The factors affecting student satisfaction with online education during the COVID-19 pandemic: an empirical study of an emerging Muslim country

Received 29 September 2020
Revised 30 September 2020
Accepted 30 September 2020

Mohamed A.K. Basuony, Rehab EmadEldeen and Marwa Farghaly
Department of Accounting, School of Business, The American University in Cairo, Cairo, Egypt, and

Noha El-Bassiouny and Ehab K.A. Mohamed
Faculty of Management Technology, German University in Cairo, Cairo, Egypt

Abstract

Purpose – This study aims to investigate factors affecting students' satisfaction with online learning during the COVID-19 pandemic.

Design/methodology/approach – This study uses quantitative data. A survey of 280 respondents, representing undergraduate students in business schools in Cairo, Egypt is conducted. The survey includes both public and private universities. The participants are questioned about their opinions and attitudes toward satisfaction with online learning amidst the COVID-19 pandemic.

Findings – The findings of this study reveal that Egyptian university students prefer to use synchronous teaching methods using different platforms. Attending virtual sessions and real-time conference call classes are the most preferred mode of delivery as perceived by the respondents. Also, the results of this study found that the internet, platform, class time, loss of interest, motivation and self-motivation and use of online exams as an assessment can be considered as the factors that significantly affect students' satisfaction with online learning in Egypt.

Originality/value – To the best of the knowledge, this study is among the first group of studies in Muslim emerging countries that explore the factors affecting students' satisfaction with online learning during the COVID-19 pandemic.

Keywords Student satisfaction, Online learning, COVID-19, Emerging Muslim country

Paper type Research paper

1. Introduction

With the closure of educational institutions worldwide, universities have the responsibility to continue delivering education as the lockdown and restrictions may be extended for a longer period. Educational institutions tried to keep the essential operations going, while establishing more effective and strategic decision-making systems for the future to respond to major, fast-moving and disruptive crises. With few exceptions, nearly all reporting institutions transitioned to emergency teaching and learning approaches (Johnson *et al.*, 2020). This situation simulated the quick transition to online modalities as video conferencing, polls, Zoom meetings and Google classroom. Institutions are becoming more interested in synchronous and asynchronous teaching methods with the aim of delivering high-quality course content to their students (Mukhtar *et al.*, 2020).

Journal of Islamic Marketing

1759-0833
DOI 10.1108/JIMA-09-2020-0301

But not all faculties conducted a remote learning model as many of these methods were implemented for the first time in some universities. Most of the business schools decided to rely on online teaching, as they implemented a model enabling a rapid transition from the traditional to the distance learning model in a state of emergency. It emphasized technical, organizational and pedagogical changes to enable different interaction methods, ensure continuity and provide high-quality education (Goda *et al.*, 2020). Other business schools decided to rely on students' self-learning abilities. Although some faculty members for some of the business courses like accounting resisted the idea that accounting could ever be taught effectively outside a live classroom setting, to comply with quarantine and social distancing guidelines, traditional courses abruptly and unexpectedly transitioned to online offerings mid-semester (Niemotko and Tolan, 2020).

Prior literature investigating shifts to online course delivery during crises has offered lessons learned during these times. Efforts were made by many universities during the COVID-19 pandemic, some studies showed how complicated coping with COVID-19 was for these universities (Goda *et al.*, 2020; Johnson *et al.*, 2020; Mukhtar *et al.*, 2020).

Ultimately, the main objective of universities is to deliver a valuable output for the student and to improve student satisfaction. The five pillars of quality in online education are student satisfaction, faculty satisfaction, access, learning effectiveness and cost-effectiveness (Wang, 2006). Therefore, student satisfaction is a vital issue and it must be considered in the assessment of the course effectiveness as it will lead to higher levels of participation, motivation, learning and success (Sahin and Shelley, 2008; Wickersham and McGee, 2008; Mohamed, 2009). Some studies showed that online learning has a negative impact on student learning (Cao *et al.*, 2020; Duraku and Hoxha, 2020; Onyema *et al.*, 2020). Other studies showed that online learning has a positive impact on student learning (Bojovic *et al.*, 2020; Moreno-Guerrero *et al.*, 2020).

To the best of our knowledge, this study is considered the first study in the Muslim emerging countries that explored the determinants of students' satisfaction with online learning during the COVID-19 pandemic.

The structure of this study can be organized into the following sections. Section 2 covers the literature review and hypotheses development. Section 3 describes the research methodology used. Section 4 is analyzing the data. Finally, Section 5 covers the conclusions of this study.

2. Literature review and hypotheses development

2.1 Internet facilities and platform

For new education methods to succeed, teachers need to focus on designing new learning activities and helping students acquire specific knowledge by adopting and integrating distance learning tools and technologies using the best way to encourage and motivate students to be more actively involved in the teaching process and more engaged in the knowledge acquisition process. For this strategy, teachers must possess specific pedagogical knowledge and skills and be ready to change their teaching process concerning the change of learning methodology. Students possess sufficient technical knowledge and equipment to attend online lessons. Some parents stated that their children had more than one technological device that they could use to participate in online learning (Duraku and Hoxha, 2020).

A research team at the University of Scotland conducted a survey, which found that internet access has a significant effect on student performance (Hassan *et al.*, 2020). The e-learning platforms were not only challenging to the majority of the students because of the limited access to the internet and lack of the technical knowhow of these technological

devices (Duraku and Hoxha, 2020) but also working with distance learning platforms was more challenging for teachers (Bojovic *et al.*, 2020). On the other hand, other studies found the achievement domain, compared to the technology domain, yielded higher scores for control (Butz *et al.*, 2016). We, therefore, hypothesize:

H1. There is a positive significant relationship between internet facilities and student satisfaction with online learning during the pandemic.

H2. There is a negative significant relationship between the platform used and student satisfaction with online learning during the pandemic.

2.2 Course structure

The course structure is seen as an essential variable that affects the success of online learning. It is "the degree to which an education program can accommodate the needs of each learner" (Moore, 1991).

Some studies reveal that there is a statistical significance for course content and design on learning; course content on satisfaction; and course content on the perceived quality of outcome (Eom and Ashill, 2016; Sebastianelli *et al.*, 2015). Other studies find that the students are mastering the content in online learning but the students in online courses are not mastering the skills at the same level. It is claimed that a strong social presence and building an online community could help facilitate learning in online courses (Callister and Love, 2016). We, therefore, hypothesize that:

H3. There is a positive significant relationship between course structure and student satisfaction with online learning during the pandemic.

H4. There is a positive significant relationship between workload and student satisfaction with online learning during the pandemic.

2.3 Participation and class time

Interaction and participation have become an emerging issue and is still evolving in the online learning environment. Many students, if given the choice, may prefer to attend a virtual session without being seen or heard, claiming that they are looking "too comfortable" to be seen by their classmates and instructor. On the other hand, faculty may require that students to be seen, as some professors feel the need to observe students and their reactions in real-time to have a meaningful class. Other faculty may be comfortable lecturing without this immediate feedback. The challenge is being able to reconcile the different expectations held by faculty and students regarding interaction in an online setting (Niemotko and Tolan, 2020).

Furthermore, it is important to emphasize that distance learning should be student-centric, and to know the characteristics of students to identify potential barriers to learning such as motivation, costs, learning feedback, communication with teachers, student support and services, sense of isolation.

In the same vein, some studies reveal the significance of online professor-student interaction on satisfaction and student-student interaction and mentoring support on the perceived quality of learning outcome, as well as student satisfaction (Eom and Ashill, 2016; Sebastianelli *et al.*, 2015; ´Topal, 2016). Other studies find that student performance and interaction are stronger in face-to-face settings (Sohn and Romal, 2015). We, therefore, hypothesize that:

H5. There is a positive significant relationship between participation and student satisfaction with online learning during the pandemic.

H6. There is a positive significant relationship between class time and student satisfaction with online learning during the pandemic.

2.4 Motivation and self-motivation

Motivating the student start by themselves. They should have self-motivation. Self-motivation is defined as the self-generated energy that gives behavior direction toward a particular goal (Beishuizen *et al.*, 1994).

Prior literature shows that intrinsic student motivation and self-motivation have no significant relationship with student satisfaction and learning outcomes; intrinsic student motivation affects learning outcomes but not students' satisfaction. The findings also suggest that course design, instructor and dialogue are the strongest predictors of students' satisfaction and learning outcomes (Eom and Ashill, 2016).

Other studies suggest that students with strong motivation were more successful and tend to learn the most in web-based courses than those with less motivation (Frankola, 2001; LaRose and Whitten, 2000). Students' motivation is a major factor that affects the attrition and completion rates in web-based courses and a lack of motivation is also linked to high drop-out rates (Frankola, 2001; Galusha, 1997).

In the classroom, instructors have used pedagogical approaches that encouraged the active participation and motivation of students. On the contrary, elements from interacting with students and motivating them in different courses are missing in online learning (Duraku and Hoxha, 2020). Furthermore, instructor feedback intends to improve and motivate student performance via informing students how well they are doing and by directing students' learning efforts. Instructors' feedback in the web-based system includes the simplest cognitive feedback (e.g. examination/assignment with his/her answer marked wrong), diagnostic feedback (e.g. examination/assignment with instructor comments about why the answers are correct or incorrect) and prescriptive feedback (instructor feedback suggesting how the correct responses can be constructed) via replies to student e-mails, graded work with comments, online grade books and synchronous and asynchronous commentary. Studies reveal that online education can be a superior mode of instruction if it is targeted to learners with specific learning styles (visual and read/write learning styles) and with timely, meaningful instructor feedback of various types (Eom and Ashill, 2016). Instructor feedback to students can improve learner affective responses, increase cognitive skills and knowledge and consequently enhance student satisfaction (Eom and Ashill, 2016). We, therefore, hypothesize that:

H7. There is a negative significant relationship between self-motivation and student satisfaction with online learning during the pandemic.

H8. There is a positive significant relationship between motivation and student satisfaction with online learning during the pandemic.

2.5 Stress and loss of interest

No doubts, unplanned school closures can cause severe problems for students, educators, parents and society at large. It could negatively affect the academic interest and

performance of students. If the students are not engaged productively, it could lead to idleness which might result in youth involvement in crimes, loss of interest in learning and poor academic performance.

Moreover, students have been observed to have behavioral changes, to be frightened and to show signs of panic, despair, stress, fear, anxiety, confusion and passivity during the isolation period. Various changes and levels of anxiety have also been observed within the family, including increased burden and worry levels, increased fear, pressure, changes in sleep rhythms and the impossibility of their personal space.

Butz *et al.* (2016) found that perceived success was positively related to enjoyment and negatively related to anxiety and boredom.

Some studies find that COVID-19 anxiety, financial circumstances change and finding a quiet place to work within the house during lockdown had great effects on student performance (Hassan *et al.*, 2020) and negatively affected student success (Butz *et al.*, 2016). We, therefore, hypothesize that:

H9. There is a negative significant relationship between stress and student satisfaction with online learning during the pandemic.

H10. There is a negative significant relationship between loss of interest and student satisfaction with online learning during the pandemic.

2.6 Methods of assessment

Regarding the examination methods, different alternates that are being used by instructors were presented. According to the instructors' statements, the most frequent assessment of student performance is done through homework or quizzes evaluation. To further reduce the probability of collusion, the questions in the quiz were also shuffled. Also, some business schools changed their method of assessment to be implemented pass/fail exams, online exams and research projects, while others postponed their final exams. In Egypt, business schools started delivering their lectures online and changed the assessment criteria to depend mainly on research and online exams.

To support faculty design the method of the online assessments, guidelines available on the internet were collected and nine themes were specified. The guidelines comprised: Assess the requirements for applying online assessment; ensure alignment of the method of assessment with the learning objectives; report the diversity of students' conditions; preserve a good balance of formative and summative assessments; inspire student learning with online assessment; take into consideration the format; arrangement and timing of tests; create clear communication to students regarding assessment problems; make sure of the high-quality feedback; and report assessment validity intimidations (Rahim, 2020).

Some universities changed the format of the final exam to be multiple choice questions, other universities conducted the online exam to be as similar as possible to the traditional final exam, the students had to be administered the online exam at the same time. All students have one attempt for the exam at the same time, and this timeline must be announced at least 2 or 3 weeks in advance, shuffle the questions, they must have no opportunity to return to previously attempted questions, fair time budget in light of online delivery, a backup exam should also be ready in the occasion students could not make it to the first one because of unexpected conditions (George, 2020).

Case studies have also shown an increased burden on students and they are coping with the sudden situation, where they are expected to do their best in lessons, while everything around them has changed.

Some studies find that the online assessment has a positive effect on student satisfaction (George, 2020), another study found that there is no difference between student satisfaction in both the traditional exam and the online exam (Topal, 2016). Stowell and Bennett (2010) find that students who normally experience extraordinary test anxiety in the classroom had low test anxiety when taking online exams, however, the reverse was true for those who have low test anxiety in the classroom. Barkley (2002) recommends that universities should have a variety of assessment tools to reach a group of diverse students. We, therefore, hypothesize that:

H11. There is a positive significant relationship between the examination method and student satisfaction with online learning during the pandemic.

3. Methodology

3.1 Population frame and sample

The participants of this study are the undergraduate students in the business schools in the universities allocated in Cairo city, Egypt. The sample of this study included both three public universities (Cairo University, Ain Shams University and Helwan University) and the top 10 private universities.

3.2 Data collection

There are many methods of measurement that can be used to collect the data. The questionnaire was selected as a suitable measure for this study. The questionnaire was designed to be answered on GoogleDoc and was sent to the respondents via emails. The data was collected between the period of July 24, 2020 and the end of September 20, 2020. The total of 280 respondents were received from 140 female students and 140 male students. Of the total, 239 students (85.4%) from private institutions and 41 students (14.6%) from public institutions. Table 1 shows the sociodemographic data that includes the students' status, online course time, learning style and the course's final assessment.

3.3 Questionnaire design

Based on prior literature (see e.g. Eom and Ashill, 2016; Butz *et al.*, 2016; Hassan *et al.*, 2020; George, 2020; Rahim, 2020), We opted for the self-report type approach. The participants can answer the questions that express their opinions and attitudes of their satisfaction with online education in the pandemic of COVID-19. The questions are designed to be closed in type with a pre determined scale of measurement using interval measurement of Likert scale. The questionnaire has been divided into two parts. The first one is dealing with sociodemographic data as shown in Table 1. The second part is related to the determinants of students' satisfaction with online education.

3.4 Measurement of variables

The questionnaire was used to collect the data on the determinants of students' satisfaction with online learning. The 53 items on the scale have been grouped into 12 variables: satisfaction (A_1 _ A_5); internet ($B_1 - B_3$); platform ($C_1 - C_2$); course structure ($D_1 - D_8$); stress ($E_1 - E_7$); workload ($F_1 - F_2$); class time ($G_1 - G_2$); loss of interest ($H_1 - H_4$); motivation ($I_1 - I_9$); self-motivation ($J_1 - J_3$); participation ($K_1 - K_6$) and exam and research ($L_1 - L_2$). The five-level Likert scale was used ranging from (1 = strongly disagree; 5 = strongly agree). Kaiser-Meyer-Olkin measure of sampling adequacy is acceptable with (KMO = 0.883). Bartlett's test of sphericity is significant at the 1% level where $Chi^2 = 1{,}709.442$.

Item	*n*	(%)
Gender		
Female	140	50
Male	140	50
Type of institution		
Private	239	85.4
Public	41	14.6
Students status		
Freshman (1st year)	101	36.1
Sophomore (2nd year)	108	38.6
Junior (3rd year)	22	7.8
Senior (4th year)	49	17.5
Online courses time		
3–6 h a week	118	42.1
6–9 h a week	90	32.1
9–12 h a week	28	10
More than 12 h a week	44	15.7
Learning style		
Visual learner	62	22.1
Aural learner	40	14.3
Read/write learner	105	37.5
Kinesthetic learner	73	26.1
Course final assessment		
Online exam	134	47.9
Research	31	11.1
Both	115	41.1

Table 1.
Sociodemographic data

3.5 Reliability and validity test

This study used Cronbach's alpha as an attesting of reliability. This Cronbach's alpha was used as a measure of internal consistency. Field (2015) stated that the acceptable level of reliability is Cronbach's alpha to be around 0.70 where most of the alpha coefficient between 0.70 and 0.90 is shown in Table 2. With the aim of implementation, the validity test, each scale item was correlated with the scale itself (Piercy, 1989). Table 2 provides the item-total correlations which specify that all coefficients were significantly at the 1% level.

4. Findings and analysis

Diverse analytical techniques are used to explore the determinants of students' satisfaction with online learning during COVID-19. These techniques include descriptive statistics, *t*-independent sample tests and OLS regression.

4.1 Descriptive statistics

Table 3 displays the descriptive statistics for satisfaction as a dependent variable and the other 11 independent variables. The descriptive analysis includes the minimum, maximum, mean as a measure of the central of tendency and finally the standard deviation as a measure of dispersion.

Figure 1 showed that there is no uniformity regarding the format for online learning or the platforms used. Colleges and universities offered synchronous learning (i.e. to every

Scale	No. of scale items	Cronbach's α	Item-total correlation* (1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Satisfaction	5	0.90	0.759	0.872	0.857	0.888	0.844				
Internet	3	0.80	0.859	0.871	0.815						
Platform	2	0.64	0.864	850							
Course structure	8	0.93	0.817	0.799	0.813	0.801	0.811	0.841	0.850	0.845	
Stress	7	0.88	0.767	0.748	0.696	0.772	0.797	0.829	0.743		
Workload	2	0.77	0.904	0.898							
Class time	2	0.61	0.854	0.839							
Loss of interest	4	0.89	0.842	0.874	0.914	0.817					
Motivation	9	0.89	0.674	0.485	0.776	0.810	0.773	0.771	0.747	0.741	0.735
Self-motivation	3	0.70	0.804	0.829	0.742						
Participation	6	0.78	0.606	0.675	0.770	0.734	0.736	0.612			
Exam and research	2	0.90	0.953	0.953							

Table 2. Multi-item scale reliability and validity statistics

Notes: *Pearson correlation coefficients; all correlations are significant at the 0.01 level

Scale	Minimum	Maximum	Mean	SD
Satisfaction	1.00	5.00	3.0536	1.25894
Internet	1.00	5.00	3.8750	1.05175
Platform	1.00	5.00	4.1893	0.94843
Structure	1.00	5.00	3.8679	1.04746
Stress	1.00	5.00	3.6500	1.02949
Workload	1.00	5.00	3.5607	1.18981
Time	1.00	5.00	3.3107	1.30063
Interest	1.00	5.00	3.1929	1.27786
Motivation	1.00	5.00	3.5107	0.96529
Self-motivation	1.00	5.00	4.0750	0.98996
Participation	1.00	5.00	3.6464	0.89201
Exam	1.00	5.00	3.3571	1.29278

Table 3. Descriptive statistics

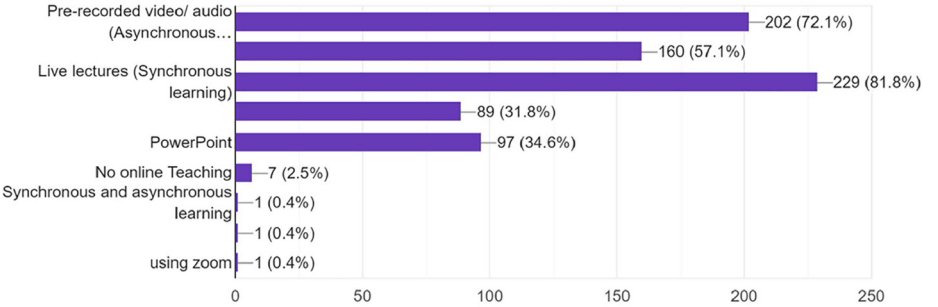

Figure 1. The methods of teaching used in the online courses

student in the class at once), asynchronous offerings or blended versions of both. The crisis has highlighted the lack of agreement that existed regarding best practices in this new area. Most institutions provided technology for the professors and the students to meet for virtual classes in real-time and online meetings using Zoom or other teleconferencing software.

Faculty members, as online meeting facilitators, can be heard and seen, while students, as participants, can also be seen and heard or can opt solely to listen and comment through a written chat on the virtual classroom screen. The results highlighted that the synchronous teaching methods live lectures were used by the majority of the professors around 81.8% offered live lectures or virtual classrooms using different teleconferencing software. In addition, 72.1% of the students stated that they receive prerecorded lectures (videos-audio) only without direct interaction with the students and immediate feedback. Some of the professors claimed that they feel more comfortable. On the other hand, many students stated that they preferred to attend a virtual session without being seen or heard claiming that they are looking "too comfortable" to be seen by their classmates and instructor. Some institutions 34.6% used PowerPoint with pre-recorded audio while 2.5% of the universities and institutions did not offer any online learning to its students.

Figure 2 displays the technological aspects during the pandemic where 91% of the students have regular access to the internet at home and only 2.9% of the students do not have computers or internet connections available. In total, 13.9% of the students believe that their access to computers and the internet was affected due to the pandemic and some technical problems that may occur in the platforms and modules they use.

Figure 3 shows the benefits of the student experience with online learning during the pandemic. Many students 70% believed that online learning saved a lot of time and offered the flexibility of the class time. As a result of texting and streaming video, students are accustomed to having the ability to "rewind and replay" if something is missed. Pre-recorded lectures and audio PowerPoints give students this option to rewind and replay, and thus may provide a more advantageous learning experience for many students. Moreover, 12.9% of the students claimed that they got better explanation instructions and 18.9% of the students asserted that they got improved learning experience. However, only a few students with a percentage of 8.9% stated that there were more interaction and collaboration with their classmates.

Figure 4 demonstrates the disadvantages of taking online courses during the pandemic. The students emphasized three drawbacks: instructions is not as good as face to face courses, low/weak interaction with their classmates and the internet problems which may drop or lag when attending a zoom lecture or submitting any course work. The students were also asked to specify other drawbacks rather than the ones included in the survey. The students added some emotional aspects that they miss their universities and the face to face interactions with their professors. They also noted that the examination methods used were not satisfactory.

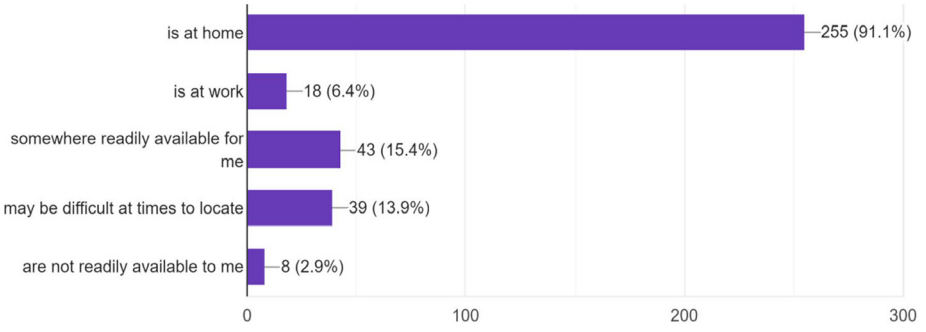

Figure 2.
Availability of the internet connection and computer

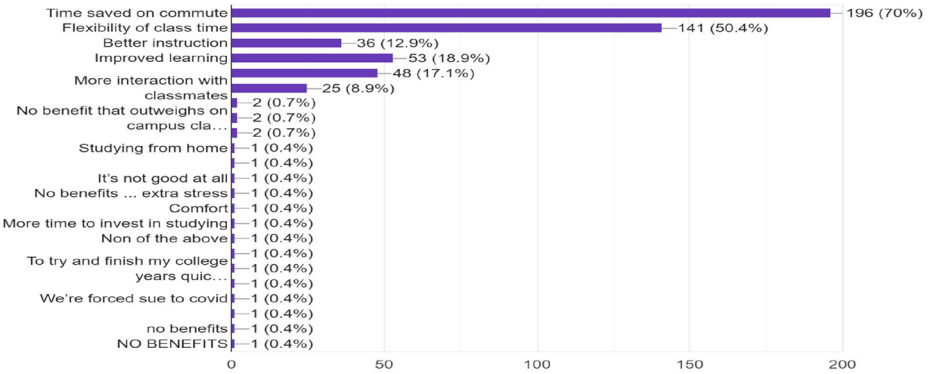

Figure 3.
Benefits of taking online courses

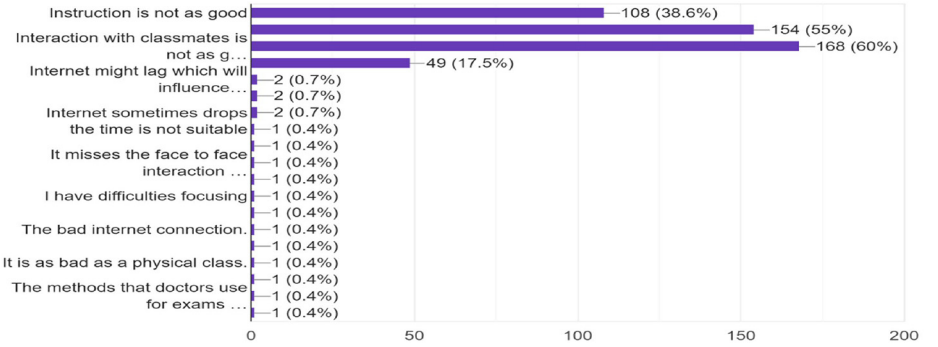

Figure 4.
The drawbacks of taking online courses

Table 4 Panel (A) showed that the highest percentage of the female are read and write learners 50.7% as they are a note taker and draw things to remember them and they do well with hands-on projects or tasks. However, the highest percentage of the male are kinesthetic learners 29.3%, as you learn best by doing and prefer hands-on experiences and they are often high energy and like to make use of touching, moving and interacting with their

	Visual learner		Kinesthetic learner		Read/write learner		Aural learner		Total	
	n	**%**	***n***	**%**	***n***	**%**	***n***	**%**	***n***	**%**
Panel (A): student learning style and gender										
Female	26	18.6	32	22.9	71	50.7	11	7.9	140	100
Male	36	25.7	41	29.3	34	24.3	29	20.7	140	100
Total	62	22.1	73	26	105	73.5	40	14.2	280	100
Panel (B): student learning style and studying the online courses time										
3–6 h a week	36	58.1	16	21.9	51	48.6	15	37.5	118	21.1
6–9 h a week	15	24.2	26	35.6	31	29.5	18	45.0	90	16.1
9–12 h a week	3	4.8	11	15.1	10	9.5	4	10.0	28	5.0
More than 12 h	8	12.9	20	27.4	13	12.4	3	7.5	44	7.9
Total	62	100	73	100	105	100	40	100	2	100

Table 4.
Student learning style

environment. On the other hand, the lowest percentage of women and men are aural learners as they learn by listening aural and enjoy aural discussions and they are easily distracted by noise. Panel (B) showed that most of the read/write and visual learners took from 3 to 6 h per week to study the online courses 48.6% and 58.1%, respectively. However, the majority of kinesthetic and aural learners took from 6 to 9 h per week to study the online courses 35.6% and 45.0%, respectively.

Table 5, Panel (A) showed that the majority of the private and public universities in Egypt took an online exam 49.4% and 39.0%, respectively, and the percentage came after that is that both the private and public universities took both an online and research as a final exam assessment in their courses 42.3% and 34.1%, respectively. Furthermore, Panel (B) showed that the plurality of the freshman, sophomore and junior students took an online exam 54.5%, 50.0% and 54.5%, respectively. However, most of the senior students (53.1%) took both online and research as a final exam assessment.

4.2 Univariate analysis

Table 6 shows the differences between students' satisfaction and the gender of the participants (Female and male) as presented in Panel (A) below. We found that there is a significant difference between the satisfaction of online learning for female and male students. Also, Panel (B) describes the differences between students' satisfaction and the type of institutions. We found that there is no significant difference between the students' satisfaction with online learning for both private and public institutions.

	Both		Online exam		Research		Total	
	n	(%)	*n*	(%)	*n*	(%)	*n*	(%)
Panel (A): final assessment in the courses and university								
Private	101	42.3	118	49.4	20	8.4	239	100
Public	14	34.1	16	39.0	11	26.8	41	100
total	115	20.5	134	23.9	31	5.5	280	100
Panel (B): final assessment in the courses and student level								
Freshman (1st year)	38	37.6	55	54.5	8	7.9	101	100
Sophomore (2nd year)	46	42.6	54	50.0	8	7.4	108	100
Junior (3rd year)	5	22.7	12	54.5	5	22.7	22	100
Senior (4th year)	26	53.1	13	26.5	10	20.4	49	100
Total	115	20.5	134	23.9	31	5.5	280	100

Table 5. Final assessment

Item	Mean	S.D	S.E	*t*-value	Sig.
Panel (A): students' satisfaction and gender					
Female	2.70	1.17	0.098	−4.889	0.000
Male	3.41	1.25	0.106	−4.889	0.000
Panel (B): students' satisfaction and institution type					
Private	3.03	1.24	0.080	−0.779	0.437
Public	3.20	1.36	0.213	−0.728	0.470

Table 6. Paired sample *t*-test

4.3 Multivariate analysis

This section deals with testing the hypotheses by using OLS as a measure of multivariate analysis. Table 7 explains the relationship between the students' satisfaction with online learning as a dependent variable and the other 11 independent variables.

The results in Table 7 show that the structural model explains 49% of the variance in the students' satisfaction. It shows that the internet has a significant and positive effect on student satisfaction (at 0.01 level), so internet access, connection and speed improve student satisfaction. The result is consistent with (Hassan *et al.*, 2020). Additionally, the platform has a significant and negative effect on the student satisfaction (at 0.01 level), which means that the students are not satisfied with the universities platform may because of the highly complicated system and lack of the technical knowhow of these platforms or may the system is disturbed via unexpected users pressure. The result is consistent with Bojovic *et al.* (2020), Duraku and Hoxha (2020). Class time has a significant and positive effect on student satisfaction (at 0.01 level), so the students are satisfied with the length of the online class time and they feel that the time passes quickly. Furthermore, the loss of interest has a significant and negative effect on student satisfaction (at 0.01 level), which means that the students are satisfied and have a high interest in the way and methods of teaching the online courses.

Moreover, the motivation has a significant and positive effect on the students' satisfaction with a coefficient of 0.332 (at 0.01 level) which means that if the motivation of the students increased by 1%, it will lead to an increase in student satisfaction by 33.2%. Consequently, the recording videos, instructor teaching and feedback motivate the students and improve their satisfaction. The result is consistent with Frankola (2001), LaRose and Whitten (2000). On the flip side, the result shows that the self-motivation has a negative effect on the students' satisfaction (at 0.1 level). Ultimately, the online assessment has a significant and positive effect on the students' satisfaction (at 0.01 level), so, the students are satisfied with having an online final exam assessment. The result is consistent with George (2020). Table 8 summarizes the hypotheses testing.

Table 7.
Regression analysis

Variable	Student satisfaction		Collinearity statistics
	Coefficient	*t*	VIF
Intercept	0.425	1.295	
Internet	0.183***	2.708	1.747
Platform	−0.197***	−2.539	1.876
structure	0.087	0.991	2.912
Stress	0.083	0.888	3.220
Workload	0.055	1.044	1.343
Class time	0.139***	2.461	1.874
Loss of interest	−0.128***	−2.609	1.351
Motivation	0.332***	3.421	3.036
Self-motivation	−0.125*	−1.718	1.782
participation	0.131	1.243	3.065
exam	0.215***	3.557	2.110
Adjusted R^2	0.49		
F-statistics	25.48		
Prob (*F*-statistics)	0.000		

Note: *, **, *** represent significance at 0.1, 0.05 and 0.01 levels, respectively

5. Conclusions

It is concluded that Egyptian universities prefer to use synchronous teaching methods using different platforms. Attending virtual sessions and real-time conference call classes are the most preferred mode of delivery as perceived by the respondents. Most students believe that this academic-pandemic experience has many bright aspects; they highlight that online learning saves a lot of time and offers the flexibility of class time. They also believe that they got an improved learning experience and some added they got better explanations and collected more information while being safe at home and not taking the risk of harming someone you love. On the contrary, a group of students stated that it was a bitter experience and added instructions are not as good as face to face courses, there was weak interaction with their classmates and the internet sometimes dropped while attending a zoom lecture or submitting course work. They also missed their real in-class discussions with the professors and missed a lot their campus-life.

We can conclude that the majority of the women responding to the survey are read and write learner whose took from 3 to 6 h per week to study the online courses, and the majority of the men responding to the survey are kinesthetic learner whose took from 6 to 9 h per week. However, the minority of both are aural learners who took from 6 to 9 h per week to study the online courses. Furthermore, it can be concluded that the majority of the private and public universities in Egypt took an online exam for freshman, sophomore and junior level, however, senior students took both online and research as a final exam assessment. Also, the results of this study found that the internet, platform, class time, loss of interest, motivation and self-motivation and use of online exams as an assessment can be considered as determinants of students' satisfaction with online learning.

Table 8. Summary of hypotheses testing

No.	Hypotheses	Support/reject
H1	There is a positive significant relationship between internet facilities and student satisfaction with online learning during the pandemic	Supported
H2	There is a negative significant relationship between the platform used and student satisfaction with online learning during the pandemic	Supported
H3	There is a positive significant relationship between course structure and student satisfaction with online learning during the pandemic	Rejected
H4	There is a positive significant relationship between workload and student satisfaction with online learning during the pandemic	Rejected
H5	There is a positive significant relationship between participation and student satisfaction with online learning during the pandemic	Rejected
H6	There is a positive significant relationship between class time and student satisfaction with online learning during the pandemic	Supported
H7	There is a negative significant relationship between self-motivation and student satisfaction with online learning during the pandemic	Supported
H8	There is a positive significant relationship between motivation and student satisfaction with online learning during the pandemic	Supported
H9	There is a negative significant relationship between stress and student satisfaction with online learning during the pandemic	Rejected
H10	There is a negative significant relationship between loss of interest and student satisfaction with online learning during the pandemic	Supported
H11	There is a positive significant relationship between examination method and student satisfaction with online learning during the pandemic	Supported

References

Barkley, A.P. (2002), "An analysis of online examinations in college courses", *Journal of Agricultural and Applied Economics*, Vol. 34 No. 3, pp. 445-458.

Beishuizen, J., Steffens, K. and Zimmerman, B.J. (1994), "Dimensions of academic self-regulation: a conceptual framework for education", *Self-Regulation of Learning and Performance: Issues and Educational Applications*, Vol. 1, pp. 33-21.

Bojovic, Z., Bojović, P.D., Vujošević, D. and Šuh, J. (2020), "Education in times of crisis: rapid transition to distance learning", *Distance Learning Research*.

Butz, N.T., Stupnisky, R.H., Pekrun, R., Jensen, J.L. and Harsell, D.M. (2016), "The impact of emotions on student achievement in synchronous hybrid business and public administration programs: a longitudinal test of control-value theory", *Decision Sciences Journal of Innovative Education*, Vol. 14 No. 4, pp. 441-474.

Callister, R.R. and Love, M.S. (2016), "A comparison of learning outcomes in skills-based courses: online versus face-to-face formats", *Decision Sciences Journal of Innovative Education*, Vol. 14 No. 2, pp. 243-256.

Cao, W., Fanga, Z., Hou, G., Han, M., Xu, X., Dong, J. and Zheng, J. (2020), "The psychological impact of the COVID-19 epidemic on college students in China", *Psychiatry Research*, Vol. 287, p. 112934.

Duraku, Z.H. and Hoxha, L. (2020), "The impact of COVID-19 on education and on the well-being of teachers, parents, and students: challenges related to remote (online) learning and opportunities for advancing the quality of education".

Eom, S.B. and Ashill, N. (2016), "The determinants of students' perceived learning outcomes and satisfaction in university online education: an empirical investigation", *Decision Sciences Journal of Innovative Education*, Vol. 4 No. 2, pp. 215-235.

Field, A. (2015), *Discovering Statistics Using IBM SPSS Statistics*, Sage Publications Ltd, UK.

Frankola, K. (2001), "Why online learner drop out", *Workforce*, Vol. 80, pp. 53-60.

Galusha, J.M. (1997), "Barriers to learning in distance education", *Interpersonal Computing and Technology. An Electronic Journal for the 21st Century*, Vol. 5 No. 3, pp. 6-14.

George, M.L. (2020), "Effective teaching and examination strategies for undergraduate learning during COVID-19 school restrictions", *Journal of Educational Technology Systems*, Vol. 49 No. 1, pp. 23-48.

Goda, O., Mahdy, D., Yosef, M., Amin, H.A. and Ahmed, S. (2020), "Students' awareness as an underlying factor for satisfaction and compliance", *Science Open Preprints*.

Hassan, A., Alazzeh, D., Leung, D., Sidhva, D. and Obasi, C. (2020), Investigating students' support for learning experience during COVID19 and the way forward, University of the west of Scotland UWS.

Johnson, N., Veletsianos, G. and Seaman, J. (2020), "U.S. faculty and administrators' experiences and approaches in the early weeks of the COVID-19 pandemic", *Online Learning Journal*, Vol. 24 No. 2, pp. 6-21.

LaRose, R. and Whitten, P. (2000), "Re-thinking instructional immediacy for web courses: a social cognitive exploration", *Communication Education*, Vol. 49 No. 4, pp. 320-338.

Mohamed, E.K. (2009), "Optimizing business education: a strategic response to global challenges", *Education, Business and Society: Contemporary Middle Eastern Issues*, Vol. 2 No. 4, pp. 299-311.

Moore, M.G. (1991), "Editorial: distance education theory", *American Journal of Distance Education*, Vol. 5 No. 3, pp. 1-6.

Moreno-Guerrero, A.J., Aznar-Díaz, I., Cáceres-Reche, P. and Alonso-García, S. (2020), "E-learning in the teaching of mathematics: an educational experience in adult high school", *Mathematics*, Vol. 8 No. 5, pp. 1-16.

Mukhtar, K., Javed, K., Arooj, M. and Sethi, A. (2020), "Advantages, limitations and recommendations for online learning during COVID-19 pandemic era", *Pakistan Journal of Medical Sciences*, Vol. 36, pp. 19-S4.

Niemotko, T.J. and Tolan, M. (2020), "Online accounting courses: transition and emerging issues", *The CPA Journal*, Vol. 90 No. 5, p. 11.

Onyema, E.M., Alsayed, A.O. and Sen, S. (2020), "Impact of coronavirus pandemic on education", *Journal of Education and Practice*, Vol. 11 No. 13, pp. 108-121.

Piercy, N.F. (1989), "The power and politics of sales forecasting: uncertainty absorption and the power of the marketing department", *Journal of the Academy of Marketing Science*, Vol. 17 No. 2, pp. 109-120.

Rahim, A.F.A. (2020), "Guidelines for online assessment in emergency remote teaching during the COVID-19 pandemic", *Education in Medicine Journal*, Vol. 12 No. 2, pp. 59-68.

Sahin, I. and Shelley, M.C. (2008), "Considering students' perceptions: the distance education student satisfaction model", *Educational Technology and Society*, Vol. 11 No. 3, pp. 216-223.

Sebastianelli, R., Swift, C. and Tamimi, N. (2015), "Factors affecting perceived learning, satisfaction and quality in the online MBA: a structural equation modeling approach", *Journal of Education for Business*, Vol. 90 No. 6, pp. 296-305.

Sohn, K. and Romal, J.B. (2015), "Meta-analysis of student performance in micro and macro economics: online vs face-to-face instruction", *Journal of Applied Business and Economics*, Vol. 17 No. 2, pp. 42-51.

Stowell, J.R. and Bennett, D. (2010), "Effects of online testing on student exam performance and test anxiety", *Journal of Educational Computing Research*, Vol. 42 No. 2, pp. 161-171.

˙Topal, A.D. (2016), "Examination of university students' level of satisfaction and readiness for e-courses and the relationship between them", *European Journal of Contemporary Education*, Vol. 15 No. 1, pp. 7-23.

Wang, Q. (2006), "Quality assurance – best practices for assessing online programs", *International Journal on E-Learning*, Vol. 5 No. 2, pp. 265-274.

Wickersham, L.E. and McGee, P. (2008), "Perceptions of satisfaction and deeper learning in an online course", *Quarterly Review of Distance Education*, Vol. 9, pp. 73-83.

Corresponding author
Mohamed A.K. Basuony can be contacted at: mohamed.basuony@aucegypt.edu

(A) the questionnaire of the study

Part One:

Background information:

1- What is the name of your university?.....

2- Your gender is:
- Female
- Male

3- Your college is a
- Private college
- Public college

4- Your current class level is:
- Freshman (1st year)
- Sophomore (2nd year)
- Junior (3rd year)
- Senior (4th year)

5- The **method of teaching** used in the online courses? (select all that apply)
- Pre-recorded video/ audio (Asynchronous learning)
- PowerPoint with pre-recorded audio
- Live lectures (Synchronous learning)
- Discussion with text/ images (E-mail, WhatsApp, telegram, Facebook,….)
- PowerPoint
- No online teaching
- Other, specify…….

6- The computer and Internet connection required for the classes: (select all that apply)
- is at home
- is at work
- somewhere readily available for me.
- may be difficult at times to locate.
- are not readily available to me.

7- If you are unable to join a real-time conference call class on a given day, which of the following seem to you like acceptable substitutes for in-class discussion? (select all that apply)
- Posting and reading responses to a discussion board
- Participating in a small-group online chat that could be scheduled in real time with a few students
- Using a shared document (like a Google Doc) to write a response or set of discussion notes with a few classmates

8- Studying the Online courses time was:
- 3-6 hours a week
- 6-9 hours a week
- 9-12 hours a week
- More than 12 hours a week

9- What do you consider to be the **benefits** of taking an online class? (select all that apply)
- Time saved on commute
- Flexibility of class time
- Better instruction
- Improved learning
- More interaction with the instructor
- More interaction with classmates
- Other (please specify)

10- What do you consider to be the **drawbacks** of taking an online Courses? (select all that apply)
- Instruction is not as good
- Interaction with the instructor is not as good
- Interaction with classmates is not as good
- None, I have not experienced any drawbacks
- Other (please specify)

11- In which **Student learning style** you will categorize yourself?
- You are a visual learners, as you like to be provided demonstrations and can learn through descriptions.
- You are aural learners, as you learn by listening aural and enjoy aural discussions
- You are read/write learners, as you are note takers and draw things to remember them
- You are kinesthetic learners, as you learn best by doing, and prefer hands-on experiences.

12- Your final assessment in the courses was
- Online exam
- Research
- Both

Table A1. Rate each item between (1–5) with (1) being strongly disagree and (5) being strongly agree

Variables		Questions	1	2	3	4	5
Satisfaction	A1	The academic quality of online classes is on par with face-to-face classes I have taken					
	A2	I have learned as much from online classes as I might have from a face-to-face version of the courses I have taken					
	A3	I would recommend online course instructors to other students					
	A4	I would recommend online classes to other students					
	A5	I am satisfied with the overall online course experience					
Internet	B1	There is internet access in my locality to enable me to learn on my phone or laptop					
	B2	The internet connection and speed in my locality enables me to learn on my phone or laptop					
	B3	I have adequate online learning resources in the house to aid my learning					
Platform	C1	There are sufficient IT facilities and platforms provided by my college such as e-mail, blackboard and LMS, [. . .][. . .][. . .][. . .]					
	C2	I have adequate computer skills to be able to access other online learning platforms					
Course structure	D1	The course objectives and procedures of online classes were clearly communicated					
	D2	The structure of the modules of online classes was well organized into logical and understandable components					
	D3	The instructions for online assignments are clear					
	D4	Student grading components such as assignments, projects and exams were related to the learning objectives of the online class					
	D5	The format of the online course and the content was easy to navigate					
	D6	The online help features of the online courses were helpful and understandable					
	D7	The presentation of online course topics was clear					
	D8	The requirements for completion of online courses were clearly outlined					
Stress	E1	The instructors cared about my individual learning in the online class					
	E2	The instructors in online classes were responsive to students' concerns					
	E3	I am able to study effectively from the house					
	E4	The instructors in online courses were responding to my questions promptly via e-mails, telegram, Facebook, zoom meetings, etc [. . .][. . .][. . .]					
	E5	The answers provided by the instructors in online classes were transparent and reduced my stress					
	E6	The course content and questions in the online assessments were highly correlated and, less stressful					
	E7	The time of the online assessments is enough and, less stressful					
Workload	F1	There is a high workload from the recorded lectures or live meeting					
	F2	There is a high workload from the assignments					
Class time	G1	The method of online teaching does not take more than the class time					
	G2	The method of online teaching used to make me feel that time passes quickly					

(*continued*)

Table A1.

Variables		Questions	1	2	3	4	5
Loss of interest	H1	The method of online teaching made me lose my interest					
	H2	The way of explaining the online courses made me lose my interest					
	H3	The course materials of online classes are not interesting and stimulated my desire to learn					
	H4	The course materials of online classes are not supplying me with an effective range of challenges					
Motivation	I1	The recorded videos motivated me to study					
	I2	The instructor in online courses stimulated students to exert intellectual effort beyond that required by face-to-face classes					
	I3	I had positive and constructive interactions with the instructor frequently in online classes					
	I4	The positive and constructive interactions between the instructor and students in online classes helped me improve the quality of learning outcomes					
	I5	The assignment, quizzes grades or the reward and bonus are consistent with the effort I put in the online assessment					
	I6	The instructors provided adequate feedback for online classes					
	I7	The instructors provided timely feedback for online classes					
	I8	The instructors in online classes provided timely helpful feedback on assignments, exams or projects					
	I9	The online class material really challenged me so that I can learn new things					
Self-motivation	J1	I did all that I can to make my online assignments turn out perfectly					
	J2	I worked hard to get a good grade even when I did not like an online class					
	J3	I like to be one of the most recognized students in an online class					
Participation	K1	The method of online teaching used affected the collaboration of the group					
	K2	I have been satisfied with the group assignment, group project or any work with other students in the development of the online task					
	K3	The instructor actively participated in online discussions					
	K4	I felt engaged in my online courses					
	K5	The instructors of online courses fostered competition between the students					
	K6	I have been attending and participating in zoom meetings or any live meetings made					
Exam and research	L1	I am satisfied with the online examination methods used					
	L2	I benefited from the online examination method used					