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Article

Preservice Teacher Perceptions of the Online Teaching and Learning Environment during COVID-19 Lockdown in the UAE

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Abstract: (1) Background: In March 2020, the United Arab Emirates Ministry of Education (MoE) closed all schools and universities in response to the global COVID-19 pandemic. All lessons had to be delivered online. This mixed methods case study explores responses to this change in learning environment from 35 BA Education and Early Childhood Studies preservice teachers at a British university in Dubai. The research sought to understand the impact of the sudden move to home learning and the ways in which it affected student communities alongside student perceptions of the online learning environment. (2) Methods: Quantitative data was collected via questionnaires allowing students to consider past experiences while reflecting on their approaches to the online environment. Weekly focus groups were held online to track the student experience and understand the influence of different pedagogical approaches. (3) Results: The research found most students maintained a ‘deep’ or ‘strategic’ approach to learning. (4) Conclusions: Despite students declaring the period of emergency online learning as successful, there was a strong preference for the traditional lecture format over alternative approaches, stating subjective feelings of belongingness and connectedness to the physical campus.



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Keywords: e-learning; COVID-19; distance learning; preservice teachers; learning environments; higher education; belongingness

1. Introduction

Due to the COVID-19 pandemic, in March 2020, all schools and universities in the UAE closed [1]. All teaching and learning in Higher Education moved online, with resources moved to digital learning platforms and lessons conducted via video-conferencing software. With first-rate education system being a priority of the UAE’s national agenda [2], there appeared an immediate obligation to understand the impact of this shift in learning on teacher education programmes. It was anticipated that preservice teacher experience of the emergency online learning environment would impact their perceptions of e-learning. Teachers’ prior involvement with e-learning technology is pertinent as students could influence their opinions regarding the potential value for learning, future adoption, and use of e-learning technology as pedagogical tools [3]. Over the last twenty-five years, the advances and reliance on technologies for educational evolution is demonstrated by an increased amount and variety of research publications on education with technological themes [4]. Consequently, the increasing reliance on educational technologies has a critical association with preservice teacher perceptions of e-learning technologies. Investigating preservice teacher perceptions of the e-learning environment could inform educators on the best ways to design and implement e-learning, and help to ensure high quality higher education for future students.

1.1. Promoting High Quality E-Learning

To understand the influences on high quality learning, Hounsell and colleagues [5] conducted a three-phase large scale project on Teaching–Learning Environments (TLEs) in higher education. Project outcomes included the heuristic Concepts Related to the Quality of Learning at University model of multifaceted entities that influence student learning [6]. The model provides opportunities to further explore the TLEs created online from multidimensional perspectives, considering aspects such as teacher influence, the students' previous experiences and student perception of teaching. Within an online environment, the quality of learning achieved is influenced by six integrated factors (Figure 1) which have been adapted for this study to incorporate the format of the online lesson, approaches to remote learning and studying, and student perceptions of online TLEs.

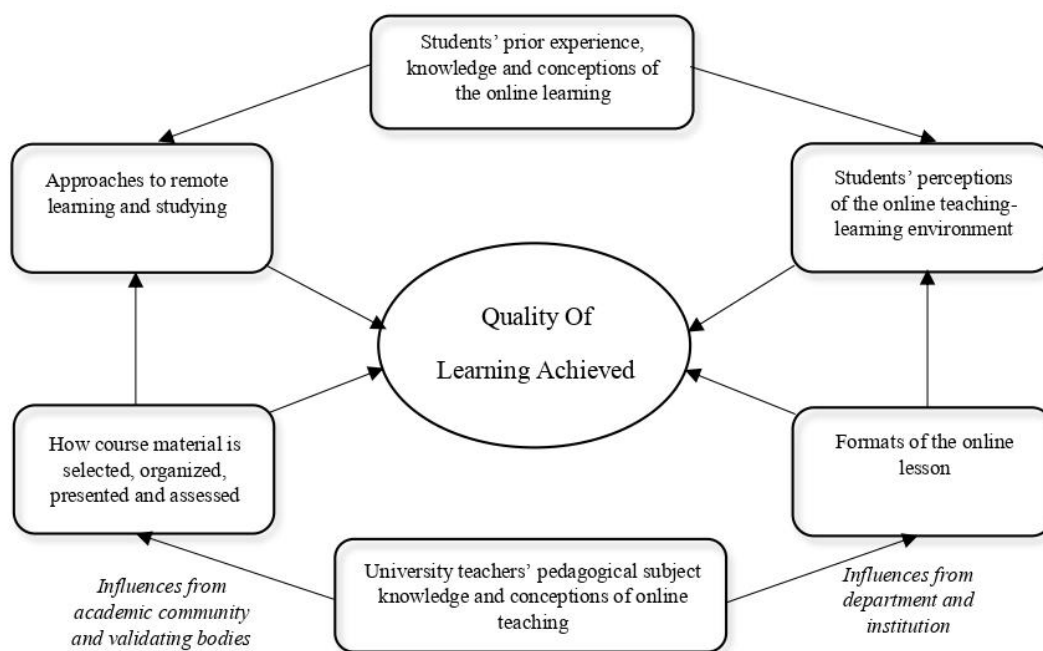


Figure 1. Concepts Related to the Quality of Learning at University. Adapted from Entwistle et al. [7].

1.2. Student Perceptions and Approaches to Learning

Previous research has suggested that perception of the learning context is key to understanding the quality of learning at university [7]. Hounsell and colleagues [5] assert that these perceptions affect student learning more directly than the methods of learning themselves [6]. Student learning approaches, both past and current, would influence and be influenced by perceptions of the learning environment. These student learning approaches are broadly defined as ‘deep’, ‘surface’, and ‘strategic’. The strategic approach was conceptualised to account for students’ organisation and effort management throughout their learning [6]. Findings suggest that a deep learning approach is linked to a positive learning experience and a surface learning approach is linked to a more negative learning experience [8–13].

1.3. Student-Teacher Technology Adoption

Carrillo and Flores’ [14] review of the literature of COVID-19 and teacher education examined emergency practices to inform future successful online teaching and learning delivery. Within the syntheses of works, preservice teacher perceptions of online learning environments and subsequent teaching–learning process outcomes developed reoccurring emergent themes. Research from Masoumi [15] suggests that integrating learning technology into trainee education programmes can determine preservice teachers’ own use of Information Communications Technology (ICT), subsequently impacting the ways in which

they develop young children's own digital capacities. The process of reflection allows student teachers to develop competences to craft quality online teaching and learning through exposure to the potential uses alongside conscientious instructional design and planning [16].

The Technology Acceptance Model (TAM) [17] is one of the most popular models to explain how and why people intend to use technology, hypothesising that Perceived Usefulness (PU) and Perceived Ease of Use (PEU) are the main determinants for current use of technology, with PEU impacting PU [17,18]. Punnoose [19] developed the TAM for student intentions to use e-learning. This research has further adapted Punnoose's model to help to understand student perceptions of the utility and enjoyment of the online experience (Figure 2). Importantly, this model considers individual differences for each student, acknowledging situational variables such as circumstance and experience [20] as well as social contexts that influence the use of technology [21]. These individual differences in technological self-efficacy, including barriers and challenges students face, are important as they relate to the 'digital divide', or 'the patterns of unequal access to information technology based on income, race, ethnicity, gender, age and geography' [22].

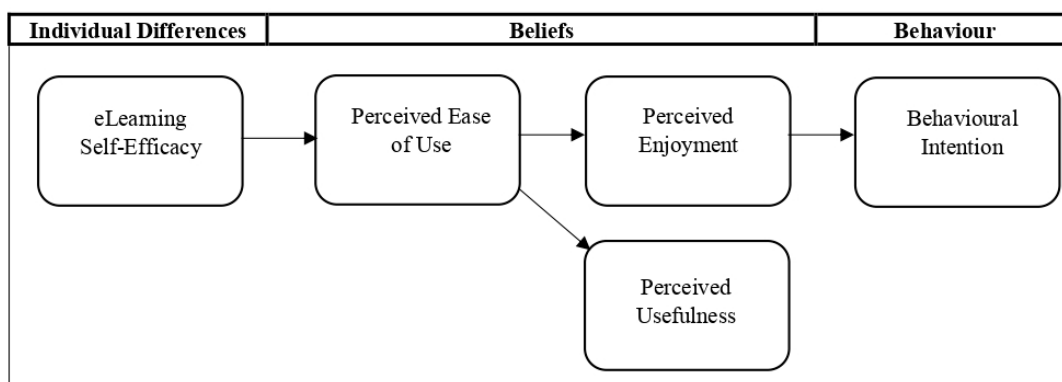


Figure 2. Adaptation of the Technology Acceptance Model (TAM) [20].

1.4. The Importance of Community and Belongingness

In higher education institutions, belongingness is often seen as recognising the students' subjective feelings [23] and generating positivity about learning [24]. Research that followed the initial impact of COVID-19 found 'interaction' and 'online communities' as the emergent themes discussed in education [15]. Online courses have been shown to have up to a 20% higher average drop-out rate than traditional courses [25], with students who are unable to interact or feel part of a community seen as at the highest risk of withdrawing [26,27]. It is therefore seen to be pertinent to build communities that empower students when performing tasks, help them feel accepted, valued and included [28,29].

In the case of e-learning, Tu and Corry [30] suggest that pedagogical approaches should incorporate interactivity (e.g., working with community members, engaging students in authentic and interactive activities, pairing novices and experts together), community engagement (e.g., knowledge within the context of the community, guided by important topics and issues and in line with members' backgrounds), collaboration (e.g., bringing together students to work towards a common goal), and reflection (e.g., engaging in reflective, interactive activities to further support learning).

2. Materials and Methods

2.1. Research Context

This case study took place one week after UAE schools and universities were closed due to COVID-19, and the entire campus facilities were moved online. All students were undergraduate Education department preservice teachers (i.e., BA Education (BA Ed), Early Childhood Studies (BA ECS) and BSc Psychology with Education (BSc PsyEd))

at a British university in Dubai, participating during the last four weeks of term. The Education department collaborated in their aim to understand barriers and challenges facing students in the sudden shift to online learning. The research aimed to understand the past experiences and learning strategies students employed prior to the start of e-learning, to explore the current e-learning experience, and to identify the effect of varied lesson delivery styles (e.g., flipped learning, live virtual lectures). Through identifying intervention points, the department aimed to innovate and evaluate new lesson techniques to improve teaching practice and increase awareness of pedagogical issues [31]. Specific research questions included:

RQ1. *What are the past experiences and expectations that preservice teachers are bringing into the period of emergency online learning?*

- A. What were past learning approaches employed by the students?
- B. What are student expectations for the e-learning environment?

RQ2. *What are the current preservice teacher learning experiences in this period of emergency online learning and what influences these experiences?*

- A. Did students perceive the e-learning experience overall to be efficacious and/or enjoyable?
- B. Did the period of emergency online learning influence student learning approaches?
- C. Did the style of lesson delivery influence the student learning experience?

2.2. Methodology

2.2.1. Participant Sampling

The researchers recruited a purposive sample of all BA Education and Early Childhood Studies students (35 students enrolled for 2019–20 term). In total, 30 students participated in the survey (29 female, 1 male; 19 students studied BA ECS, 9 BA Ed and 2 BSc PsyEd) and 27 of these students participated in the focus group, with 3 unable to participate due to connectivity issues.

2.2.2. Study Procedure

The British Educational Research Association (BERA) guidelines were followed [32]. All students completed online consent forms prior to the questionnaires and were informed that the contribution to the focus groups was entirely voluntary and that they could withdraw. Pseudonyms were used to anonymise the identity of the students taking part in the focus group, but they were made aware their names would need to be used initially to triangulate the focus group data with the questionnaire data. The research was approved by the university's ethics committee. All questionnaires and focus group questions were piloted with colleagues and feedback was used to ensure their clarity. All consent forms, recordings of focus groups, transcriptions, and data sets were stored in data protected university servers approved for storage of confidential student information and grades.

2.2.3. Questionnaires

The first questionnaire, the Past Experiences of Online Teaching and Learning, was distributed in week one of the research, and the second questionnaire, Current Experiences of Online Teaching and Learning, distributed in week four, both at the start of lessons. To ensure reliability, the questionnaire was piloted, and some questions were slightly re-worded for clarity and to align with university and e-learning contexts.

2.2.4. Lesson Delivery

Due to the government restrictions, all lessons took place online via the teleconferencing software programme 'GotoMeeting' (version 5). There were four different types of lessons conducted:

- The online version of what is known as the 'traditional lecture' [33] where lesson knowledge is imparted didactically with the assistance of a PowerPoint presentation.

- The ‘flipped lecture’, where learning concepts are recorded in 20 min video concept chunks [34]. They are uploaded to the learning platform and followed up with a seminar discussion session. ‘Task-driven interaction’ [35] was the basis of the seminars. These were either through group interaction or one-to-one tutorial discussions.
- ‘Online presentations’, where, as an alternative to in-person presentations, students were required to present online to peers. This was either formatively, presenting ideas for written assignments, or as part of their summative assessments.

2.3. Measures

2.3.1. Past Experiences of Online Teaching and Learning Questionnaire

The first questionnaire, Past Experiences of Online Teaching and Learning, was adapted from Entwistle et al. [6] to assess the students’ expected experience and what they envisaged from the upcoming four-week e-learning experience. These questionnaires have been replicated for further research [36], adapted to suit different contexts [37] and described by Parpala et al. [11] as ‘sufficiently robust’ for adaptation. For the present study, the researcher adapted the questionnaire to include terminology specific to the institution and the new e-learning environment the students had to work in. For example, the statement ‘the different types of teaching (lectures, tutorials labs etc.) supported each other well’ was amended to ‘the different online resources (lectures, videos etc.) supported each other well’. Questions that were determined to not be relevant to the context were removed.

Three scales across 17 items assessed expectations for the usefulness of e-learning for their academic and career development (e.g., ‘I will have skills to put on my CV’; five items), for their social and personal development (e.g., ‘I hope the things I learn will help me to develop as a person and broaden my horizons’; six items) and expectations for their interest, engagement and enjoyment of e-learning (e.g., ‘I expect a lot, the university already have great tools for online learning’; seven items). Students reported answers on a five-point Likert scale from ‘strongly agree’ (1) to ‘neutral’ (3) to ‘strongly disagree’ (5).

The second survey, ‘Past Approaches to Learning and Studying’ assesses student learning approach across three scales: deep learning approach, surface learning approach, and strategic learning approach [6,38] using the same five-point Likert response scale as the first survey across 24 items such as ‘I tend to take what we are taught at face value without questioning it much’ (i.e., surface approach; six items), ‘I think about what I want to get out of my studies so as to keep my work well focused’ (i.e., deep approach; eight items), and ‘I carefully prioritise my time to make sure I can read everything on the module’ (i.e., strategic approach; ten items).

Lastly, students completed one question assessing whether they have performed well academically thus far, considering performance, marks and feedback received, on a scale from ‘very well’ (9) to ‘about average’ (5) to ‘rather badly’ (1).

2.3.2. Current Experiences of Online Teaching and Learning Questionnaire

The first survey Current Approaches to Learning and Studying [6] required students to reflect on their approach to e-learning over the previous four weeks using the same five-point Likert scale to respond to 17 items related to online learning across the same three scales (i.e., deep learning approach, surface learning approach, strategic learning approach).

The second survey Experiences of Online Teaching and Learning was adapted from a survey by Entwistle et al. [6]. Students were required to reflect on the overall efficacy and benefit gained from the e-learning experience using the same five-point Likert scale (from ‘very good’ or ‘very clear’ to ‘not at all good’ or ‘not at all clear’) to respond to 23 items across five scales adapted for the research:

- Lesson Organisation (‘It was clear to me what I was supposed to learn in these lessons’; seven items),
- Student Independence (‘This unit encouraged me to related what I learned to issues in the wider world’; four items),

- Lesson Delivery ('Teachers helped us to see how you are supposed to think and reach conclusions'; five items),
- Community and Belongingness ('Talking with other students helped me to develop my understanding'; four items),
- Overall Enjoyment ('I enjoyed being involved in this period of online learning'; three items).

To further assess student experience, the 'Demands of Online Learning' survey asked participants whether they found aspects of the period of online learning easy or difficult [18,19] with a five-point response scale (1 = Very Easy, 5 = Very Difficult), across eight items (e.g., 'working with other students'; 'organising and being responsible for my own learning'), and how much they learned from these experiences (1 = a lot, 5 = very little), across seven similar items.

Lastly, students completed one question assessing the success of the period of online learning was overall on a scale from 'very successful' (9) to 'very unsuccessful' (1) with 'about average' (5) representing neutral.

2.3.3. Focus Group

A focus group was conducted weekly during the final 15 min of each lesson, although they naturally varied in length from 10 to 20 min. Procedures followed contemporary recommendations for online focus groups [39]. Both the researcher and students were familiar with the GoToMeeting software and students were made aware that this part of the session was being recorded for transcription purposes [32]. These recordings were transcribed using Otter.ai (version 3.15.0) and coded using NVivo (version 12).

The focus groups were generally quite unstructured and reflection-based, led by student discussion [30]. While questions were pre-planned before the focus groups took place, they were amended in response to the ongoing COVID-19 situation and pedagogical experience of students.

Students were presented with questions at the beginning, the discussion was allowed to develop naturally, and ideas that students raised were probed. Sample questions included asking students about the progression of the e-learning experience, the challenges students are facing, the students' feelings about the format of the lesson that day, what went well, if anything surprised them, and the ways in which e-learning can be adapted and improved to enhance their learning experience in the future.

2.4. Data Analysis

Quantitative data were analysed using SPSS version 25. The first research question involved exploring past experiences and expectations students had for the e-learning environment, their learning approach, and their past academic success; the second research question explored current experiences following the period of emergency online learning. To answer RQ1 and RQ2, survey scale scores were computed, and skewness and kurtosis were assessed. Descriptive analyses were conducted and mean scores and outliers were examined. Cut-off points on the mean were used when appropriate to categorize students in RQ1. Rank-ordering of means was used in RQ2. Pearson correlations were used to compare past and current learning approaches in RQ2.

Qualitative data were analysed for each research question and supported the interpretation of findings. The focus groups were transcribed verbatim using Microsoft Word version 16 and coded using NVivo 12. To understand student perceptions of the learning environment and lesson formats, the researcher went through an inductive and deductive coding process guided by hypotheses related to research questions. The findings were thematically analysed [40] to understand the themes arising from the focus group discussions. The researcher deductively connected themes in the discussion to the perceived student approaches found in the questionnaire (Deep Approach, Strategic Approach, Surface Approach) and individual responses to the learning approach questions were compared to the answers provided by the same respondents in the focus group. Answers were triangulated

deductively, with keywords from the questionnaires being compared to similar keywords and synonyms from the focus group transcript. To understand why students may enjoy certain lesson formats, themes were labelled under the type of lesson taught during the e-learning period (Traditional, Flip, Seminar/Tutorial, Presentation), with emerging sub-themes deductively coded using Punnoose's TAM subcategories [20]; 'perceived ease of use', 'individual differences', 'perceived enjoyment', and 'perceived usefulness'.

3. Results

3.1. RQ1 Past Experiences with Online Learning

The first research question aimed to understand previous experiences that would inform the experience with e-learning. This was done first by exploring student reports on their past learning approaches (RQ1 A) and then by exploring their expectancies for the upcoming e-learning experience (RQ1 B).

3.1.1. RQ1 A Past Learning Approaches

A scale score for each of the three learning approaches was created for each student to assess their previous reports of using a surface learning approach, a deep learning approach, and a strategic learning approach (Table 1). Skewness and kurtosis were examined as acceptable for each scale (skew range of -0.71 – 0.44 (SE = 0.46); kurtosis range of -0.96 – 0.82 (SE = 0.89)) although surface learning and deep learning were considered mildly kurtotic (0.82 and -0.96 , respectively). On average, students reported deep learning as their most used approach in the past (M = 1.79 , SD = 0.41), followed by strategic learning (M = 2.04 , SD = 0.48) and surface learning (M = 3.42 , SD = 0.71).

Table 1. Past learning approaches.

	Past Surface Approach	Past Strategic Approach	Past Deep Approach
Mean	3.42	2.04	1.79
Standard Deviation	0.71	0.48	0.41
Skewness	-0.71	0.44	0.21
Standard Error Of Skewness	0.46	0.46	0.46
Kurtosis	0.82	0.71	-0.96
Standard Error of Kurtosis	0.89	0.89	0.89

To further explore the use of different learning approaches, students were grouped by learning approach using a cut-off scale score value of 3, where 3 reflects neutral agreement and a value below 3 affirms the past use of that learning approach. As such, 19 students reported using both strategic and deep learning approaches but not surface learning, and only 3 students reported using surface learning as an approach (i.e., mean score below 3). This was reflected in the focus group data. For example, in discussing the deep approach:

The traditional way for me was like, I could make notes when we were having our lessons. When I'm doing my assignments, I always go back to my notes and see if I have any doubts or something. (Participant 28)

Similarly, demonstrating more of a strategic approach:

When we have face-to-face lectures in uni, there's a sense of routine and discipline that we can follow. (Participant 23)

3.1.2. RQ1 B Expectations for E-Learning

Expectations for the upcoming e-learning experience were explored across three scales examining its perceived usefulness for the students' career and academics, for their personal and social development, and lastly the degree to which they expected the upcoming e-learning to be interesting, engaging and enjoyable (Table 2). Interestingly, no students reported negative expectations for their upcoming e-learning period, as all scale scores had

a mean value below 4, and the means and standard deviations were all relatively similar across the three scales, with skew and kurtosis in the normal range (skew ranging from 0.59–0.91 (SE = 0.46)) and kurtosis from -0.06 to 0.76 (SE = 0.89). Students expected the e-learning environment to be useful for their career and academics ($M = 1.61$, $SD = 0.51$), to be useful for their personal and social development ($M = 1.69$, $SD = 0.53$), and to be interesting, engaging and enjoyable ($M = 2.03$, $SD = 0.41$).

Table 2. Expectations for E-learning.

	Self & Social Development	Interest & Engagement	Career & Academic
Mean	1.69	2.03	1.61
Standard Deviation	0.53	0.41	0.51
Skewness	-0.59	0.7	0.91
Standard Error of Skewness	0.46	0.46	0.46
Kurtosis	-0.06	0.29	0.76
Standard Error of Kurtosis	0.89	0.89	0.89

This affirmation of positive expectation was reflected in the focus group data. For example, in demonstrating utility for their career:

I know for myself in the beginning when I was looking at studying I did look at distance learning because I work full time. It's nice to know that this could be something in the future that could be implemented. (Participant 7)

In demonstrating utility for personal and social development:

It's really nice to have everyone together regardless of whether we are in one room or not ... Virtually being able to talk to each other backward and forward it really makes it easier. (Participant 25)

Indicating utility for engaging the audience through the virtual environment:

It's easy for people to lose their focus when it comes to presentations online. But, if you build your skills in <online> presenting, you're going to be able to render people's interest in your topic. (Participant 14)

However, in analysing the raw data, there was one student who did have relatively negative expectations (with scale scores ranging from 2.83 to 3.0), and this was reflected in her interview response as well:

I feel like when we come to class, we're all together, we get to share our struggles and our stress. It's very different to 10 min chats online and then online messages. (Participant 19)

Lastly, students reported their success academically thus far, prior to the start of online learning. In total, 54% of respondents ($n = 14$) reported doing below average (from 'not so well' to 'rather badly'), 27% ($n = 7$) reported performing at an average level, and 18% ($n = 5$) reported doing well (from 'above average' to 'quite well'), although, interestingly their actual marks received on previous courses reflected a relatively strong performance, similar to prior cohorts, suggesting students self-reported more academic difficulty than data represent.

3.2. RQ2 Current Experiences and Influences on these Experiences

The second research question examined student reflections on the online period of learning, including an understanding of the degree to which the students found the e-learning period efficacious and the skills they gained and challenges they faced (RQ2 A), and the ways in which these experiences were influenced by past learning approaches (RQ2 B) and by changes in pedagogy (e.g., lesson delivery style) (RQ2 C), in part to inform the future blended approach by the university.

3.2.1. RQ2 A Efficacy of E-Learning, Skills Gained and Challenges Faced

To understand the students' experience of e-learning, students were first asked to report the perceived efficacy of the e-learning period across five scales (Table 3). Results were overwhelmingly positive, with the mean value on all five scales reporting between 1 and 2 (i.e., from 'very clear' to 'clear' or from 'very good' to 'good'). In order of most valued to least, these are lesson organisation (M = 1.37, SD = 0.4), community and belongingness (M = 1.41, SD = 0.56), lesson delivery (M = 1.50, SD = 0.43), overall enjoyment (M = 1.63, SD = 0.60), and student independence (M = 1.63, SD = 0.61).

Table 3. Efficacy of e-learning, skills gained and challenges faced.

	Lesson Organisation	Student Independence	Lesson Delivery	Community & Belongingness
Mean	1.37	1.63	1.5	1.41
Standard Deviation	0.4	0.61	0.43	0.56
Skewness	1.1	1.1	0.88	1.79
Standard Error of Skewness	0.43	0.43	0.43	0.43
Kurtosis	0.35	2.9	0.4	3.2
Standard Error of Kurtosis	0.85	0.85	0.85	0.85

This positive report of experiences was echoed in the qualitative data as well. For example, one student noted:

It is really surprising that this has actually worked out ... The fact that this has worked out very smoothly and has gone really well, I'm really happy about that. (Participant 7)

Three outliers were identified from the participants who had negative views on the whole experience. Their views on the online period were also reflected in the focus group data:

I personally feel I enjoy the live ... classes I feel like when it comes to listening to a recording, I don't personally go with that I don't understand that really very well. (Participant 29)

Others spoke of unique challenges in online learning:

It's so mentally draining, we're, so we're stressed, but not enough to be motivated to do our work just because there's no structure there is no routine ... You lose the discipline and routine if you're doing online. It's not the same feel as being in the classroom. (Participant 19)

Students also reported whether elements of online learning were easy or challenging across eight individual items (Table 4). All items had a mean below 3 (a neutral response), meaning students found them either very easy or easy. In order of difficulty, students found 'working with other students' (M = 2.55, SD = 1.12) and 'tracking down information for myself' (M = 2.44, SD = 1.24) to be the most challenging, followed by 'information technology and computing skills' (M = 2.45, SD = 0.99), 'communicating knowledge and ideas effectively' (M = 2.24, SD = 1.02), 'what I was expected to know about online learning to begin with' (M = 2.10, SD = 1.29) and the 'ideas and problems I had to deal with' (M = 2.0, SD = 1.22). Student found the easier elements to be 'the skills or technical skills I needed' (1.83, SD = 0.89) and 'organizing and being responsible for my own learning' (M = 1.76, SD = 0.95). The focus group data added additional challenges with e-learning, including connectivity at home (Participant 1, 2, 19, 22, 24 and 25), children (Participant 11 and 27), finding a quiet place (Participant 23 and 4), and being more distracted than in the physical classroom (Participant 21).

Table 4. How easy or difficult students found different aspects of online learning.

	Mean	Standard Deviation
What I was expected to know about Online Learning to begin with	2.1	1.29
The ideas and problems I had to deal with	2	1.22
The skills or technical skills I needed	1.83	0.89
Working with other students	2.55	1.12
Organising and being responsible for my own learning	1.76	0.95
Communicating knowledge and ideas effectively	2.24	1.02
Tracking down information for myself	2.55	1.24
Information technology/computing skills	2.45	0.99

Despite these challenges, students reported that they had learned a lot (i.e., all means were below 3) when asked about the skills they had learned (Table 5). Students reported the most learning in the ‘ability to think about ideas or to solve problems’ (M = 1.79, SD = 0.94), which is interesting considering independent learning was also one of the things students found most difficult. The skill students reported learning the least was ‘the ability to track down information’ (M = 2.59, SD = 1.21), with other skills relatively similar and representing significant learning from most learned first: ‘information technology/computing skills’ (M = 2.10, SD = 0.77), ‘ability to work with other students’ (M = 2.21, SD = 0.86), ‘organizing and being responsible for my own learning’ (M = 2.21, SD = 0.98), and ‘ability to communicate knowledge and ideas effectively’ (M = 2.28, SD = 1.16).

Table 5. Skills students learned from the emergency online learning experience.

	Mean	Standard Deviation
Knowledge and understanding about the topics covered	2.31	1.07
Ability to think about ideas or to solve problems	1.79	0.94
Ability to work with other students	2.21	0.86
Organising and being responsible for my own learning	2.21	0.98
Ability to communicate knowledge and ideas effectively	2.28	1.16
Ability to track down information	2.59	1.21
Information technology/computing skills	2.1	0.77

It is worth noting that despite the trend that most students found the demands of the learning experience to be easy and that they reported gaining a range of knowledge and skills, standard deviations above 1 indicate variability among students, particularly around items such as ‘what I was supposed to know about online learning to begin with’, ‘the ideas and problems I had to deal with’, and ‘Information Technology skills’. This is also reflected in the focus group data:

I found it really difficult to follow the presentation that other colleagues were giving. And when I was giving it myself, I just felt like I felt like I was talking to myself. (Participant 29)

Similarly, another student demonstrated struggling overall:

The recorded and the live sessions are really good but I don't think it [online learning] is a method we prefer, because, obviously, we've been taught for so long, in the traditional face to face. (Participant 19)

3.2.2. RQ2 B Changes in Learning Approach and Influences on Learning

To measure any significant change to the student approach to learning after the period of online learning, the mean for each type of learning approach (i.e., deep, strategic, and surface) from pre and post surveys were correlated using a two-tailed Pearson test (Table 6). The relatively high levels of past deep and strategic learning approaches, analysed using mean cut-off scores as described in RQ1A, were significantly correlated to current high

levels of deep and strategic learning approaches, $r(25) = 0.44, p = 0.03$ and $r(25) = 0.56, p = 0.03$. Similarly, 14 of the students who reported high deep and strategic learning approaches in the past reported continuing those learning approaches after the four weeks of online learning. Interestingly, past and current surface learning were not correlated, and five students who did not report high surface learning in the past did report high surface learning after the four weeks of online learning, suggesting that more students engaged in surface learning despite past learning approaches.

Table 6. Correlations between past and current approaches to learning.

		Current Surface	Current Strategic	Current Deep	Past Surface	Past Strategic	Past Deep
Current Surface	Pearson Correlation	1	−0.66	0.15	0.53 **	−0.11	−0.11
	Sig. (2-tailed)		0.73	0.44	0.01	0.58	0.6
Current Strategic	Pearson Correlation	−0.66	1	0.45 *	−0.34	0.56 **	0.31
	Sig. (2-tailed)	0.73		0.02	0.09	0.03	0.13
Current Deep	Pearson Correlation	0.15	0.45 *	1	0.14	0.36	0.44 *
	Sig. (2-tailed)	0.44	0.02		0.5	0.08	0.03
Past Surface	Pearson Correlation	0.53 **	−0.34	0.14	1	−0.22	0.03
	Sig. (2-tailed)	0.01	0.09	0.5		0.28	0.87
Past Strategic	Pearson Correlation	−0.11	0.56 **	0.36	−0.22	1	0.54 **
	Sig. (2-tailed)	0.58	0.01	0.08	0.28		0.01
Past Deep	Pearson Correlation	−0.11	0.31	0.44 *	0.03	0.54 **	1
	Sig. (2-tailed)	0.6	0.13	0.03	0.87	0.01	

** Correlation is significant at the 0.01 level (2-tailed). * Correlation is significant at the 0.05 level (2-tailed).

Past learning approaches were also compared to the overall experience of the online period of learning (Table 7). Students who reported a high strategic learning approach in the first questionnaire had a positive experience when reporting on the efficacy of the online learning period across all five scales, with significant positive correlations (lesson organisation $r(25) = 0.55, p = 0.004$., community and belongingness $r(25) = 0.56, p = 0.003$, lesson delivery $r(25) = 0.60, p = 0.001$, overall enjoyment $r(25) = 0.64, p < 0.001$, and student independence $r(25) = 0.62, p = 0.001$). In summary, the more a student uses a strategic approach to learning, the more efficacious the online period was perceived to be. Having a deep learning approach was significantly correlated to efficacy with student independence, $r(25) = 0.47, p = 0.02$, but not with any other efficacy scales.

Table 7. Correlations between past learning approaches and the experience of online learning.

		(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
(1) Past Surface	Pearson Correlation	1	−0.22	0.34	0.3	−0.13	−0.29	0.08	0.01
	Sig. (2-tailed)		0.277	0.871	0.142	0.523	0.152	0.684	0.982
(2) Past Strategic	Pearson Correlation	−0.23	1	0.55 **	0.55 **	0.62 **	0.6 **	0.56 **	0.64 **
	Sig. (2-tailed)	0.277		0.004	0.004	0.001	0.001	0.003	0.000
(3) Past Deep	Pearson Correlation	0.03	0.54 **	1	0.21	0.47 *	0.13	0.28	0.26
	Sig. (2-tailed)	0.871	0.004		0.296	0.015	0.532	0.168	0.174
(4) Lesson Organisation	Pearson Correlation	−0.3	0.55 **	0.21	1	0.45 *	0.75 **	0.59 **	0.44 *
	Sig. (2-tailed)	0.142	0.004	0.296		0.014	0.000	0.001	0.016
(5) Student Independence	Pearson Correlation	0.13	0.62 **	0.47 *	0.45 *	1	0.6 **	0.64 **	0.79 **
	Sig. (2-tailed)	0.523	0.001	0.015	0.014		0.001	0.000	0.000
(6) Lesson Delivery	Pearson Correlation	−0.29	0.6 **	0.13	0.75 **	0.6 **	1	0.7 **	0.59 **
	Sig. (2-tailed)	0.152	0.001	0.532	0.000	0.001		0.000	0.001
(7) Community & Belongingness	Pearson Correlation	0.09	0.56 **	0.28	0.59 **	0.64 **	0.7 **	1	0.63 **
	Sig. (2-tailed)	0.684	0.003	0.168	0.001	0.000	0.000		0.000
(8) Overall Enjoyment	Pearson Correlation	0.01	0.64 **	0.28	0.44 *	0.79 *	0.59 *	0.63 *	1
	Sig. (2-tailed)	0.982	0.000	0.174	0.016	0.000	0.001	0.000	

** Correlation is significant at the 0.01 level (2-tailed). * Correlation is significant at the 0.05 level (2-tailed).

Many comments from students echoed this focus on the success of online learning in part for the strategic learning approaches enabled:

For me <Goto Meeting> is an easy app to use. In this time of uncertainty, it's better to have any sort of a way where we can converse and clear our doubts and arrange for resources or anything that we need, so I think it's kind of a very helpful tool. (Participant 23)

Using a live Google document was good because the others were able to comment and share their perspectives on your presentation. I liked the Google document and tutorials, because it still gets the same sense and same feeling as seeing you in class. (Participant 22)

3.2.3. RQ2 C Influence of Changes in Pedagogy and Lesson Delivery

Throughout the e-learning period, lesson delivery was intentionally manipulated to test student response to changes in pedagogy and preference for different lesson styles in belonging the e-learning environment, including live lectures delivered online, the flipped lecture, task-driven interactions as the basis for learning, and student delivery of information to their peers as presentations. After each lesson style, students engaged in a group discussion to reflect on and review the efficacy.

Students overwhelmingly reported a preference for the live lecture because it felt the most like a traditional classroom, with interactions with peers and the teacher:

I think that the live lectures are good, because it's a way for us to still interact and to be able to hear and listen to everyone else's perspectives of things, although it's not like a classroom, it still gives a vibe of the classroom.

(Participant 13)

I also like the live lecture and presentations on Goto Meeting, because, if I'm being honest, it's the closest thing we have to being back into the classroom, and we're even allowed to still ask questions via the chat.

(Participant 14)

Students also reported a preference for live lectures for the strategic affordances it allowed:

For me the live content is really beneficial because I am right there with you, any doubts I can ask and clear right away.

(Participant 22)

We can interrupt the slideshows and ask questions as they go along.

(Participant 7)

However, one student did recognize that the preference for live lectures may be due to the sudden shift to online learning:

Maybe we will start to like it, but because it is the beginning is why we're still saying that we prefer face-to-face, and it's something new to us, that's why we want to go back to the old style of seeing you one-to-one.

(Participant 22)

4. Discussion of Findings

This study sought to gain an understanding of student perceptions of the emergency online environment and the ways in which they approached their learning as well as the influences of different pedagogical practices, with the aim of guiding the future e-learning approach at university.

4.1. Efficacy of E-Learning

Overall, students found the shift to e-learning to be a generally positive experience (See RQ2 A). The qualitative data highlighted that the students felt their learning was effective primarily due to factors such as interactive collaboration, reflective activities,

and active engagement [29]. Thus, efficacy is connected to the pedagogical approach. However, specific influences on the efficacy of the e-learning period for individual students (e.g., individual differences in learning approach, challenges and barriers to e-learning for students) are important for furthering our understanding of the ways to maximize online education. Those showing preference for the more traditional 'live' method of teaching, for example, are likely to be students who would normally require more help and support.

4.2. *The Influence of Prior Experiences and Expectations*

Students were impressively positive about their online learning experience, where no students reported negative expectations for the learning period before it began but qualitative data did highlight some hesitancy at the beginning. Their expectations generally met their reported perceptions of the efficacy, where they expected it to be useful for career, academics, personal and social development. It would be very interesting to explore the impact of negative expectations for e-learning on students' experiences in the future.

Interestingly, the more students used a strategic approach to learning, the more efficacious they felt the e-learning was overall. This correlates with previous findings that equate a positive perception to the environment with a 'deep' and 'strategic' approach [8–13]. There may be more opportunities for deep learning as students become familiar with the e-learning situation. As discussed in Entwistle et al. [7], deep and strategic learning approaches are not only reflected in student learning intentions, but in the freedom offered within the teaching and learning environment. Therefore, these approaches should be continued to be fostered in the department's move to a more blended model.

4.3. *Pedagogical Impact*

Traditional lectures were the most comfortable for students and should be the primary mode of e-learning delivery in future, aligning with Entwistle et al. [7] Concepts Related to the Quality of Learning at University Model (2002), where the format of lesson influences the quality of learning achieved. The live classroom lecture is perceived by students as an environment that closely replicates the physical campus; students can interact with the lecturer and each other and experience subjective feelings of belongingness, as highlighted in the focus group data. This subjective feeling of belongingness aligns with Korpershoek et al. [29], as students want to feel that they have a connectedness with the University. This was maintained within the challenging context of COVID-19. When future live lectures are planned, they should simulate the classroom environment by allowing opportunities for further discussion and collaboration (e.g., breakout rooms for discussion, 'raising hands' in online platforms, etc.). Students highlighted the need to be able to 'stop for discussion' or to seek further meaning.

This and other studies [41–45] found that students had a strong desire to engage and understand the subject matter if provided suitable e-learning resources and support. Although traditional lectures will continue as the primary pedagogical approach, alternative approaches such as 'flipped learning' should be further explored. New approaches should be applied mindfully in alignment with the curriculum with deliberate introductions that support students' comfort and engagement [46].

4.4. *Technology Adoption, Barriers and Challenges*

The majority of students found the technology simple enough to use and saw the justification of its use for academic purposes and social needs during the pandemic. In alignment with an adapted Technology Adoption Model [19], students reported positively on the ease of use, the perceived usefulness, and their overall enjoyment of the technology, which is encouraging for the future use of e-learning in the department.

Predictably, there were individual differences among students [19]. Certain students found the digital skills required to be undemanding whilst others found this aspect to be the most challenging of the e-learning period. It is clear that digital skill training for preservice teachers would support the success of technology adoption and use in future educational

practices [14,15]. Students were also affected by situational variables experienced during the lockdown period. According to the focus group data, the measurable demographic variables that effected a student's perceived ease of use were connectivity and home distractions. These inevitable glitches emphasise a need for balance between traditional lectures, which require good connection, and more asynchronous methods that reduce the influence of these disruptions [47]. This is particularly important for lessening the impact of the digital divide and allowing for a more inclusive environment [22]. The 'Competitive Knowledge Economy' is one of the pillars of the UAE's Vision 2021 [2], and such barriers could influence student decisions to continue with higher education.

4.5. *Communities of Learning and Belongingness*

Evident throughout the results is the importance that students place on the sense of community and collaborative learning with peers and lecturers within e-learning environments (See RQ2 A and RQ2 C). Students valued these interactions and experienced them as particularly worthwhile aspects of online learning. Student remarks highlighted the positive influence of these interactions on their overall enjoyment and credited these relationships as a motivation for studying online and undertaking studies. The research advocates that future e-learning must hold community building as one of its main agendas to promote high quality higher education [28]. Sotardi [23] emphasises that institutions should develop strategic plans to focus on belongingness and constructive alignment, creating an inclusive learning environment for all [29,30]. Research suggests a focus on task-driven curriculum co-construction activities [35] and reflection as key to building learning environment that work for each individual [20]. A community built through action will help separate higher education from the physical institution (Wellman, 1999) and can support the online community and sense of belonging for students [14].

Just as importantly, the study findings highlight the community and sense of belonging that the students already felt in association with the university. Prior to campus closure, the Education students experienced 19 weeks of higher education (of a 24-week academic year) in a traditional format (e.g., in-person classes, collaborative group projects with peers, extracurricular activities, and events) that contributed to the climate of community and belongingness that carried forward into the online learning environment. It is important to understand that this experience differs for students joining higher education in an e-learning environment without traditional opportunities for community building, and determine the ways to best promote a sense of community and belongingness for those students moving forward.

4.6. *Limitations*

In analysis of the data, the relationship between the researcher and the researched or the positionality should be considered [48], including the observer effect and social desirability in focus groups [49]. These preservice teachers were discussing their preferred lesson style, and it may have understandably been difficult for some to objectively say they disliked a lesson or did not understand content due to the lesson format. The researcher tried to create a safe space, attempting to mitigate this by allowing contributions to be voluntary. Cohen et al. [31] argued that the limitations of focus groups are that group dynamics can lead to domination by some and non-participation by others. Indeed, within some of the focus groups an outlier participant was particularly vocal and expressive, establishing themes concerning limitations of the online environment.

The researcher and students had built a strong rapport before the research, which likely enhanced the detail and utility of focus group data [50]. Triangulation of questionnaire and focus group data aimed to further strengthen the findings. However, the small sample size, gender bias (i.e., female sample), and unique context of the sudden shift to e-learning due to the pandemic suggest that caution should be used in generalising these findings. Despite the limitations, capturing the student experience of all eligible students was considered to have value, as this was a uniquely difficult time with relatively little preparation for

e-learning for students (e.g., complicated demands at home, connectivity issues, well-being concerns due to the pandemic), as well as for lecturers, and for the higher education institution overall.

4.7. Recommendations

At the time of writing this paper, the global pandemic is still present. Future research must assist preservice teacher programme adaptation to the new learning environment. It should also provide important insight into the e-learning response for future pandemics or global interruptions to teacher education.

While this research found a generally positive e-learning experience and clear path forward in blending traditional with technology-enhanced approaches, it is important that future research aims to listen to and meet the needs of those for whom the environment is not working due to either learning approaches, individual contextual challenges and barriers, or a need for technology adoption support. In addition, future research must aim to foster a sense of community and belonging in these unique e-learning environments.

5. Conclusions

This research aimed to understand how Education and Early Childhood Studies students at a university in Dubai responded to the change in learning environment during the COVID-19 lockdown and what implications this had for a future blended learning approach, as it is likely that teacher education will continue to maintain some element of blended learning in the future. When analysed alongside Entwistle et al. Concepts Related to the Quality of Learning at University Model [6] and the Technology Acceptance Model [19], the data facilitates an understanding of the influences of past experiences alongside pedagogical variations and the specific needs, skills, and barriers of each student. It evokes an e-learning curriculum that not only delivers effective academic content, but forms a community of reflective and interactive learners connected to the lecturer, the institution, and one another. This research adds to a growing body of literature that will support these global efforts to provide the best e-learning tools and pedagogy to ensure high quality education for all future educators.

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