy. The authors concluded that teachers with a master's degree reported higher communication self-efficacy and learning-transfer self-efficacy than did teachers with a bachelor's degree. The study also found that teachers with fewer teaching years reported higher communication self-efficacy. Additionally, higher self-directed learning was reported by educators with more experience, as measured by the number of years teaching (Dolighan & Owen, 2021). That being said, it becomes significant to highlight the influence of teachers' years of experience on their self-efficacy beliefs (Klassen & Chiu, 2010; Wolters & Daugherty, 2007).

Klassen and Chiu (2010) found that teachers' self-efficacy increases with experience for early and mid-career stage teachers and declines for teachers in the late-career stages. Their results also indicated the positive relationship between teachers' years of experience, student engagement, instructional strategies, and classroom management. Teaching younger children (in elementary grades) was linked with higher levels of self-efficacy for classroom management and student engagement. This could be because it is easy to manage classes with young children and the level of engagement is likely to be high as they learn through experiential learning and play. Besides, Horvitz et al. (2015) argued that teachers with prior experience in online teaching were more likely to report more motivation to teach online. In contrast, those without online teaching experience reported lower self-efficacy when they transitioned into online teaching (Ma et al., 2021). The major difficulties teachers would face are mainly anticipated difficulties with technology, loss of connection with students, insufficient understanding of online pedagogical knowledge, and time-consuming features of online teaching. Hence, these controversial arguments about self-efficacy and years of teaching experience indicate that this relationship differs in each context. Contextual factors, such as students' characteristics, play a significant role in determining the degree of associations between teachers' self-efficacy beliefs and its various predictors (Von Suchodoletz et al., 2018).

Furthermore, students' technological knowledge was also found to be a factor that either inhibits or facilitates preservice teachers' experience during online teaching. In particular, to the context of this study, the focus will be mainly on primary students. Although researchers have different views concerning online learning for children in primary schools, they generally agree that students have good technological knowledge as they use ICT at a young age (Ferri et al., 2020; Nugroho et al., 2020). Lu and Hao (2014, p. 9) concur that "with the spread of ICT to everyday life, children are learning how to use the internet at an earlier age" as they use it both for entertainment and educational purposes. Children's exposure to ICT at an early stage and their ability to navigate through different applications and learning platforms make it possible for online learning to occur as long as the teacher has effective digital literacy skills (Dai et al., 2020). Since the start of COVID-19 pandemic, when schools were forced to close and implement online learning, children in some contexts, for example, the Bahamas had successful online learning experiences as they

had technological knowledge and adequate support from teachers (Nugroho et al., 2020). Similarly, in the Indonesian context, Rasmitadila et al. (2020) argued that students had successful online learning experiences because of their readiness to use technology and the way they worked collaboratively with teachers and other key stakeholders. Their finding is different from Ferri et al. (2020) who contended that teachers' and students' lack of technological knowledge were among the leading pedagogical challenges which were faced during online learning. Lack of technological knowledge among students was cited as the main reason why Chinese parents disliked online learning for their children in early childhood (Dong et al., 2020). Parents had to do extra work to try and assist their children with setting up devices so that they could attend lessons with the teacher. This is why The World Bank (2020) states that online learning is not ideal for young students as they lack comprehensive technological knowledge and most of them depend on caregivers for support. Some caregivers may be working which makes online learning difficult to implement with children who have limited digital skills.

3.4. Contextual factors impacting teachers' satisfaction in online teaching

Recent studies in the Arab world highlighted an additional obstacle hindering teachers' satisfaction and overall experience in online teaching. In line with the cultural norms and practices, Arab female teachers and their students usually turn off their cameras during online teaching. In their framework for preparing preservice teachers for online instruction, Hojeij and Baroudi (2021a) revealed the controversial impact of this situation on the teaching and learning process. Female preservice teachers were not able to see students' facial expressions and as such they couldn't assess if students understood the content. They felt more confident when the camera was closed because they were shy to teach knowing that the parents might be present during the lesson. Hence, Hojeij and Baroudi (2021a) highlighted the need to 1) prepare novice teachers with skills to create online lessons and activities, and 2) enhance their capacities to manage students' behavior in online learning. Doing so would increase preservice teachers' self-confidence and satisfaction in online teaching. Furthermore, it was argued that teachers' satisfaction with online teaching is increased when supported by school policies and when the material can be sent to students in a timely manner. At the same time, developing appropriate teaching evaluation systems and training the teachers to better grasp the technological platforms are key factors in enhancing educators' self-efficacy and hence confidence (Dai et al., 2020).

The role of mentors during the field experience is core to the success of preservice teaching experience as they serve as role models and contribute to the development of teaching behaviors and approaches (Carver & Feiman-Nemser, 2009). Mentors supervise novice teachers when designing and integrating standard-based lesson plans in order to meet students' learning needs. Furthermore, they guide preservice teachers with the school norms and expectations and ensure that preservice teachers are engaged in opportunities that would help them develop pedagogical knowledge, and classroom management and teaching experience (Carver & Feiman-Nemser, 2009). Thus, in a recent literature review about the quality of mentors, Ellis et al. (2020) identified that mentors should build strong relationships with preservice teachers and initiate conversations and discussions that would enrich preservice teachers' knowledge. Additionally, they concluded that a quality mentor should develop a professional knowledge in mentoring, support the preservice teachers to nurture a teacher-identity, and help them to relate learning to teacher professional standards (Ellis et al., 2020). In the Gulf region, there has been a challenge for novice teachers to apply what they learned in their teaching preparation programs to the classroom and failed to engage students in their learning (Hamdan, 2015). That is why, preservice teachers in the UAE reported that the role of mentors is crucial to their transition to the teaching profession, in particular, when mentors observe and give them feedback about their teaching practice and support them in the development of lesson plans and differentiated instructional activities. Mentors guide them to follow student centered approaches in order to increase students' interaction and engagement (Hojeij et al., 2021b). Hence, it is important for mentors to build strong

relationships and trust with preservice teachers to enhance the overall quality of the field experience and promote preservice teachers' performance (Hojeij et al., 2021b).

Due to the aforementioned associations between self-efficacy and teachers' effectiveness and satisfaction from one side and lack of studies that looked at self-efficacy in times of crisis specifically in the Arab context from the other side, this study aims to examine the predictors for enhancing preservice teachers' self-efficacy and satisfaction in online teaching during their virtual field placement. It also aims at investigating the association of their 1) use of computers, 2) instructional strategies, 3) classroom management, and 4) ability to engage students with their self-efficacy beliefs. This study will also investigate the impact of having mentors' support, students' technological knowledge, and the fact that the cameras during the online teaching were turned off, on participants' self-efficacy beliefs and overall satisfaction with their virtual field experience.

3.5. Research questions

RQ1. What are the dimensions of preservice teachers' self-efficacy in online teaching?

RQ2. What is the association between participants' teaching experience and age with their overall self-efficacy in online teaching?

RQ3. What factors can enhance preservice teachers' perceived self-efficacy?

RQ4. What is the relationship between preservice teachers' satisfaction and dimensions of online self-efficacy?

RQ5. What factors impact preservice teachers' satisfaction in online teaching?

4. Methodology

4.1. Context

The current study was conducted in two teacher preparation programs in two federal universities in the UAE. Preservice teachers are required to complete 120 credits over a period of eight consecutive semesters and participate in four teaching practice placements in their last four semesters. This study focused on the last field placement in semester eight where preservice teachers are placed in public and private schools for full-time teaching practice at the elementary level under the supervision of mentor teachers who are the actual classroom teachers. These mentors are chosen by the schools based on their teaching experience and qualifications and approved by the university. Mentors assign the lessons to teach for preservice teachers, observe them in action, conduct daily briefing sessions to discuss and reflect on the day. The faculty supervisor who is the course professor is also involved in this field experience. They observe preservice teachers in action and track their performance. They work hand in hand with mentors to ensure that preservice teachers are receiving quality field experience.

4.2. Research design

This study followed a cross-sectional survey design with a quantitative approach to explain the phenomenon and interpret relationships among the variables (Creswell, 2014). This design is useful because it helps researchers answer the research questions and identify attributes using a small population sample (Creswell, 2009). This design is the optimal research method for explaining the variables that mostly predict teachers' self-efficacy in an online setting and for investigating the extent that mentors' support, students' technological knowledge, and having the cameras turned on are associated with their perceived self-efficacy and overall satisfaction with their virtual field placement.

4.3. Participants and procedures

For this research, a total of 350 Emirati female preservice teachers, who conducted their field experience online during Covid-19, from two teacher education programs based in two federal universities in the United Arab Emirates (UAE) were selected. Out of the 350 surveys that were emailed to them, 257 responded back reflecting a response rate of 73%. The age of 67% of preservice teachers ranged between 21 and 25 years old. 23% of the teachers were between 18 and 20 years old, 7 % were between 26 and 30 years old, and only 3% of were above 30 years old. 44% of the participating teachers had a beginner level teaching experience whereas 34% had a moderate level and 22% had an advanced level. After receiving the Institutional Review Board (IRB) approval from the two participating universities, the researchers asked the faculty and instructors, who were teaching the field experience courses, to send the survey link to their students. A consent preamble was added before the start of the survey to ensure the confidentiality of data collected and the anonymity of participants. Neither the participating universities nor the identity of participants was documented in this study. The main researcher retained sole access to the research data and stored the data in an encrypted and password-protected file on her personal computer.

4.4. Instruments

The instrument used in this study consists of two parts. Part one is based on the revised version of the Teachers' Sense of Efficacy Teaching Scale originally developed by Tschannen-Moran and Woolfolk Hoy (2001) and revised by Robinia and Anderson (2010). The purpose of this scale was to understand how teachers judge their capabilities and confidence to teach online, and was divided into four categories: 1) self-efficacy in online student engagement, 2) self-efficacy in online instructional strategies, 3) self-efficacy for online classroom management, and 4) self-efficacy in the use of technological resources. In this current study, we used these dimensions but modified the items to fit the context of the study and the nature of the preservice teachers' role in the field placement. For example, this item in the original survey "How much can you do to get students to follow classroom rules?" was changed to "During the online teaching placement, I established class rules with students in my online classes." As such, the first part of the survey (18 items) and the second part (12 items) were piloted on a sample of 25 preservice teachers to determine the reliability and internal consistency of each factor. As a result, one item from part 1 "During the online teaching placement, I did not experience difficulties supporting students' learning online" was excluded because it did not have positive correlation above 0.4. Internal consistency of factors of the modified version of the instrument revealed good reliability among the four dimensions: self-efficacy in online student engagement (4 items, $\alpha = .796$), self-efficacy in online instructional strategies (5 items, $\alpha = .76$), self-efficacy for online classroom management (4 items, $\alpha = .781$), and self-efficacy in the use of computers (4 item, $\alpha = .782$).

Three more categories were added to the scale to examine their association with the reported self-efficacy scores and overall satisfaction: category 1- mentors' support, category 2- cameras being turned on during the online teaching, and category 3- students' technological knowledge. This is the second part of the survey. These categories were previously identified by Hojeij and Baroudi (2021a) to impact preservice teachers' teaching practices, classroom management skills, and the use of online resources during their online field experience in the UAE. Internal consistency of these items was: mentors' support (4 items, $\alpha = .748$); cameras being turned on (5 items, $\alpha = .728$); and students' technological knowledge (2 items, $\alpha = .752$). One question was added at the end of the survey to measure participants' overall satisfaction during the virtual field experience. As such, participants answered a total of 29 questions and marked their answers on a 5-point Likert scale ranging from strongly agree to strongly disagree (see Appendix A for the survey).

4.5. Results and data analysis

The Statistical Package for the Social Sciences (SPSS) version 28 was used to analyze the data collected. Both descriptive and inferential analysis were computed to extract mean, average, standard deviation and to look for statistical differences and correlations among variables. On

Table 1. Total mean score of each dimension of the online self-efficacy

Variable	Mean	Std. Deviation	Minimum	Maximum
Online Instructional Strategies	4.10	.70	1.40	5.00
Online Classroom Management	4.00	.73	1.00	5.00
Use of educational technologies	4.20	.68	1.50	5.00
Student Engagement in online classroom	4.40	.67	1.00	5.00

For observed means, 1 = Strongly Disagree, 2 = Disagree, 3 = Neutral, 4 = Agree, 5 = Strongly Agree

a 5-point Likert scale the results showed that preservice teachers have high levels of self-efficacy (Total Mean = 4.2 SD = 5.9). Looking into the significance level of each of the self-efficacy dimensions, results were in favor of the online classroom management and student engagement in an online setting. Table 1 represents the Mean and SD of each dimension of the self-efficacy.

A one-way between-groups analysis of variance was conducted to explore the association between the independent variables and preservice teachers' self-efficacy beliefs. Participants were divided into four groups according to their age (Group 1:18 and 20 years old, Group 2: 21 and 25 years old, Group 3: 26 and 30 years old, and Group 4: above 30 years old). There was a statistically significant difference at the $p < .05$ level in self-efficacy for the four age groups: $F(3, 253) = 3.07$, $p = .02$. Despite reaching statistical significance, the actual difference in mean scores between groups was quite small. The effect size, calculated using eta squared, was .04. Post -hoc comparisons using the Tukey HSD test indicated that the mean score for Group 1 ($M = 4.0$, $SD = .57$) was significantly different from group 2 ($M = 4.24$, $SD = .58$). Furthermore, participants were divided into three groups according to their level of teaching experience (Group 1:beginner, Group 2: moderate, and Group 3: advanced). There was a statistically significant difference at the $p < .01$ level in self-efficacy scores for the three groups: $F(6, 250) = 4.86$, $p < .01$. The actual difference in mean scores between group 2 with both group 1 and 3 was large which also explains the large effect size, calculated (eta squared = .10). Post -hoc comparisons using the Tukey HSD test indicated that the mean score for Group 1 ($M = 4.3$, $SD = .53$) was significantly different from group 2 ($M = 3.94$, $SD = .58$), and group 2 was significantly different than group 3 ($M = 4.2$, $SD = .59$).

Standard multiple regression analysis was conducted to investigate which of the variables included in the model contributed to the prediction of teachers' online self-efficacy. Results showed that the model containing Online Instructional Strategies, Online Classroom Management, Use of educational technologies, and Student Engagement in online classroom explains 95% of the variance in the perceived self-efficacy. Student engagement (beta = .33) and use of educational technologies (beta = .30) made significant contributions to explaining the dependent variable. The Beta value of Online Classroom management (beta = .24) and Online Instructional Strategies (beta = .21) made less of a statistically significant contribution.

Similarly, we checked the extent that the model consisting of Mentor's Support, Student Technological Knowledge and Cameras being turned on can contribute to the prediction of teachers' online self-efficacy. We found that this model explains 91% of the variance on the perceived self-efficacy. Of the three variables, Students' Technological Knowledge made the largest significant contribution (beta = .40) to the dependent variable followed by Cameras being turned on (beta = .38) and mentors' support (beta = .33).

The relationship between participants' perceived self-efficacy and overall satisfaction with their virtual field experience was investigated using Pearson product-moment correlation coefficient. Preliminary analyses were performed to ensure no violation of the assumption of normality, linearity, and homoscedasticity. There was a strong correlation between the two variables, $r = .75$, $n = 257$, $p < .001$. Participants' overall satisfaction with their virtual field experience (M = 4.23, SD = .88) helps to explain nearly 52% of the variance in respondents' scores on their perceived self-efficacy.

Correlation analysis was performed to look at how the different dimensions of online self-efficacy and the additional variables (students' technological knowledge, mentors' support, and cameras being turned on) correlate with participants' satisfaction with their online teaching. Pearson correlation coefficient results presented in Table 2 showed a high significant positive correlation with all dimensions, particularly, preservice teachers' ability to design online instructional strategies (r = .715, $p < .001$) had the strongest correlation with their satisfaction with online teaching while mentors' support had the lowest correlation (r = .583, $p < .001$). Mentors' support had also the lowest correlation with online instructional strategies (r = .661, $p < .001$), online classroom management (r = .563, $p < .001$), and student engagement in online classroom (r = .703, $p < .001$). Having the cameras on during the online teaching was strongly correlated with students' engagement in online classroom (r = .739, $p < .001$) and lowest correlation with students' technological knowledge (r = .553, $p < .001$). It is also noteworthy to mention that preservice teachers' skills and knowledge in the use of educational technologies were strongly correlated with their ability to design instructional strategies (r = .767, $p < .001$), online classroom management (r = .716, $p < .001$), and student engagement in the online classroom (r = .798, $p < .001$).

5. Discussion

This study explores the predictors for online teaching self-efficacy among preservice female teachers during COVID-19. During their virtual field placement, preservice teachers reported high scores on their self-efficacy levels and also on their satisfaction with their online teaching. A main

Table 2. Association of online self-efficacy, mentors' support, students' technological knowledge, and cameras being turned on with participants' satisfaction with online teaching (n = 257)

Variables	1	2	3	4	5	6	7	8
1.Online Instructional Strategies	1							
2.Online Classroom Management	.683**	1						
3.Use of educational technologies	.767**	.716**	1					
4.Student Engagement in online classroom	.769**	.667**	.798**	1				
5.Students' technological Knowledge	.668**	.674**	.742**	.725**	1			
6.Mentor's support	.661**	.563**	.710**	.709**	.615**	1		
7.Camera's being turned on	.692**	.663**	.703**	.739**	.553**	.671**	1	
8.Satisfaction with online teaching	.715**	.684**	.639**	.685**	.595**	.583**	.632**	1

For observed means, 1 = *Strongly Disagree*, 2 = *Disagree*, 3 = *Neutral*, 4 = *Agree*, 5 = *Strongly Agree*

strength of this study is that it is one of the few studies conducted in the context of online teaching for preservice teachers in the Arab world context. Overall, the findings of this study indicate that online teaching self-efficacy of preservice teachers and their satisfaction during the virtual field placement were strongly correlated. In particular, preservice teachers' ability to design online instructional strategies had the strongest correlation with their satisfaction with their online teaching. Our findings are in line with the results of Dai et al. (2020) suggesting that when teachers were trained on the digital platforms, both their ability to design online instruction and their self-efficacy beliefs improved. Further statistics showed that participants' abilities to engage students in the online classroom, the use of computers/educational technology, and students' technological knowledge were strongly associated with their self-efficacy beliefs in online teaching. In the field of Education and Information Technologies, building interaction with students and increasing their engagement and participation during online instruction is a key concern for researchers and practitioners (Robinson & Hullinger, 2008). As a solution, it is argued that increasing both novice and experienced teachers' online teaching experience and equipping them with technological competencies would increase their capacity to involve and engage students' engagement in a virtual environment (Dai et al., 2020; Ma et al., 2021; Maksimović & Dimić, 2016; Murati & Ceka, 2017). Teachers who succeed in engaging students in their learning- face to face or online- accomplish a greater sense of job fulfillment and satisfaction. It also impacts their commitment and in turn their ability to perform their job even during the most challenging situations. Hence, teachers' emotional state is indeed a great determinant of their success or failure and which would also be associated with their self-efficacy beliefs (Bandura, 1994).

Interestingly, results of this study showed that preservice teachers who have beginner experience in teaching scored significantly higher on their self-efficacy than those with moderate and advanced experience. This is not a common phenomenon among practitioners. Usually, a lack of prior teaching experience affects overall performance and online teaching self-efficacy (Ma et al., 2021). This study's outcome is not in line with a prior finding, which indicates that more experience in teaching is correlated with teachers' self-efficacy beliefs (Klassen & Chiu, 2010). Studies focusing on online teaching should be investigated and are thus far lacking. Not only that but previous studies showed that contextual factors play a significant role in determining the degree of associations between teachers' self-efficacy beliefs and its various predictors (i.e. teaching experience; Von Suchodoletz et al., 2018). An alternate explanation for this could be that preservice teachers in the UAE were more likely to be threatened by the anticipated challenges in online teaching and the fact that they have yet to develop technological knowledge required for adapting to the online teaching, rather than the existence or lack of teaching experience (Lee & Tsai, 2010). These arguments could be further investigated to shape a solid understanding of teachers' sense of self-efficacy in the UAE.

Furthermore, in the context of this study, variables such as mentors' support, student technological knowledge and cameras being turned on were also associated with preservice teachers' online self-efficacy. Of the three variables, elementary students' technological knowledge made the largest significant contribution to the dependent variable followed by cameras being turned on and mentors' support. This finding clearly suggests that students' lack of technological knowledge remains, and in line with previous studies (Dong et al., 2020; Ferri et al., 2020), a key concern for students and teachers during online learning. It also supports The World Bank (2020) statement that online learning is not suitable for young learners who lack comprehensive technological knowledge and which would bring detrimental consequences to their academic achievement. Hence, it could be argued for curriculum designers and school leaders to make ICT exposure a priority for improving digital literacy at early stages.

A key fact from the findings of this study was the low association of mentors' support towards enhancing preservice teachers' self-efficacy and satisfaction in online teaching. Surprisingly, mentors' support had also the lowest correlation with participants' ability to design online instructional strategies, online classroom management, and students' engagement during the online teaching. This finding

clearly contradicts previous findings in the literature highlighting the significance of mentors' support on the effectiveness of preservice teachers (Bandura, 1994). Despite that, the relationship between receiving mentors' support and teachers' self-efficacy (as in Mastery Experiences, Vicarious Experience, Verbal Persuasion) plays a significant role in the online teaching environment, mentors' support in the context of this study did not serve this role. In online instruction, however, preservice teachers' skills and knowledge in using educational technologies was identified as a foremost predictor to increasing online teaching self-efficacy and satisfaction in online teaching. Hence, literature suggests that professional development programs for both, in-service and preservice teachers, should strongly focus on developing their technological knowledge and how to use and integrate the right technology with their pedagogical content which would shape their perception of online teaching (Hojeij et al., 2021b). Doing so is a sure way to enhance their competencies in designing instructional strategies, improve students' engagement and ensure effective online classroom management (Dolighan & Owen, 2021); which would eventually lead to an increase in their self-efficacy beliefs and satisfaction in online teaching.

Finally, having the cameras on during the online teaching was strongly correlated with students' engagement in the online classroom. This finding suggests that while Emirati female teachers prefer having their cameras off to protect their privacy (Hojeij & Baroudi, 2021a), having the cameras on would have actually increased their ability to engage students. This is due to the age level of students (4 to 10 years old) who tend to become unmotivated if looking at a dark screen during the whole lesson (Will, 2020).

6. Implications, recommendations, and limitations

Findings of this study suggest that while teachers' self-efficacy might be reduced due to the difficulties they place when trying to engage young students in their learning, and managing and supervising them, and to their workload in designing online instruction, it becomes significant educational policymakers, mentors and faculty are called upon to revisit the structure of teacher preparation courses and assignments and make this learning journey less challenging for them. For instance, providing preservice teachers with real-life teaching and learning situations through simulating virtual field experiences could increase their preparedness and confidence and reduce any worries and challenges that they might face during online teaching (Roche & Rolland, 2020; Sasaki et al., 2020; Zolfaghari et al., 2020).

Furthermore, since equipping teachers with technological knowledge and skills was correlated with their online teaching self-efficacy and satisfaction in online teaching, curriculum designers in teacher preparation programs are recommended to create courses that could prepare teachers and increase their familiarity with the educational technologies. Doing so would ensure that teachers are integrating educational technologies apps and online games that not only serve in delivering the content, but also in building up positive teacher-student relationships and engaging students in online discussions (Sharma, 2017).

This study, however, was limited to one data collection method (surveys). Triangulating the data whether by collecting qualitative responses or surveying the same participants at a different point in time could have increased the reliability of results (Creswell, 2014). More limitations could result from the non-random sampling technique used and homogeneity of participants (all female from the UAE) which could threaten the generalizability of results and representation of the population. Additionally, measuring participants' satisfaction was assessed using only one item. Further research is recommended to examine this variable by using a reliable and valid instrument to obtain baseline data of participants' satisfaction with online teaching.

7. Conclusion

This study contributes to the body of literature by providing initial evidence on online teaching self-efficacy and satisfaction among elementary preservice teachers, particularly during a pandemic. Based on the findings of this study, it was concluded that preservice teachers' online teaching self-efficacy and satisfaction were high among Emirati preservice teachers during school lockdown due

to COVID-19. While the use of computer and educational technologies, students' technological knowledge and students' engagement were strongly correlated with participants' online teaching self-efficacy beliefs, designing online instructional strategies played a significant role in increasing their satisfaction with their online teaching. Lastly, it is worth noting that while having the cameras off during online instruction, in line with the cultural norms of the context, having them turned on would have ensured higher student engagement and interaction that would in turn have an impact on preservice teachers' self-efficacy beliefs and satisfaction.

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Appendix A: Survey

Part 1: Teachers self-efficacy in online teaching

Dimension 1: self-efficacy in online student engagement

(1) During the online teaching placement, I managed to create interactive online activities

(2) During the online teaching placement, students were engaged in the lesson because of the technology I used

(3) During the online teaching placement, the usage of online platforms and interactive

(4) During the online teaching placement, students enjoyed online games I used while teaching

Dimension 2: self-efficacy in online instructional strategies

(5) During the online teaching placement, I managed to design good lesson plans for online teaching

(6) During the online teaching placement, I was able to change my teaching methods to help students who are struggling with online learning

(7) During the online teaching placement, I was able to differentiate students' assessment

(8) During the online teaching placement, it was easy for me to use different student-centered online activities in my classes

(9) During the online teaching placement, I was able to give individualized feedback to students through the use of technology

Dimension 3: self-efficacy for online classroom management

(10) During the online teaching placement, it was easy for me to manage students' group activities online

(11) During the online teaching placement, I established class rules with students in my online classes

(12) During the online teaching placement, I managed students' online behavior successfully

(13) During the online teaching placement, I limited students' control to the meeting apps and features to ensure that they won't disrupt the lesson

Dimension 4: self-efficacy in the use of technological resources/computers

(14) During the online teaching placement, I used different technologies to teach (i.e. Kahoot, PowerPoint, Padlet, Google, animated videos, Century learning, etc.)

(15) During the online teaching placement, I used both synchronous and asynchronous teaching strategies

(16) During the online teaching placement, using online platforms (i.e, Microsoft Teams, Edmodo, Kahoot, Nearpod, etc.) helped me identify students' weaknesses

(17) During the online teaching placement, I used different technology tools (i.e. Class Dojo, Microsoft teams, Seasaw, Edmodo, etc …) to help me with classroom management

Part 2: Mentors support, cameras being turned off, and students' technical knowledge

Mentors' support

(18) During the online teaching placement, my mentor was very supportive in my online teaching

(19) During the online teaching placement, there was a strong online communication with my mentor

(20) During the online teaching placement, the feedback I got from my mentor was helpful towards my online teaching

(21) During the online teaching placement, I depended on my mentor to model how to teach children online

Cameras being turned off during the online teaching

(22) During the online teaching placement, I could connect and build rapport with students even if our cameras were turned off

(23) During the online teaching placement, having students' cameras turned off did not impact my overall teaching experience

(24) During the online teaching placement, having my camera turned off made me more confident in teaching online

(25) During the online teaching placement, having my camera turned off made me comfortable while teaching online

(26) During the online teaching placement, I could assess students' understanding even if I could not see their faces

Students' technological knowledge

(27) During the online teaching placement, it was easy for students to access the online platform and activities

(28) During the online teaching placement, it was easy for my students to access the online classroom

Participants satisfaction with their virtual field experience

(29) Overall, my experience in online teaching placement was positive

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