The Influence of Collaboration, Participation, and Experience on Undergraduate Learner Engagement in the Online Teaching-Learning Environment

Nour Al Okla
Eman Kamel Rababa
United Arab Emirates University, UAE

Shashidhar Belbase
Troy University, USA
United Arab Emirates University, UAE

Ghadah Al Murshidi
United Arab Emirates University, UAE

Abstract
This study aimed to investigate the factors that influenced undergraduate learners' engagement in the online environment in higher education institutions in the UAE. This quantitative study used an online survey that was distributed to undergraduate students at three universities in the UAE. Altogether, 126 responses were received, coded, and prepared for analysis. The findings indicated that the participants' engagement levels in the online environment were influenced by their collaboration, learning opportunities, utilization of educational technology, and the learners' relationships with their instructors and colleagues. The results also showed that there was no statistically significant relationship between the learners' participation in online activities and their engagement levels. These findings have pedagogical implications in dealing with the complex and dynamic nature of the construct called *learner engagement* in the online environment and suggest providing undergraduate learners with real-life learning opportunities to enhance their collaboration, use of technology, and effective communication.

Keywords: Online learning, undergraduate learners, learners' perceptions, learner engagement.

Al Okla, N., Rababa, E., Belbase, S. & Al Murshidi, G. (2023). The influence of collaboration, participation, and experience of undergraduate learner engagement in the online teaching-learning environment. *Online Learning, 27*(3), 1-37. DOI: 10.24059/olj.v27i3.3505

Learner engagement has been acknowledged as a factor of paramount influence on learner performance and academic success (Akbari et al., 2016; Johnson & Sinatra, 2013; Mercer, 2019; Zhang & Yang, 2021). There hasn't been consensus among researchers on a single definition to explain the idea of learner engagement, despite the significance of it in all educational settings (Cavanagh, 2015). This can be due to the construct's intricate concept. Skinner and his associates offer a concept of learner engagement (2009) as "the quality of students' participation or connection with the educational endeavor and hence with activities, values, individuals, aims, and places that comprise it" (p.495). Another attempted definition describes learner engagement as "the involvement of the student's cognitive and emotional energy to accomplish a learning task" (Halverson & Graham, 2019, p. 145). These definitions emphasized correlation between learner engagement and academic achievement, satisfaction, and disposition towards effort and time investment in the learning process (Wang & Zhang, 2020).

The impact of learner engagement on students' achievement and motivation when using flexible and varied online resources has drawn scholarly attention (Dahalan et al., 2012). As a result, the learners may then have the chance to engage in active learning through their own practice and experience (Barkley & Major, 2020; Hiver et al., 2021; Lambert et al., 2017). In this context, the construct of learner engagement has gained more importance during the COVID-19 pandemic. During the recent changes in the educational systems due to the influence of COVID-19, blended and online learning have been common practices in many countries (Oraif & Elyas, 2021). However, student engagement should not be the only a formality of classroom interaction or course requirement, rather it should be a source of meaningful learning (Berry & Kowal, 2022).

Due to the COVID-19 pandemic, the government of the United Arab Emirates suspended all face-to-face teaching and learning; the case of the UAE was not different from other countries in the world. The Ministry of Education in the UAE decided to shift all school and university programs in both public and private sectors to the online mode of learning in March 2020 (The United Arab Emirates Government Portal, 2022). The online mode of teaching and learning caused a sense of uncertainty and a lack of motivation among many learners in different stages (Mosleh et al., 2022). Moreover, lack of experience among teachers, students, and parents in managing the online learning mode produced a chaotic learning environment that affected the learners' emotions, engagement, and motivation during the transition to the online learning programs (Hasan & Bao, 2020). This situation also created new challenges regarding the modified curriculum, delivery mode, and designed activities (Maraqa et al., 2022). All these challenges have influenced learners' motivation and engagement in the online environment and imposed additional responsibility on the educators to adapt to the new situation and assist the learners to be more motivated and engaged during difficult times (Omar et al., 2021). This situation creates the need for new methodologies to assist the learners in the process of adaptation to the new learning environment (Al Mahdawi et al., 2021). In order to use the most efficient learning and teaching techniques to enhance the students' experiences and accomplishment of learning outcomes, it is also necessary for instructors and educators to gain a deeper knowledge of the concept of learner engagement (Gallagher et al., 2017).

Although learner engagement has been extensively investigated in various educational settings and different learning (traditional and online) delivery modes (Carroll, 2021; Martin & Bolliger, 2018) over the past decades, most studies have investigated the different types of learner engagement, the indicators of learner engagement (using and testing various scales), and

the correlations between the levels of learner engagement and the learners' academic achievement and motivation (Prince et al., 2020). Many studies have also investigated the different dimensions of learner engagement including the cognitive, behavioral, social, and emotional dimensions in the online environment (Carroll et al., 2021; Hiver et al., 2021; Martin & Bolliger, 2018; Omar et al., 2021). However, there seems to be confusion among researchers when it comes to researching the factors that influenced learner engagement in various contexts as they measure engagement indicators (e.g., Ogunyemi et al., 2022; Ray et al., 2021), rather than engagement facilitators. Moreover, studies on learner engagement in the Arab region in general, and the UAE in particular, seem to be scarce (except for studies like Omar et al., 2021). As a result, the significance of the study stems from the fact that it fills a gap in the literature in which research on learner engagement, particularly in the online environment, seem to be lacking. Further, the study aims at providing an understanding of the factors that may influence undergraduate learners' engagement in a relatively novel delivery mode in the region.

The purpose of the current study is to investigate the variables that affected undergraduate students' participation in online courses at UAE higher education institutions. Hence, the study provides a deeper understanding of the complicated notion of student engagement and the elements that influenced learner engagement in the online undergraduate education context. The purpose of the study is to investigate undergraduate learners' engagement, involvement, and the factors that influenced the level of their engagement in the online learning process. The study intends to answer the following research questions:

1. What are the factors that influence undergraduate learners' engagement in online classes?
2. How can instructors improve learner engagement in online undergraduate classes?

This study addresses the factors that influenced the learners' engagement in an environment that was considered novel to the UAE context. Furthermore, while the construct of learner engagement has been studied in traditional learning environments, it has not been investigated in light of the factors that influenced it in the context of UAE. The current study sheds light on the complexity of the construct of learner engagement and provides insight into the learners' perceptions of the factors that influenced their engagement in the new online learning environment. It also offers educators and teachers with recommendations for the best strategies and methodologies for increasing learner engagement and improving their learning experience in online undergraduate classes.

Literature Review

According to Reeve et al. (2004), learner engagement refers to students' active participation and involvement in a variety of learning environments and activities. This active energy may help students connect with the activities they are meant to be participating in (Russell et al., 2005). The construct of learner engagement has gained more significance as it is related to different factors, including academic, social, emotional, cognitive, and behavioural aspects (DeVito, 2016). It is also a variable that is influenced by various relationships, such as the learners' relationships with their learning contexts, including their home and school environments, as well as their relationships with their colleagues, instructors, and stakeholders (Reschly & Christenson, 2012). All these factors make learner engagement a significant concept that needs to be studied and comprehended.

Significance of Learner Engagement

Learner engagement has been related to variables like learners' achievement, learning investment, persistence, satisfaction, and the opportunity to formulate an effective learning community (Barkley & Major, 2020; Conrad & Donaldson, 2011; Lambert et al., 2017; Wigfeld et al., 2015). Such conceptualizations helped researchers study learner engagement with different frameworks and models to assist educators in understanding and evaluating this complex and dynamic construct despite a lack of a unified definition or cohesive description of the construct (Fredricks et al., 2004). The importance of learner engagement is weighed against the negative influences of learner disengagement at various levels (Finn & Zimmer, 2012).

Learner engagement may not only stem from personal and individual factors, but also connects to the educators and the institutional practices (Finn & Zimmer, 2012). Therefore, understanding the dynamicity, complexity, and multi-faceted factors that influence learner engagement poses additional emphasis on its significance to achieve academic, social, and emotional success among learners (Symonds et al., 2019). In addition to the complexity and the dynamicity of the construct of learner engagement, evidence from research has shown a positive correlation between high levels of learner engagement and the learners' achievement, long-term retention, and social and psychological well-being (Crick & Goldspink, 2014; Deng et al., 2020; Halverson & Graham, 2019). These studies specifically indicate the importance of learner engagement as a construct which is highly valuable in different learning environments.

Models of Learner Engagement

The complex and multidimensional nature of the construct of learner engagement prompted the development of various explanatory models which attempted to identify the major aspects and dimensions of the construct. One of the early models to explain learner engagement was developed by Fredericks et al. (2004) with three dimensions. These dimensions include the behavioral, cognitive, and emotional dimensions (Nazamud-din et al., 2020). The dimension of behavioral engagement represents the learners' deployed practices, positive efforts, and active participation in different learning events (Nazamud-din et al., 2020). Likewise, the cognitive engagement dimension has been viewed in light of the learners' asserted educational goals, their expressed self-regulation, and their effective and positive investment in learning (Mahatmya et al., 2012; Nazamud-din et al., 2020). The emotional dimension refers to the learners' attachment and sense of belonging to their learning environment, their productive attitude, and their keen interest in various learning activities and events (Blumenfeld et al., 2005; Fredericks et al., 2004; Mahatmya et al., 2012; Nazamud-din et al., 2020). Behavioral learner engagement is usually associated with the level of learners' actual and active participation in the learning endeavors which include their participation in academic, social, or even other supplementary educational activities (Nazamud-din et al., 2020).

Four additional dimensions—psychological, academic, behavioral, and cognitive—were added to the idea of learner engagement by the other models (Appleton et al., 2006; Christenson et al., 2008; Halverson & Graham, 2019). For each of these kinds, there are various markers that are available, according to Appleton and colleagues (2006). Similar to this, Skinner and his colleagues' model from 2008 and 2009 has four dimensions. The other two of these dimensions dealt with behavioral and emotional disaffection as well as behavioral and emotional disaffection, respectively. The engagement dimensions in this model are similar to the previous models. Likewise, a multi-dimensional aspect of learner engagement has also been represented in another model by Finn and Zimmer (2012) with four-dimensional constructs including the

academic, social, cognitive, and affective dimensions. Among these and other models, more recently, an applied model of learner engagement was proposed by Carrol and her colleagues to provide a practical tool that can be utilized by practitioners to engage learners in different educational settings (Carrol et al., 2021). The model introduces factors that influence learner engagement, classifying them as individual, task-related, and environmental. It also presents "measurable indicators of learner engagement that provide practitioners opportunities to assess engagement levels and adapt learning content accordingly" (Carrol et al., 2021, p. 760).

Czerkawski and Lyman (2016) propose an instructional design framework that fosters learner engagement in the online environment. The framework consists of four related phases. The first phase includes identifying the instructional needs by conducting a needs assessment and learners' analysis. The second phase implies defining instructional goals and objectives. The third phase entails developing the learning environment by conducting formative assessment, developing interaction and collaboration strategies, and selecting media and instructional resources. Finally, the fourth phase includes the summative assessment in which educators conduct learning outcomes assessment and evaluate instructional effectiveness (Czerkawski & Lyman, 2016).

Current learner engagement models, instruments, and measurement tools are inadequate due to the complexity of the construct of learner engagement and the specifications of different contextual factors which could be related to the course, activity, or institutional levels (Halverson & Graham, 2019). Therefore, Halverson and Graham (2019) call for a new model which applies engagement measurement instruments in traditional, blended, and online learning contexts.

Indicators and Facilitators of Learner Engagement

Although many researchers developed models to identify the complexity and multi-dimensional aspect of the construct of learner engagement, there is a need to distinguish between facilitators and indicators of learner engagement in order to reach a comprehensive understanding of the construct (Sinclair et al., 2003; Skinner et al., 2008). According to Skinner and his associates (2008), engagement indicators represent the characteristics that are innate to the construct, whereas facilitators refer to the causal factors which could influence the construct from outside. Skinner and Pitzer (2012) also call for a distinction between indicators, facilitators, and outcomes in order to add clarity to the concept of learner engagement. In a proposed motivational model of learner engagement, Skinner and Pitzer (2012) state that the indicators of learner engagement are actional in nature. Therefore, the behavioral, emotional, and cognitive dimensions can be observed through learners' interactions with their academic environment in the learning activities, whereas academic performance and achievement cannot be considered as indicators of learner engagement as they are learning outcomes that are differentiated from engagement indicators and facilitators (Coates, 2006; Redmond et al., 2018).

There has been considerable misunderstanding regarding concepts of engagement indicators and facilitators. Skinner and Pitzer (2012) propose two types of facilitators that include personal and social facilitators. Personal facilitators represent the learners' self-perceptions or self-systems which include their sense of self-efficacy or belongingness to the learning context (Halverson & Graham, 2019). Social facilitators refer to the learners' interpersonal interactions with the main social elements in the learning process like their instructors, colleagues, and other stakeholders (Skinner & Pitzer, 2012). While considering social elements of online learning, one should not forget social engagement as an important aspect of online learning, especially when there is no other option for collaboration besides peer or group interaction through virtual means (Redmond et al., 2018). There can be various forms of

collaborative engagement in online learning. For example, peer collaboration, student-teacher collaboration, institutional collaboration, and professional collaboration among experts in the field of online teaching and learning (Albion, 2014; Pittaway & Moss, 2014; Redmond, 2018).

Although researchers understand the significance of personal and contextual facilitators, they are unable to assess the precise impact of interventions in the absence of clear engagement indicators measurements. Many engagement measurement tools mix up facilitators and indicators, assessing engagement facilitators rather than engagement indicators (Halverson & Graham, 2019). The study of engagement facilitators is essential but not enough without understanding the indicators that allow researchers and educators to have effective measures to test the efficacy of the interventions used to improve learner engagement (Halverson & Graham, 2019). Halverson and Graham (2019) propose a blended learning engagement framework to assist measuring learner engagement. They believe that cognitive and emotional learner engagement are the essential factors to understand learner engagement through the manifestations of the cognitive and emotional indicators, which contribute to achieve the desired learning outcomes. Both cognitive and emotional engagements are comprised of different factors. Cognitive engagement includes both quantity and quality factors. The quantity factors of cognitive engagement include the learners' attention, effort and persistence, and time spent on a task, whereas the quality factors are represented by the metacognitive strategies, concentration, and learners' interest and curiosity. On the other hand, emotional engagement includes positive and negative emotional aspects. The positive aspects of learners' emotional engagement include emotions like pleasure and self-confidence, whereas the negative aspects of learners' emotional/affective engagement include tedium, frustration, and anxiety (Halverson & Graham, 2019). This framework is used by the researchers in blended and online learning environments. Other studies also acknowledge the importance of cognitive and emotional learner engagement. For instance, Reschly and Christenson (2012) indicated that cognitive and affective engagement comprise the internal processes through which academic and behavioral engagement is mediated. Moreover, a study (Henrie et al., 2015) found conceptual confusion between the concepts of cognitive engagement and behavioral engagement. Similarly, Pekrun and Linnenbrink-Garcia's (2012) propose a model that includes an overlap between the cognitive and behavioral aspects of engagement among their five-types model of engagement.

Learner Engagement in the Online Context

Learner engagement is a multidimensional and dynamic construct that is difficult to quantify in traditional learning contexts as well as in blended and online learning environments (Alharbi, 2019; Dahleez et al., 2021). Different mixtures of human and technical interaction, as well as instructional strategies, are inherent to the structure of the online learning environment and have an impact on learner engagement. (Halverson & Graham, 2019). Therefore, several levels of learner engagement, from the course level to the institutional level (Ainley, 2012), should be monitored depending on the interventions (Wang et al., 2014). Online students encounter difficulties with their ability to self-regulate and stay committed to the courses in the online setting. (Kitsantas & Dabbagh, 2004). Although learner engagement is highly influential in the traditional learning settings, the online environment may require additional effort on the part of educators to implement different strategies, which can improve the effectiveness of course delivery and interpersonal relationships between the learners and instructors (Aladsani, 2022; Feekery & Condon, 2021).

Studies on learner engagement demonstrate a positive correlation between the implementation of educational technology and online learners' engagement. Chen and colleagues (2010) found a positive correlation between the use of learning technology, learner engagement, and achievement of learning outcomes. Moreover, a number of studies (such as those by Heiberger and Harper [2008] and Junco et al. [2011]) suggested that the use of social media platforms could boost learner engagement by improving communication and interpersonal and social connections. However, research demonstrates that retention among learners in the online environment is usually lower than in the traditional learning environments (Kahn et al., 2017). Additionally, Kahn and colleagues (2017) hypothesized that online learning settings stimulated reflexivity because students recognized the need of persistent practices and tangible acts in the face of uncertain and difficult circumstances.

There are issues related to learner engagement in online learning. For example, learner-to- learner engagement, learner-to-instructor engagement, and learner-to-content engagement (Martin & Bolliger, 2018). Despite conceptual and measurement problems with an increasing number of studies over the past ten years, the learner engagement debate is still in its infancy (Reschly & Christenson, 2012). In order to give educators a clear distinction between engagement facilitators and indicators and to give them the ability to build useful engagement measuring tools, researchers need to explain the theoretical conceptualization of the construct of learner engagement. In this context, engagement models like learner-to- learner, learner-to-instructor, and learner-to-content interactions are vital to take into consideration in traditional, blended, and online learning contexts (Skinner & Pitzer, 2012). Learner engagement in online learning needs further attention to students' social, cognitive, emotional, and pedagogical presences with different modes of communication and interaction (Kucuk & Richardson, 2019).

Methodology

This study is guided by the realist ontological assumption which considers the objectivity of the study results to construct knowledge from a study (Cohen et al., 2018). The epistemological assumption of this study is guided by a positivist paradigm to explore the objective truth of social reality in terms of learner engagement in an online learning context (Avelsson et al., 2022). A quantitative study method was adopted to explore the factors influencing undergraduate learner engagement in the online environment. An online questionnaire was sent to undergraduate students at one public and two private universities in the UAE as part of the quantitative study. Because of the time limitation, the researchers chose to adopt a cross-sectional study as it allowed for the collection of data from a student population in a short period of time, which was critical in this study (Cohen et al., 2018). Cross-sectional studies also have the advantage of increasing the chance of participation and make it easier to perform a study in an online mode.

Population and Sample

The purpose of this quantitative study was to explore undergraduate students' experiences with online/distance learning, investigate the factors that affect their engagement in the online environment, and determine whether this has any effect on their academic performance. Participants were undergraduate students enrolled in a variety of programs at three higher education institutions in the United Arab Emirates (UAE). Convenience sampling was adopted, and the participants were selected based on their availability and willingness to participate in the study (Scharrer & Ramasubramanian, 2021). As the survey was distributed

online via the participants' emails, a study sample was selected from the three universities depending on the availability of the learners' emails and their agreement to participate in the study. The online survey was sent to 1539 undergraduate students. The study sample consisted of 126 participants. Table 1 displays the distribution of the sample depending on the personal and functional variables. The male-to-female distribution is 52:48, respectively. The age distribution of the 126 respondents is 46.0%, 31.7%, 14.3%, and 7.9% for (18-22), (23-29), (30-35), and above 35, respectively. For the education level variable, over 40% of the respondents are fresh students in their first year at the university, whereas about 21% are in their third year of study.

Table 1

Distribution of Participants with Gender, Age, and Year of Study

Variable	Classification	Frequency	Percent %
Gender	Male	65	51.6
	Female	61	48.4
Age	18 – 22	58	46.0
	23 – 29	40	31.7
	30 – 35	18	14.3
	Above 35	10	7.9
Years of Study	First-year	51	40.5
	Second-year	25	19.8
	Third year	26	20.6
	Fourth year	24	19.0

Construction of the Questionnaire

The online survey questionnaire consisted of 24 elements and three sections (see Appendix A). The items of the study were created based on the literature review and the researchers' experiences in the online learning environment (Chiang et al., 2020). Data on the demographics of the graduate students, such as their gender, age, year of study, and major were gathered in the questionnaire's first section. Statements about the students' experiences in the online courses were included in the second section (Blackmon & Major, 2012; Yan et al., 2021). The third section included statements on the students' participation in online courses, the influence of the instructor's feedback, the impact of technology on students' engagement and motivation, and the importance of online activities (Gray & DiLoreto, 2016). The items of the survey in the second section were listed in statements based on a 4-point Likert scale with strongly agree (coded 1), agree (coded 2), disagree (coded 3), and strongly disagree (coded 4). The four key thematic constructions in the second section of the survey were *Learners' experience with online participation, Learners' engagement in online activities,* and *Collaboration and learning opportunities.* Altogether, 17 items were statistically analyzed from the questionnaire data as they were based on a 4-point Likert scale. Items from 18-24 were analyzed for their frequency.

Data Collection Procedure

The current study has received ethical approval from the United Arab Emirates University's Social Sciences Research Ethics Committee. Following their consent, participants

received information about the study. The significance of the study, the justification for choosing volunteers, and directions on how to access the online questionnaire were all thoroughly explained by the researchers. The participants were not required to disclose any identifying information, such as names, student IDs, or emails, to maintain confidentiality and anonymity (Singh & Sagar, 2021). In the cover letter, the participants were advised that participation in the study was entirely voluntary. Acceptance to continue and withdrawal choices were also offered at the beginning of the online survey in the cover letter. The data was collected from March to April 2022 in collaboration with each institution's Office of Student Affairs, which disseminated the online questionnaire.

Additionally, the survey was created using Google Forms, and all of the participants—undergraduate students from three colleges in the UAE (one public and two private universities)—were provided the link to the survey. By the end of the first week, 38 responses had been received. Two weeks later, a reminder email was sent to the students, increasing the response to 126 participants.

Validity and Reliability

To ensure validity and reliability of the research instrument, the survey was piloted in two phases. The survey was first conducted with a group of 14 graduate students for clarity, language, length, and ease of instruction. Following their feedback, minor adjustments were made to increase readability and comprehension. These changes included minor adjustments to the words used in the questions. For instance, question 3 asked about the influence of advanced technology without referring to positive or negative influences, which was found vague by the participants in the pilot study. Therefore, it was substituted by two questions (3 and 4) to reflect both the negative and positive influences that could be related to the use of advanced technology. Also, *option d* in question 24 was changed from "*online activities"* to "*pair activities"* based on the participants' suggestions. A second piloting procedure was conducted by sending the survey to undergraduate students at one university. The responses of 17 participants were recorded and used to make minor modifications to increase the validity of the survey questions (Cohen et al., 2018). These modifications included removing the midpoint option "*neutral*" from the Likert scale as 87% of the participants selected this option when it was available. This was meant to encourage the participants to reflect their "true opinion" rather than selecting the easiest available option (Chyung et al., 2017, p.3). The overall reliability for the second pilot survey was (0.70). This indicates an acceptable Cronbach's Alpha value for the piloting study as a Cronbach's Alpha value is acceptable if it is more than (0.60) (Cohen et al., 2018).

Data Analysis and Interpretation

To analyze the collected data, the researchers used applicable statistical tools with IBM SPSS (version 28) software. To ensure the validity and reliability of the data acquired from the study sample, the internal consistency of the study variables, as well as the reliability of the latent constructs, were measured using Cronbach's alpha test (Table 2). The confirmatory factor analysis (CFA) technique was also used to see how well the measured variables explicitly explained their corresponding latent structures.

Table 2
Reliability Coefficients for the Three Composite Variables and the Overall Scale

Reliability Statistics		
Dimension	Cronbach's Alpha	N of Items
Learners' experience with online participation	0.882	7
Learners' engagement in online activities	0.774	8
Collaboration and learning opportunities	0.630	2
Overall	0.767	24

Prior to performing the analytical tests, we employed Cronbach's alpha to assess the reliability of 24 components of the study's questionnaire. The overall reliability level ($\alpha = 0.767$) was found to be excellent with the study sample that showed increase in alpha value from the piloting of the questionnaire ($\alpha = 0.70$) (Table 2).

Factor analysis was conducted to identify the main thematic variables which emerged from the collected data. The 17 items in the questionnaire data were divided into three composite factors that reflected the main study variables: (1) *Learners' experience with online participation*, (2) *Learners' engagement in online activities*, and (3) *Collaboration and learning opportunities*. For each construct, the internal reliability was performed using Cronbach's alpha test. Table 2 shows Cronbach's alpha (internal reliability coefficient) values of 0.882 for *Online Participation*, 0.774 for *Engagement*, and 0.630 for *Collaboration*.

The researchers also conducted Kolmogorov-Smirnov and Shapiro-Wilk tests to test the data for normality. According to the Kolmogorov-Smirnov and Shapiro-Wilk tests of normality, the three variables that were related to undergraduate learners' engagement in the online environment were not normally distributed ($p < 0.05$). Therefore, the remaining tests were performed using non-parametric tests. The three thematic variables (dimensions) were tested using One Sample Non-Parametric Test, and two Independent Samples Non-Parametric tests were conducted on the independent variables (Mann-Whitney Test for *gender*, and Kruskal-Wallis Tests for *age-group* and *study year*) as these tests do not assume normality of the dependent variables, and hence they are free from any effects by the nature of distribution (Cohen et al., 2018). Based on the results from Kruskal-Wallis tests, Pair-wise Comparison test was conducted on one variable (*Learners' engagement in online activities*). Moreover, correlation and regression analysis were conducted to test the correlation among the three thematic variables. The remaining survey items (18-24) were tested for frequency and listed under the theme of *Learners' perceptions of online learning,* as they are categorical items which cannot be statistically tested.

Results

A total of 126 valid responses were received and qualified for data analysis. A snapshot of the demographic profile of the study sample, learners' experience with online participation, learners' engagement in online activities, and collaboration and learning opportunities are presented below. In addition to Cronbach's alpha test presented in Table 2, KMO and Bartlett's test were conducted to decide whether the collected data was plausible to conduct factor analysis. The KMO value indicates KMO = 0.813 which means that the data can render itself to conduct factor analysis. Data were analyzed through a normality test (Table 3), a one-sample Wilcoxon signed rank test (Tables 4–6), the independent samples Mann-Whitney test U-test gender (Table

7), the independent samples Kruskal-Wallis test across age ranges (Table 8) and comparison wise tests across age ranges (Table 9), correlations among the dimensions (Table 10), a generalized linear model for parameter estimates (Table 11), and the results of the participants' perceptions of online learning (Table 12).

The Kolmogorov-Smirnov and Shapiro-Wilk tests of normality for the variables in Table 3 showed that the three variables that were related to undergraduate learners' engagement in the online environment were not normally distributed ($p < 0.05$). Therefore, the comparison tests were performed using non-parametric tests (e.g., one-sample Wilcoxon signed rank test, Mann-Whitney U-test, and Kruskal-Wallis test).

Table 3

Test of Normality of Learners' Experience, Engagement, and Collaboration and Learning Opportunities.

	Kolmogorov-Smirnov[a]			Shapiro-Wilk		
Variables	**Statistic**	**Df**	**Sig.**	**Statistic**	**Df**	**Sig.**
Dim (1) Learners' experience with online participation	0.078	126	0.058	0.971	126	0.008
Dim (2) Learners' engagement in online activities	0.103	126	0.002	0.969	126	0.005
Dim (3) Collaboration and learning opportunities	0.144	126	<0.001	0.916	126	<0.001

The distribution of the three dimensions (*learners' experience with online participation, learners' engagement in online activities, and collaboration and learning opportunities*) showed that the median values vary across the three themes and from the ideal Likert-scale mid-value of 2.5. Moreover, the observed median for the second and the third theme was greater than the hypothesized median. Therefore, the one sample Wilcoxon signed rank tests were performed (Tables 4-6) to examine whether these differences were statistically significant. The following sections discuss the results for each theme area.

Table 4

One-sample Wilcoxon Signed Rank Test for Learners' Experience with Online Participation (test value = 2.5 from the 4-point Likert-scale Items).

Item/Variable	**N**	**Test Stat.**	**STD. Error**	**Standardized Test Stat.**	**Asymp. Sig.(2-sided test)**	**Obs. Median**
1. I find the online courses intellectually relaxing.	126	4669	396.843	1.685	0.092	3
2. I often feel motivated during online discussions.	126	4806	395.889	2.035	0.042	3
3. I often share learning materials with other	126	4536	396.158	1.352	0.176	3

classmates during online classes.						
4. Online classes provide the students with opportunities of meaningful learning experiences.	126	4095	396.406	0.238	0.812	2.5
5. I often feel more encouraged to participate in online classes than in traditional classes.	126	3523.5	394.963	-1.208	0.227	2
6. The use of advanced technology positively influences my participation during online classes.	126	4047	397.031	0.117	0.907	3
7. My previous learning experience influences my engagement in my current classes.	126	2722.5	389.421	-3.282	0.001	2
Dimension (1) Learners' experience with online participation	126	4240.5	410.024	0.585	0.558	2.57

Table 5

One-sample Wilcoxon Signed Rank Test for Learners' Engagement in Online Activities (test value = 2.5 from the 4-point Likert-scale Items).

Item/Variable	N	Test Stat.	STD. Error	Standardized Test Stat.	Asymp. Sig.(2-sided test)	Obs. Median
8. The use of advanced technology positively influences my participation during online classes.	126	7455	397.477	8.691	0.000	3
9. I often participate in online courses where the instructor gives the students the opportunity to participate in decision-making.	126	7047	395.889	7.695	<0.001	3
10. I often contribute to the class activities when the online course outcomes match my expectations.	126	6699	392.092	6.882	<0.001	3

11. I feel engaged in online classes when I have positive relationships with my colleagues.	126	7400.5	397.031	8.564	0.000	3
12. The instructor often provides me with effective (verbal/written) feedback.	126	7117	395.601	7.878	<0.001	3
13. I often pay full attention to the courses which I consider important for my future career	126	7767	397.349	9.479	0.000	4
14. My learning engagement is influenced by the availability of online resources related to my courses.	126	6555	392.563	6.507	<0.001	3
15. I often feel engaged in the classes where I am given the chance of independent learning.	126	6992	394.614	7.581	<0.001	3
Dimension (2) Learners' engagement in online activities	126	7429	390.86	9.409	0.000	3.13

Table 6

One-sample Wilcoxon Signed Rank Test for Collaboration and Learning Opportunities (test value = 2.5 from the 4-point Likert-scale Items).

Item/Variable	N	Test Stat.	STD. Error	Standardized Test Stat.	Asymp. Sig.(2-sided test)	Obs. Median
16. Collaboration with my classmates in group work is less effective in the online environment than in the face-to-face environment.	126	5705	396.158	4.303	<0.001	3
17. I often participate in classes that have opportunities for practical and real-life learning.	126	6954	395.889	7.46	<0.001	3
Dimension (3) Collaboration and learning opportunities	126	4383	285.433	6.509	<0.001	3

Learners' Experience with Online Participation

Table 4 shows the results of one-sample Wilcoxon signed rank test for learners' experience with online participation (test value = 2.5 from the 4-point Likert-scale items) in different higher education institutions in the UAE in the spring semester of the academic year 2021–2022. The results showed that the undergraduate students had mixed views of their experience with online participation. Their view of "*online courses intellectually relaxing*" was not statistically significant ($z = 1.685$, $p = 0.092 > 0.05$). Likewise, their views on "*Online classes provide the students with opportunities of meaningful learning experiences,*" "*use of advanced technology,*" and "*sharing learning materials with other classmates during online learning*" were all statistically insignificant at levels above 0.05 of significance. However, the participants' views on "*motivation during online discussions*" was statistically significant ($z = 2.035$, $p = 0.042 < 0.05$).

On the other hand, the undergraduate students had negative views in the following items. Their view "*encouragement to participate in online classes than in traditional classes*" was not statistically significant ($z = -1.208$, $p = 0.227 > 0.05$). However, their view regarding "*previous learning experience influences engagement in current classes*" was statistically significant ($z = -3.282$, $p = 0.001 < 0.05$). The overall composite scale level of learners' experience with online participation was statistically significantly positive ($z = 0.585$, $p = 0.558 > 0.05$) (Table 4).

An independent sample Mann-Whitney U-test (Table 7) for undergraduate student learners' experience with online participation showed that there was no statistically significant difference between the male and female students in terms of their experiences in participation in online classes (Female: Mean Rank = 58.63, n = 61; Male: Mean Rank = 68.07, n = 65; $z = -1.453$ and $p = 0.146 > 0.05$). Similarly, there was no statistically significant difference across age ranges of students in terms of their experience with online participation (Mean Rank = 2.57, n = 126; $z = 7.663$ and $p = 0.054 > 0.05$) (Table 8).

Learners' Engagement in Online Activities

Table 5 shows the results of the One-sample Wilcoxon signed rank test for learners' engagement in online activities (test value = 2.5 from the 4-point Likert-scale items), in higher education institutions in the UAE in the spring semester of the academic year 2021–2022. The results showed that the undergraduate students had positive views of their engagement in online activities. Their view "*pay full attention to the courses which I consider important for my future career*" was statistically significant ($z = 9.479$, $p = 0.000 < 0.05$). Likewise, their views on "*use of advanced technology,*" "*positive relationships with my colleagues,*" "*contribute to the class activities when the online course outcomes match my expectations,*" "*effective (verbal/written) feedback,*" "*the availability of online resources related to my courses,*" "*chances of independent learning,*" and "*the opportunity to participate in decision-making*" were all statistically significant at the 0.05 level of significance. The overall composite scale level of learners' engagement in online activities was statistically significantly positive ($z = 9.409$, $p = 0.000 < 0.05$) (Table 5).

An independent sample Mann-Whitney U-test (Table 7) for undergraduate student learners' engagement in online activities showed that there was no statistically significant difference between the male and female students in terms of their engagement in online activities (Female: Mean Rank = 60.13, n = 61; Male: Mean Rank = 66.66, n = 65; $z = -1.008$ and $p = 0.314 > 0.05$). Similarly, there was no statistically significant difference across age

ranges of students in terms of their experience with online participation (Mean Rank = 3.12, n = 126; z = 12.487 and p = 0.006> 0.05) (Table 8).

Collaboration and Learning Opportunities

Table 6 displays the results of the One-sample Wilcoxon signed rank test for collaboration and learning opportunities (test value = 2.5 from the 4-point Likert-scale items), in higher education institutions in the UAE in the spring semester of the academic year 2021–2022. The results showed that the undergraduate students had positive views of their collaboration in online activities. The participants' view on the effectiveness of their collaboration with their classmates in group work in online and face-to-face environments was statistically significant (z = 4.303, p = 0.001 < 0.05). Likewise, their views on "*participate in classes that have opportunities for practical and real-life learning*" was also statistically significant at the 0.05 level of significance. The overall composite scale level of learners' collaboration and learning opportunities was statistically significantly positive (z = 6.509, p = 0.001 < 0.05) (Table 6).

Table 7

Independent Samples Mann-Whitney U-Test (Gender)

Statistic	**Learners' experience with online participation**	**Learners' engagement in online activities**	**Collaboration and learning opportunities**
Total N	126	126	126
Mann-Whitney U	1685.500	1777.000	2224.500
Wilcoxon W	3576.500	3668.000	4115.500
Mean Rank (Female, N=61)	58.63	60.13	67.47
Mean Rank (male, N=65)	68.07	66.66	59.78
Test Statistic	1685.500	1777.000	2224.500
Standard Error	204.454	203.913	199.942
Standardized Test Statistic	-1.453	-1.008	1.210
Asymptotic Sig.(2-sided test)	0.146	0.314	0.226

An independent sample Mann-Whitney U-test (Table 7) for undergraduate student learners' collaboration in learning opportunities showed that there was no statistically significant difference between the male and female students in terms of their engagement in online activities (Female: Mean Rank = 67.47, n = 61; Male: Mean Rank = 59.78, n = 65; z = 1.210 and p = 0.226 > 0.05). Similarly, there was no statistically significant difference across age ranges of students in terms of their experience with collaboration and learning opportunities during online learning (Mean Rank = 3.0, n = 126; z = 2.647 and p = 0.449> 0.05) (Table 8).

Table 8

Independent Samples Kruskal-Wallis Test (across age ranges)

Statistic	Learners' experience with online participation	Learners' engagement in online activities	Collaboration and learning opportunities
Total N	126	126	126
Test Statistic	7.663	12.487	2.647
Median	2.57	3.12	3.0
Degree Of Freedom	3	3	3
Asymptotic Sig.(2-sided test)	0.054	0.006	0.449

As Table 8 indicated significant differences in the result of Kruskal-Wallis for one variable (*Learners' engagement in the online activities*), a pair-wise comparison across age groups test for this variable was conducted to examine which three pairs of age groups had a significant difference (Table 9).

Table 9

Pair-Wise Comparisons of Age Groups in Relation to Learner Engagement in Online Activities

Sample 1 – Sample 2	Test Statistics	Std. Error	Std. Test Statistics	Sig.	Adj. Sig. [a]
18 – 22 -23 – 29	-20.391	7.471	-2.729	0.006	0.038
18 – 22 -30 – 35	-22.687	9.808	-2.313	0.021	0.124
18 – 22 -Above 35	-30.103	12.447	-2.419	0.016	0.093
23 – 29 -30 – 35	-2.296	10.317	-0.223	0.824	1.000
23 – 29 -Above 35	-9.713	12.852	-0.756	0.450	1.000
30 – 35 -Above 35	-7.417	14.337	-0.517	0.605	1.000

Each row tests the null hypothesis that the Sample 1 and Sample 2 distributions are the same. Asymptotic significances (2-sided tests) are displayed. The significance level is 0.050. Significance values have been adjusted by the Bonferroni correction for multiple tests.

The findings indicate that age group *18-22* was significantly different from the age groups *23-29*/ *30-35* / *above 35* at the significance level 0.05 in relation to the variable *learners' engagement in the online activities*. The difference between age groups *18-22* and *23-29* was significant at (sig. $p = 0.006 < 0.05$). Moreover, the difference between age groups *18-22* and *30-35* was significant at (sig. $p = 0.021 < 0.05$) whereas the difference between age groups *18-22* and *above 35* was significant at (sig. $p = 0.016 < 0.05$). Other age groups did not display significant difference at the same level of significance 0.05 (Table 9).

Table 10

Correlation (2-tailed) between the Different Dimensions (Experience, Engagement, and Collaboration)

			Dim.1 (Experience)	Dim.2 (Engagement)	Dim.3 (Collaboration)
Spearman's rho	Dim.1 (Experience)	Correl. Coeff.	1.000	0.025	-0.405**
		Sig. (2-tailed)	.	0.778	<0.001
		N	126	126	126
	Dim. 2 (Engagement)	Correl. Coeff.	0.025	1.000	0.188*
		Sig. (2-tailed)	0.778	.	0.035
		N	126	126	126
	Dim. 3 (Collaboration)	Correl. Coeff.	-0.405**	0.188*	1.000
		Sig. (2-tailed)	<0.001	0.035	.
		N	126	126	126

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

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

Additionally, the three emerging dimensions, learners' experience with online participation, learners' engagement in online activities, and their collaboration and online opportunities were tested for possible correlations among them (Table 10). The results indicate that there is a significant correlation between the participants' experience with online participation and their collaboration and online opportunities (sig. $p = 0.001 < 0.05$) (Table 10). Similarly, a significant correlation between the learners' engagement and their collaboration was found (sig. $p = 0.035 < 0.05$). On the other hand, there is no significant correlation between the learners' engagement and their experience with online participation.

The undergraduate learners' experience with online participation was found to be significantly impacted only by the learners' collaboration and learning opportunities ($B = -0.402$, $p < 0.001 < 0.05$). The other independent variables which include the learners' study year, age range, gender, and engagement were not found to impact the learners' experience with online participation as indicated in (Table 11).

Table 11

Generalized Linear Model for Independent Variables (Study Year, Age Range, Gender, Engagement, and Collaboration) and the Learners' Experience with Online Participation as Dependent Variable

	Parameter Estimates						
	Unstandardized Coefficients		Standardized Coefficients			95.0% Confidence Interval for B	
Model	B	Std. Error	Beta	T	Sig.	Lower Bound	Upper Bound
(Constant)	4.090	0.555		7.364	<0.001	2.990	5.190
Year of Study	-0.029	0.058	-0.044	-0.497	0.620	-0.143	0.086
Age Range	0.141	0.074	0.175	1.910	0.059	-0.005	0.286
Gender	-0.119	0.126	-0.078	-0.947	0.346	-0.368	0.130
Dim2 (Engagement)	-0.117	0.153	-0.068	-0.760	0.449	-0.420	0.187
Dim3 (Collaboration)	-0.402	0.087	-0.387	-4.606	<0.001	-0.575	-0.229

a. Dependent Variable: Dim1 (Learners' experience)

Discussion

The overall composite scale level of learner engagement in the online learning environment was statistically significantly positive ($z = 9.409$, $p = 0.00 < 0.05$). This finding indicates that the undergraduate learners were engaged during the online activities in the learning process through a variety of opportunities, technologies, and means of effective pedagogical resources which enhanced their active engagement in the online environment. This finding is consistent with the expectation in an online engagement framework (Chen et al., 2010; Redmond et al., 2018). The online learning experiences with meaningful engagement of students in higher education might have been enhanced due to the effective organization and access of learning management system implemented in undergraduate and graduate programs (Coates, 2006). The utilization of technology has been identified as an essential factor in promoting learner engagement, investment, and satisfaction among the learners in the online environment (Carroll et al., 2021; Chen et al., 2010; Czerkawski & Lyman, 2016). The findings revealed several factors that were statistically significant and thus had a positive impact on the participants' engagement levels. These findings agree with those of Fabian et al. (2022). These factors include the utilization of advanced technology, effective instructor feedback, availability of online resources, opportunities for practical and independent learning, and learner participation in decision making (Dixson, 2015; Fredricks & McColskey, 2012). These findings also coincide with previous studies (Appleton et al., 2006; Blumenfeld et al., 2005; Mahatmya et al., 2012) which emphasized the importance of these factors to enhance the learners' engagement in different class modes.

Although learner engagement has been proven to be of paramount influence on the academic achievement of learners during the online classes (Carroll et al., 2021; Halverson & Graham, 2019; Khan et al., 2021), the learners' previous learning experiences had a statistically negative significance on their level of engagement in the online environment. This finding is not consistent with the results found by Hiver et al.(2020) which indicated that the learners' previous experiences positively influenced their engagement in their classes. The result from this item further suggests that the participants are less motivated to participate in online classes, according to the research (Coates, 2006). This outcome is consistent with the findings of a study by Kahn et al. (2017), which revealed that learners had trouble participating in online classrooms since there were no prolonged practices or tangible actions taken in uncertain and complex situations. The learners might have low motivation in online learning and engagement might be due to lack of personal attention and individualized care through the learning system (Pugh, 2019).

Similarly, the overall scale level of learner collaboration and online opportunities was statistically significantly positive ($z = 6.509$, $p < 0.001 < 0.05$) which indicates that online collaboration and real-life learning opportunities positively influence learner engagement in the online environment. This finding coincides with the results reported by Kahn et al.(2017) which also found positive correlations between these two variables.

Nonetheless, the overall scale level of the participants' experience with online participation was not found to be statistically significant ($z = 0.585$, $p = 0.558 > 0.05$). This indicates that the participants had conflicting opinions about the influence of their participation in online activities on their engagement during online classes. The different opinions might have originated due to different perceived experiences of social, cognitive, and pedagogical presence in online mode during the COVID-19 pandemic (Dixson, 2015). While the participants felt motivated during online discussions, their responses indicated that they had mixed opinions about online classes providing opportunities for meaningful learning experiences. They also had

contradictory views about the impact of sharing learning materials with their classmates. This result is consistent with Wang (2008) and Upadhayaya (2021) in the sense that learners in higher education may have different experiences of sharing and negotiating leading to contradicting views (Omar et al., 2021). In addition, the findings revealed that the participants found the courses with outcomes that match their expectations to be more engaging than other courses. Furthermore, the findings indicate that the participants believe that their engagement level increases when they have positive relationships with their colleagues. These findings also coincide with the results indicated by previous studies (Martin & Bolliger, 2018; Skinner & Pitzer; 2012). These findings could be related to the fact that the learners need to feel more connected with their colleagues during the online classes as they mostly feel isolated behind the screens. Another factor which plays a role here is the fear of embarrassment which could hinder many learners from participation if they do not have positive relationships with their colleagues. The importance of positive relationships among the learners and their colleagues has been emphasized in research as there is a great impact of the social presence of learners in different contexts on their learning and academic achievement in higher education institutions (Skinner & Pitzer, 2012).

The undergraduate learners' perceptions of the factors influencing their engagement in the online environment varied across questions. While some participants indicated the importance of their relationships with their instructors and colleagues, 38.9% of them viewed that their self-confidence constitutes the major factor that determines their participation in online classes. This result could be attributed to the importance of self-confidence in the online environment, as there are few opportunities for communication among online students. This may exacerbate the tension caused by not meeting their partners and colleagues in person. Similarly, the participants indicated the importance of collaborative work, as 42.1% indicated that collaborative work improves their motivation, and 44.4% indicated that it improves their participation in the classroom. Collaboration in the online environment is clearly valued by participants and is considered to have a significant impact on their engagement levels and learning experience (Coates, 2006; Dixson, 2015; Redmond et al., 2018). Another factor that was highlighted by the participants is the instructor's feedback which was viewed as a factor that improves the participants' learning experience by 50.8% of the participants. These results coincide with the findings of previous studies (Martin & Bolliger, 2018; Skinner & Pitzer, 2012) which found a positive correlation between healthy learning environments and positive relationships among the learners and between the learners and their instructors. They also coincide with what was found by earlier studies (Arghode et al., 2018; Schell et al., 2013) that positive and timely feedback provided by the instructors helps to increase the levels of learner engagement.

Positive communication and relationships in the learning environment have been viewed as significant predictors of academic achievement. These achievements could be related to academic gains, self-confidence, participation, creativity, and collaboration among learners (Alawamleh et al., 2020). The undergraduate learners' experience with online participation was found to be significantly impacted by the learners' collaboration and learning opportunities which indicates that the quality of the learners' experience in the online environment can be predicted by the level of their collaboration and the learning opportunities provided for them in online classes (Redmond et al., 2018). The social and collaborative engagement with their peers and teachers were not effective or not engaging to several undergraduate students. This finding is consistent with Read (2020) in which they reported 78% of research participants found online

classes not engaging due to lack of collaboration (as cited in Hollister et al., 2022). Collaborative engagement with student-student and student-teacher interaction may foster "a sense of community, which is often correlated with more effective learning outcomes" (Hollister et al., 2022, p. 2).

The findings of the study are also related to learner engagement frameworks created by researchers (Carroll et al., 2021; Fredricks et al, 2004) which indicate the main dimensions of learner engagement. In this study, three of these dimensions—behavioral, emotional, and social—were put to the test. These three factors—participation, collaboration, self-confidence, relationships with peers and teachers, perceptions of the learning process, and the impact of their learning environment on their engagement levels—are all clearly reflected in the study's findings. An appropriate framing of learner engagement in online, offline, and face-to-face learning should be assessed in order to develop congenial and effective teaching and learning in higher education, whether in crises or normal situations (Kahu, 2013), in order to create a positive impact on student's academic performance (Rajabalee et al., 2020). The findings of the study as discussed above could be different in the pre-COVID context or the post-COVID context, as many students and teachers were forced to take online classes Therefore, the implications of the study should be considered in the context of the COVID-19 pandemic, which forced students and teachers to turn to online teaching and learning as the only means to continue education in the UAE and other countries in 2020 and 2021.

Implications

The significance of this study lies in the fact that it provides insight into the factors that influence learner engagement in the online undergraduate context. Although few studies have investigated learner engagement in higher education in the online learning environment in the region (Omar et al., 2021), this study presented an overview of the factors that influence learner engagement in the online learning from a different perspective including the learners' participation, collaboration, and learning experiences. The findings derived from this study provide evidence of the importance of learner engagement in improving the undergraduate learners' experience and investment in the online learning process. The generalized linear model revealed that the undergraduate learners' demographics had no significant impact on the levels of their engagement and participation in online activities. Nonetheless, the learners' collaboration, relationships with their colleagues, and utilization of advanced technology in online classes had an impact on their level of engagement and learning experience. Moreover, the findings suggest that effective feedback provided by the instructors plays an important role in improving learner engagement in online undergraduate classes. These findings are consistent with the findings in Coates (2006) and Halverson and Graham (2019). Therefore, it is essential to provide undergraduate learners with meaningful collaborative opportunities during the online activities as collaboration would lead to positive relationships among the learners and their colleagues and provide them with opportunities to increase their learner engagement. Moreover, advanced technologies and effective educational online platforms are to be utilized to improve the meaningful, purposeful, and authentic learning experience of the undergraduate learners. Furthermore, instructors need to provide effective feedback which allows the students to learn without negatively influencing their self-confidence (Coates, 2006). Effective feedback strategies would increase learners' interest in the learning material and their engagement levels. These strategies include the need to build effective communication channels between the instructors

and the learners in a way that builds positive relationships, trust, and satisfaction within the learning environment.

Limitations of the Study

Despite the significance of the study results in providing support for available research about the factors that influence learner engagement in the region, few limitations are present in the study due to different constraints. First, the limited number of the participants might not reflect the perceptions of the entire population of undergraduate learners in different higher education institutions available not only in the country, but also in the region. Second, the researchers needed to adopt convenience sampling due to communicative constraints and the limitations related to reaching out to different groups of participants in different colleges and study majors. This could have influenced the study sample by obtaining responses from specific groups rather than a representative sample of the entire population. Third, the emotional dimension of learner motivation was not investigated in this study as the focus was on the three dimensions related to the cognitive, behavioral, and social dimensions of learner engagement. This was due to the nature of the survey questions which constitutes the fourth limitation of the study. The nature of the questions in the designed survey includes Likert scale items which, though helpful in providing a statistical measure for the factors related to the variables, do not provide an insight into the reasons or motives behind the participants' responses. As a result, a mixed methods approach would have provided more insight into the learners' perceptions and views on the factors influencing their engagement and experience in the online environment. The fifth limitation is related to the categorical items that were included in the survey. These items, though analysed for their frequency, were not included in the factor analysis and statistical tests which were conducted on the rest of the items. Although the data collected from these items is important, it was not tested from a statistical significance viewpoint. The final limitation of this study is related to the context of the study. The study was conducted at a time when all face-to-face classes were closed due to the COVID-19 pandemic, and students and teachers were forced to continue teaching and learning in online mode. Therefore, the students' experiences of engagement in learning might have been significantly impacted by the lack of prior experiences in online learning and faculty members not being well prepared to engage students.

Recommendations and Conclusion

This study investigated the various factors that influence undergraduate learner engagement in the online environment in three higher education institutions in the UAE. A sample of 126 undergraduate students participated in the study by responding to an online survey. Statistical analysis was conducted on the collected data using IBM SPSS-28. Data analysis included non-parametric one-sample Wilcoxon signed rank test, independent samples Mann-Whitney U-test, independent samples Kruskal-Wallis test, and generalized linear model test. The findings revealed three main variables that were applicable to statistical analysis and one variable which was derived from the participants' responses to the categorical survey items. Collaboration, real opportunities for online activities, the use of advanced technologies, effective instructor feedback, and positive relationships between participants and their colleagues and instructors were found to influence the participants' engagement levels. The study also provides further evidence of the dynamicity and complexity of the construct of learner engagement in the online environment.

As the online learning environment is influenced by many variables that may impact learners' academic achievement and engagement levels, it is recommended that instructors in different higher education institutions are provided with the required professional training that assists them to establish effective communication channel between them and the learners. Appropriate training is also required to equip instructors and educators at different levels with the best online teaching strategies that emphasize the utilization of authentic and practical content and effective, timely feedback which facilitates the learning process and maximizes learner attainment. Moreover, educators and other stakeholders should invest in leveraging efficient and cutting-edge educational technology and platforms, which are thought to be essential in improving learner engagement levels and the learning experience as a whole. In order to better understand how students perceive the aspects that affect their engagement and learning experience, future studies could focus on including a wider sample of students in higher education from a variety of levels, majors, and environments. Further research could use a mixed methods approach to gain a deeper understanding of the learners' perceptions, which could then be compared to findings from other studies conducted in different regions and learner levels. More specifically, a future study is recommended with a larger sample size involving both public and private higher education institutions. To overcome the limitation due to convenience sampling, we recommend that stratified random sampling be adopted, including higher education institutions from different regions or Emirates within the UAE and even across the Gulf Cooperation Council (GCC) countries. We also recommend that future studies should include behavioral, cognitive, social, emotional, contextual, and technological dimensions of student engagement in online learning as independent variables and their impact on student achievement as a dependent variable. Finally, we would like to recommend ongoing faculty development and training for online teaching and learning in order to provide students with meaningful and impactful learning experiences through greater and positive engagement in various modes of virtual interaction, learning, sharing, and supporting one another.

Acknowledgments

We would like to acknowledge that the study was a part of PhD course assignment for *Curr 710 Quantitative Research Methods in Education* instructed and supervised by the third author at the College of Education, United Arab Emirates University, Al Ain, Abu Dhabi, United Arab Emirates.

Declarations

Authors declare no conflict of interest in publishing this article.

Authors 1 and 2 had an equal contribution in developing this manuscript. Therefore, both should be regarded as first authors of this article.

The research was approved by Research Ethics Committee of Office of Research, United Arab Emirates University (Ref# ERS_2022_8472).

References

Ainley, M. (2012). Students' interest and engagement in classroom activities. In S. L. Christenson, A. L. Reschly, & C. Wylie (Eds.), *Handbook of research on student engagement* (pp. 283-302). Springer.

Akbari, E., Naderi, A., Simons, R. J., & Pilot, A. (2016). Student engagement and foreign language learning through online social networks. *Asian-Pacific Journal of Second and Foreign Language Education*, *1*(1), 1-22. https://doi.org/10.1186/s40862-016-0006-7

Aladsani, H. K. (2022). A narrative approach to university instructors' stories about promoting student engagement during COVID-19 emergency remote teaching in Saudi Arabia. *Journal of Research on Technology in Education*, *54*(1), https://doi.org/10.1080/15391523.2021.1922958

Alawamleh, M., Al-Twait, L. M., & Al-Saht, G. R. (2020). The effect of online learning on communication between instructors and students during Covid-19 pandemic. *Asian Education and Development Studies*, *11*(2), 380-400. https://doi.org/10.1108/AEDS-06-2020-0131

Alharbi, M. A. (2019). Integration of video in teaching grammar to EFL Arab learners. *CALL-EJ, 20*(1), 135-153. http://callej.org/journal/20-1/Alharbi2019.pdf

Albion, P. R. (2014). From creation to curation: Evolution of an authentic "assessment for learning" task. In L. Liu, D. Gibson, V. Brown, T. Cavanaugh, J. Lee, C. Maddux, M. Ochoa, M. Ohlson, D. Slykhuis, & J. Voogt (Eds.), *Research highlights in technology and teacher education* (pp. 69–78). Waynesville, NC: AACE.

Al Mahdawi, M., Senghore, S., Ambrin, H., & Belbase, S. (2021). High school students' performance indicators in distance learning in chemistry. *Education Sciences, 11*(11), 672. https://doi.org/10.3390/educsci11110672

Appleton, J. J., Christenson, S. L., Kim, D., & Reschly, A. L. (2006). Measuring cognitive and psychological engagement: Validation of the student engagement instrument. *Journal of School Psychology*, *44*(5), 427-445. https://doi.org/10.1016/j.jsp.2006.04.002

Arghode, V., Brieger, E., & Wang, J. (2018), Engaging instructional design and instructor role in online learning environment, *European Journal of Training and Development*, *42*(7/8), 366-380. https://doi.org/10.1108/EJTD-12-2017-0110

Avelsson, M., Sandberg, J., & Einola, K. (2022). Reflexive design in qualitative research. In U. Flick (Ed.), *The SAGE handbook of qualitative research design* (pp. 23-40). SAGE publications.

Barkley, E. F., & Major, C. H. (2020). *Student engagement techniques: A handbook for college faculty* (2nd ed.). John Wiley & Sons.

Berry, L. A., & Kowal, K. B. (2022). Effect of role-play in online discussions on student engagement and critical thinking. *Online Learning, 26*(3), 4-21. http://dx.doi.org/10.24059/olj.v26i3.3367

Blackmon, S. J., & Major, C. (2012). Student experiences in online courses: A qualitative research synthesis. *The Quarterly Review of Distance Education, 13*(2), 77-85.

Blumenfeld, P., Modell, J., Bartko, W. T., Secada, W. G., Fredricks, J. A., Friedel, J., & Paris, A. (2005). School engagement of inner-city students during middle childhood. In C. R. Cooper, C. T. G. Coll, W. T. Bartko, H. Davis, & C. Chatman (Eds.), *Developmental pathways through middle childhood: Rethinking contexts and diversity as resources* (145-170). Lawrence Earlbaum Associates.

Carroll, M.B., Lindsey, S., Chaparro, M., & Winslow, B. (2021). An applied model of learner engagement and strategies for increasing learner engagement in the modern educational environment. *Interactive Learning Environments, 29*(5), 757-771. https://doi.org/10.1080/10494820.2019.1636083

Cavanagh, R. F. (2015). A unified model of student engagement in classroom learning and classroom learning environment: One measure and one underlying construct. *Learning Environment Research, 18*, 349-361. https://doi.org/10.1007/s10984-015-9188-z

Chen, P. S. D., Lambert, A. D., & Guidry, K. R. (2010). Engaging online learners: The impact of web-based learning technology on college student engagement. *Computers & Education*, *54*(4), 1222-1232. https://doi.org/10.1016/j.compedu.2009.11.008

Chiang, I. A., Jhangiani, R. S., & Price, P. C. (2020). *Research methods in psychology* (2nd ed.). BCcampus.

Christenson, S. L., Reschly, A. L., Appleton, J. J., Berman, S., Spanjers, D., & Varro, P. (2008). Best practices in fostering student engagement. In A. Thomas, & J. Grimes (Eds.), *Best practices in school psychology V* (pp. 1099-1120). National Association of School Psychologists.

Chyung, S. Y., Roberts, K., Swanson, I., & Hankinson, A. (2017). Evidence-based survey design: The use of a midpoint on the Likert scale. *Performance Improvement*, *56*(10), 15-23. https://doi.org/10.1002/pfi.21727

Coates, H. (2006). *Student engagement in campus-based and online education: University connections.* New York, NY: Routledge.

Cohen, L., Manion, L., and Morrison, K. (2018). *Research methods in education* (8th Ed.). Routledge.

Conrad, R. M., & Donaldson, J. A. (2011). *Engaging the online learner: Activities and resources for creative instruction* (Vol. 38). Jossey-Bass.

Crick, D. R., & Goldspink, C. (2014). Learner dispositions, self-theories and student engagement. *British Journal of Educational Studies, 62*(1), 19–35. https://doi.org/10.1080/00071005.2014.904038

Czerkawski, B. C., & Lyman, E. W. (2016). An instructional design framework for fostering student engagement in online learning environments. *TechTrends, 60*(6), 532-539. https://doi.org/10.1007/s11528-016-0110-z

Dahalan, N., Omar, Hassan, H., Atan, H. (2012). Student engagement in online learning: Learners attitude toward e-mentoring. *Procedia – Social and Behavioral Sciences, 67*, 464-475. https://doi.org/10.1016/j.sbspro.2012.11.351

Dahleez, K. A., El-Saleh, A. A., Al Alawi, A. M., & Abdelfattah, F. A. (2021), Higher education student engagement in times of pandemic: the role of e-learning system usability and teacher behavior. *International Journal of Educational Management*, *35*(6), 1312-1329. https://doi.org/10.1108/IJEM-04-2021-0120

DeVito, M. (2016). *Factors influencing student engagement* (Unpublished Certificate of Advanced Study Thesis). Sacred Heart University, Fairfield, CT. https://digitalcommons.sacredheart.edu/cgi/viewcontent.cgi?article=1010&context=edl

Deng, R., Benckendorff, P., & Gannaway, D. (2020). Learner engagement in MOOCs: Scale development and validation. *British Journal of Educational Technology, 51*(1), 245–262. https://doi.org/10.1111/bjet.12810

Dixson, M. D. (2015). Measuring student engagement in the online course: The online student engagement scale (OSE). *Online Learning, 19*(4), 1-15. https://doi.org/10.24059/olj.v19i4.561

Fabian, K., Smith, S., Taylor-Smith, E., & Meharg, D. (2022). Identifying factors influencing study skills engagement and participation for online learners in higher education during COVID-19. *British Journal of Educational Technology, 53*, 1915-1936. https://doi.org/10.1111/bjet.13221

Feekery, A. J., & Condon, S. M. (2021). A response to covid-19: recognizing subcultures in the unexpected online student cohort. *Frontiers in Communication*, *6*, 642275. https://doi.org/10.3389/fcomm.2021.642275

Finn, J. D., & Zimmer, K. S. (2012). Student engagement: What is it? Why does it matter? In S. L. Christenson, A. L. Reschly, & C. Wylie (Eds.), *Handbook of research on student engagement* (pp. 97–131). Springer.

Fredricks, J. A., Blumenfeld, P. C., & Paris, A. H. (2004). School engagement: Potential of the concept, state of the evidence. *Review of Educational Research, 74*(1), 59-109. https://doi.org/10.3102%2F00346543074001059

Fredricks, J. A., & McColskey, W. (2012). The measurement of student engagement: A comparative analysis of various methods and student self-report instruments. In S. Christenson, A. Reschly, & C. Wylie (Eds.), *Handbook of research on student engagement* (pp. 763–782). Springer. https://doi.org/ 10.1007/978-1-4614-2018-7_37

Gallagher, T. L., Bennett, S., Keen, D., & Muspratt, S. (2017). Examining learner engagement strategies: Australian and Canadian teachers' self-report. *Teacher Education and Special Education, 40*(1), 51-64. https://doi.org/10.1177/0888406416654213

Gray, J. A., & DiLoreto, M. (2016). The effects of student engagement, student satisfaction, and perceived learning in online learning environments. *NCPEA International Journal of Educational Leadership Preparation, 11*(1), 1-20. https://www.ncpeapublications.org/index.php/volume-11-number-1-spring-2016

Halverson, L. R., & Graham, C. R. (2019). Learner engagement in blended learning environments: A conceptual framework. *Online Learning, 23*(2). 145-178. https://doi.org/10.24059/olj.v23i2.1481

Hasan, N., & Bao, Y. (2020). Impact of "e-learning crack-up" perception on psychological distress among college students during COVID-19 pandemic: A mediating role of "fear of academic year loss." *Children and Youth Services Review, 118*, 105355. https://doi.org/10.1016/j.childyouth.2020.105355

Heiberger, G., & Harper, R. E. (2008). Have you Facebooked Astin lately? Using technology to increase student involvement. *New Directions for Student Services, 2008*(24), 19-35. https://doi.org/10.1002/ss.293

Henrie, C. R., Halverson, L. R., & Graham, C. R. (2015). Measuring student engagement in technology-mediated learning: A review. *Computers & Education, 90*, 36-53. https://doi.org/10.1016/j.compedu.2015.09.005

Hiver, P., Al-Hoorie, A. H., Vitta, J. P., & Wu, J. (2021). Engagement in language learning: a systematic review of 20 years of research methods and definitions. *Language Teaching Research, 13,* 1-30. https://doi.org/10.1177%2F13621688211001289

Hiver, P., Zhou, S. A., Tahmouresi, S., Sang, Y., & Papi, M. (2020). Why stories matter: Exploring learner engagement and metacognition through narratives of the L2 learning experience. *System*, *91*, 102260. https://doi.org/10.1016/j.system.2020.102260

Hollister, B., Nair, P., Hill-Lindsay, S., Chukoskie, L. (2022). Engagement in online learning: Student attitudes and behavior during COVID-19. *Frontiers in Education, 7*, 851019. https://doi.org/10.3389/feduc.2022.851019

Johnson, M. L., & Sinatra, G. M. (2013). Use of task-value instructional inductions for facilitating engagement and conceptual change. *Contemporary Educational Psychology*, *38*(1), 51-63. https://doi.org/10.1016/j.cedpsych.2012.09.003

Junco, R., Heiberger, G., & Loken, E. (2011). The effect of Twitter on college student engagement and grades. *Journal of Computer Assisted Learning*, *27*(2), 119-132. https://doi.org/10.1111/j.1365-2729.2010.00387.x

Kahn, P., Everington, L., Kelm, K., Reid, I., & Watkins, F. (2017). Understanding student engagement in online learning environments: The role of reflexivity. *Educational Technology Research and Development, 65*(1), 203-218. https://doi.org/10.1007/s11423-016-9484-z

Kahu, E. R. (2013). Framing student engagement in higher education. *Studies in Higher Education, 38*(5), 758–773. https://doi.org/10.1080/03075079.2011.598505

Khan, M. A., Nabi, M. K., Khojah, M., & Tahir, M. (2021). Students' perception towards e-learning during COVID-19 pandemic in India: An empirical study. *Sustainability*, *13*(1), 57. https://doi.org/10.3390/su13010057

Kitsantas, A., & Dabbagh, N. (2004). Supporting self-regulation in distributed learning environments with web-based pedagogical tools: An exploratory study. *Journal on Excellence in College Teaching*, *15*(1), 119-142. https://www.learntechlib.org/p/157968/.

Kucuk, S., & Richardson, J. C. (2019). A structural equation model of predictors of online learners' engagement and satisfaction. *Online Learning, 23*(2), 196-216. https://doi.org/1024059/olj.v23i2.1455

Lambert, C., Philp, J., & Nakamura, S. (2017). Learner-generated content and engagement in second language task performance. *Language Teaching Research, 21*(6), 665-680. https://doi.org/10.1177%2F1362168816683559

Mahatmya, D., Lohman, B. J., Matjasko, J. L., & Farb, A. F. (2012). Engagement across developmental periods. In S. L. Christenson, A. L. Reschly, & C. Wylie (Eds.), *Handbook of research on student engagement* (pp. 45-63). Springer.

Maraqa, M. A., Hamouda, M., El-Hassan, H., El-Dieb, A. S., & Hassan, A. A. (2022). Transitioning to online learning amid COVID-19: Perspectives in a civil engineering program. *Online Learning, 26*(3), 169-201. http://dx.doi.org/10.24059/olj.v26i3.2616

Martin, F. & Bolliger, D.U. (2018). Engagement matters: Student perceptions on the importance of engagement strategies in the online learning environment. *Online Learning, 22*(1), 205-222. https://doi.org/10.24059/olj.v22i1.1092

Mercer S. (2019). Language learner engagement: Setting the scene. In: Gao X. (Eds.) *Second Handbook of English Language Teaching* (pp. 643-660). Springer International Handbooks of Education. Springer, Cham. https://doi.org/10.1007/978-3-030-02899-2_40

Mosleh, S. M., Shudifat, R. M., Dalky, H. F., Almalik, M. M., & Alnajar, M. K. (2022). Mental health, learning behavior and perceived fatigue among university students during the COVID-19 outbreak: A cross-sectional multicentric study in the UAE. *BMC Psychology, 10*, 47. https://doi.org/10.1186/s40359-022-0758-z

Nazamud-din, A., Zaini, M. H., & Jamil, N. H. M. (2020). The relationship of affective, behavioral and cognitive engagement in ESL higher learning classroom. *English Language Teaching and Linguistics Studies, 2*(4), 48-64. https://doi.org/10.22158/eltls.v2n4p48

Ogunyemi, A. A., Quaicoe, J. S., & Bauters, M. (2022). Indicators for enhancing learners' engagement in massive open online courses: A systemic review. *Computers and Education Open, 3*, 100088. https://doi.org/10.1016/j.caeo.2022.100088

Omar, H.A.; Ali, E.M.; Belbase, S. (2021). Graduate Students' Experience and Academic Achievements with Online Learning during COVID-19 Pandemic. *Sustainability, 13*(23), 13055. https://doi.org/10.3390/su132313055

Oraif, I., & Elyas, T. (2021). The impact of COVID-19 on learning: Investigating EFL learners' engagement in online courses in Saudi Arabia. *Education Sciences*, *11*(3), 99. https://doi.org/10.3390/educsci11030099

Pekrun, R., & Linnenbrink-Garcia, L. (2012). Academic emotions and student engagement. In S. L. Christenson, A. L. Reschly, & C. Wylie (Eds.), *Handbook of research on student engagement* (pp. 259-282). Springer.

Pittaway, S., & Moss, T. (2014). Initially, we were just names on a computer screen: Designing engagement in online teacher education. *Australian Journal of Teacher Education, 39*(7), 37–45. https://doi.org/10.14221/ajte.2014v39n7.10

Prince, M., Felder, R., & Brent, R. (2020). Active student engagement in online STEM classes: Approaches and recommendations. *Advances in Engineering Education, 8*(4), 25. https://advances.asee.org/wp-content/uploads/Covid%2019%20Issue/Text/2%20AEE-COVID-19-Felder.pdf

Pugh, C. (2019). Self-determination: Motivation profiles of bachelor's degree-seeking students at an online, for-profit university. *Online Learning, 23*(1), 111-131. https://doi.org/10.24059/olj.v23i1.1422

Rajabalee, B. Y., Santally, M. I., & Rennie, F. (2020). A study of the relationship between students' engagement and their academic performances in an eLearning environment. *E-Learning and Digital Media, 17*(1), 1–20. https://doi.org/10.1177/2042753019882567

Ray, A. E., Greene, K., Pristavec, T., Hecht, M. L., Miller-Day, M. A., & Banerjee, S. C. (2021). Exploring indicators of engagement in online learning as applied to adolescent health prevention: A pilot study of REAL media. *Educational Technology Research and Development, 68*(6), 3143-3163. https://doi.org/10.1007/s11423-020-09813-1

Redmond, P., Heffernan, A., Abawi, L., Brown, A., & Henderson, R. (2018). An online engagement framework for higher education. *Online Learning, 22*(1), 183-204. https://doi.org/10.24059/olj.v22i1.1175

Read, D. L. (2020). *Adrift in a pandemic: Survey of 3,089 students finds uncertainty about returning to college*. Top Hat.

Reeve, J., Jang, H., Carrell, D., Jeon, S., & Barch, J. (2004). Enhancing students' engagement by increasing teachers' autonomy support. *Motivation and Emotion, 28*(2), 147 – 169. https://doi.org/10.1023/B:MOEM.0000032312.95499.6f

Reschly, A. L., & Christenson, S. L. (2012). Jingle, jangle, and conceptual haziness: Evolution and future directions of the engagement construct. In S. L. Christenson, A. L. Reschly, & C. Wylie (Eds.), *Handbook of research on student engagement* (pp. 3-19). Springer.

Russell, V. J., Ainley, M., & Frydenberg, E. (2005). Student motivation and engagement. *Schooling Issues Digest 2005/2*. Australian Government: Department of Education, Science and Training.

Scharrer, E., & Ramasubramanian, S. (2021). *Quantitative research methods in communication: The power of numbers for social justice*. Taylor & Francis.

Schell, J., Lukoff, B. and Mazur, E. (2013), Catalyzing learner engagement using cutting-edge classroom response systems in higher education. In C. Wankel & P. Blessinger (Ed.), *Increasing student engagement and retention using classroom technologies: Classroom response systems and mediated discourse technologies* (*Cutting-edge technologies in higher education, Vol. 6 Part E*) (pp. 233-261). Emerald Group Publishing Limited. https://doi.org/10.1108/S2044-9968(2013)000006E011

Sinclair, M. F., Christenson, S. L., Lehr, C. A., & Anderson, A. R. (2003). Facilitating student engagement: Lessons learned from Check & Connect longitudinal studies. *The California School Psychologist, 8*(1), 29-41. http://dx.doi.org/10.1007/BF03340894

Singh, S., & Saqar, R. (2021). A critical look at online survey or questionnaire-based research during COVID-19. *Asian Journal of Psychiatry, 65*, 102850. https://doi.org/10.1016/j.ajp.2021.102850

Skinner, E., Furrer, C., Marchand, G., & Kindermann, T. (2008). Engagement and disaffection in the classroom: Part of a larger motivational dynamic? *Journal of Educational Psychology, 100*(4), 765–781. https://doi.org/10.1037/a0012840

Skinner, E. A., Kindermann, T. A., & Furrer, C. J. (2009). A motivational perspective on engagement and disaffection: Conceptualization and assessment of children's behavioral and emotional participation in academic activities in the classroom. *Educational and Psychological Measurement, 69*(3), 493-525. http://dx.doi.org/10.1177/0013164408323233

Skinner, E. A., & Pitzer, J. R. (2012). Developmental dynamics of student engagement, coping, and everyday resilience. In S. L. Christenson, A. L. Reschly, & C. Wylie (Eds.), *Handbook of research on student engagement* (pp. 21-44). Springer.

Symonds, J. E., Kaplan, A., Upadyaya, K., Salmela-Aro, K., Torsney, B. M., Skinner, E., & Eccles, J. S. (2019). Momentary engagement as a complex dynamic system. *PsyArXiv Preprints*. https://doi.org/10.31234/osf.io/fuy7p

The United Arab Emirates Government Portal . (2022, March 27). *Distance learning in times of COVID-19*. https://u.ae/en/information-and-services/education/distance-learning-in-times-of-covid-19

Upadhayaya, P. R., Sharma, B., Gnawali, Y.P., & Belbase, S. (2021). Factors influencing graduate stduents' perceptions of online and distance learning in Nepal. *Turkish Online Journal of Distance Education, 22*(3), 236-269. https://doi.org/10.17718/tojde.961844

Wang, Q. (2008). A generic model for guiding the integrations of ICT into teaching and learning. *Innovations in Educational and Teaching International, 45*(4), 411–19. https://doi.org/10.1080/14703290802377307

Wang, Z., Bergin, C., & Bergin, D. A. (2014). Measuring engagement in fourth to twelfth grade classrooms: The classroom engagement inventory. *School Psychology Quarterly, 29*(4), 517-535. http://dx.doi.org/10.1037/spq0000050

Wang, S., & Zhang, D. (2020). Perceived teacher feedback and academic performance: the mediating effect of learning engagement and moderating effect of assessment characteristics. *Assessment & Evaluation in Higher Education*, *45*(7), 973-987. https://doi.org/10.1080/02602938.2020.1718599

Wigfeld, A., Eccles, J. S., Fredricks, J., Simpkins, S., Roeser, R., & Schiefele, U. (2015). Development of achievement motivation and engagement. In R. M. Lerner, C. Garcia, & M. Lamb (Eds.), *Handbook of child psychology and developmental science: Vol. 3. Social and emotional development* (7th ed., Vol. 3, pp. 657–700). Wiley.

Yan, L., Whitelock-Wainwright, A., Guan, Q., Wen, G., Gašević, D., & Chen, G. (2021). Students' experience of online learning during the COVID-19 pandemic: A province-wide survey study. *British Journal of Educational Technology, 52(5)*, 2038-2057. https://doi.org/10.1111/bjet.13102

Zhang, A., & Yang, Y. (2021). Toward the association between EFL/ESL teachers' work engagement and their students' academic engagement. *Frontiers in Psychology*, *12,* 739827. https://doi.org/10.3389/fpsyg.2021.739827

Appendix A
Survey Instrument

Learner engagement has been recognized as a valuable element in the success of the learning process and enhanced performance among learners of various levels and interests. The current survey is designed to collect data about the factors that influence learner engagement among college learners during their study in the online environment. The UAE University's Research Ethics Committee has approved the study. (Ref# ERS_2022_8472).

By submitting your responses, you will be helping the researchers to gain better insight into the factors that influence learner engagement in the online environment and suggest strategies to increase the levels of learner engagement among college learners. Participation is completely voluntary. The survey will take approximately 10 minutes and is conducted fully online. The information obtained from this survey is confidential and will be recorded anonymously.

Your participation is highly appreciated.

Do you agree to take part in this online survey sent to you by Ph.D. students in the College of Education at the UAE University?

□ Yes, I agree to take part in this survey.
□ No, I do not agree to take part in this survey.

Section 1
Demographics

Your Gender Male: _____ Female: _____

Your Age: 18 - 22: ____ 23 – 29:_____ 30 – 35: _____ Above 35: _____

Year of Study: First Year: _____ Second Year: _____ Third Year:_____ Fourth Year:____

Section 2
Instructions
Please indicate to what extent you agree/disagree with the following statements based on your experience in online university courses.

Strongly Disagree	Disagree	Agree	Strongly Agree

1. I often pay full attention to the courses which I consider important for my future career.
2. I feel engaged in online classes when I have positive relationships with my colleagues.
3. The use of advanced technology positively influences my participation during online classes.
4. The use of advanced technology negatively influences my participation during online classes.
5. Collaboration with my classmates in group work is less effective in the online environment than in the face-to-face environment.
6. I often participate in classes that have opportunities for real-life learning.
7. I often feel engaged in the classes where I am given the chance of independent learning.
8. I often feel less encouraged to participate in online classes than in traditional classes.
9. I often participate in online courses where the instructor gives the students the opportunity to participate in decision-making.

10. I often feel frustrated during online discussions.
11. Online classes do not provide the students with opportunities to participate in meaningful learning experiences.
12. I often contribute to the class activities when the online course matches my expectations.
13. I often hesitate to share learning materials with other classmates during online classes.
14. My learning engagement is influenced by the availability of online resources related to my courses.
15. My previous learning experience does not influence my engagement in my current classes.
16. I find the online courses intellectually exhausting.
17. The instructor often provides me with effective feedback.

Section 3
Instructions
Based on your experience during the online classes, please select the statement which is most accurate in your experience.

18. My participation in the online classroom mostly depends on
   a. My relationship with the instructor of the course.
   b. My relationship with my colleagues in the course.
   c. My self-confidence during the online course.
   d. My interest in the course.
19. The instructor's feedback in the online course often
   a. Encourages me to exert more effort in the course.
   b. Discourages me from participating in the course.
   c. Raises the level of my tension in the course.
   d. Improves my learning experience in the course.
20. Online classes are often motivating when
   a. Students are encouraged to express their opinions freely.
   b. Students share their knowledge and experience.
   c. Students are encouraged to be independent learners.
   d. Students work well collaboratively in groups.
21. My participation in online classes is mostly improved by using
   a. Breakout rooms
   b. Blackboard whiteboard
   c. Interactive online platforms
   d. Group discussions
22. Online collaborative work mostly helps me to
   a. Improve my social skills.
   b. Explore different areas of interest.
   c. Enhance my interaction with my colleagues.
   d. Improve my participation in the classroom.
23. From the online activities used during classes, I mostly prefer
   a. Online videos
   b. Interactive games
   c. Online discussions
   d. Individual work
24. I mostly feel demotivated in the online classroom during
   a. Group collaboration
   b. Online discussions
   c. Individual assignments
   d. Pair class activities