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Résumé de l'article

Cette étude visait à examiner la satisfaction des étudiants en matière d'apprentissage en ligne dans le contexte de l'enseignement à distance d'urgence. La recherche a été menée dans un plan de triangulation simultanée à partir de la méthode mixte. Les données quantitatives de l'étude ont été collectées auprès de 2,663 étudiants étudiant dans différentes facultés/écoles d'une université d'État en Turquie au cours du semestre d'automne de l'année universitaire 2020-2021. Des données qualitatives ont été collectées auprès de 494 étudiants qui ont exprimé leur opinion à travers des réponses en texte libre. Les participants sont des étudiants qui ont participé volontairement selon la méthode d'échantillonnage pratique. L'échelle de satisfaction électronique a été utilisée pour déterminer la satisfaction des étudiants en matière d'apprentissage en ligne. Le nombre de connexions au système de gestion de l'apprentissage (LMS), de connexions aux cours en direct et de vues de cours enregistrées des étudiants sont des indicateurs d'engagement comportemental. Selon les résultats, les étudiants ont un niveau de satisfaction modéré. Il existe une différence significative entre les réalisations académiques et l'engagement comportemental des étudiants avec les niveaux de satisfaction. Les étudiants ont fréquemment mentionné ces thèmes: désir de retourner à l'éducation en face à face, l'utilité du LMS, l'évaluation inadéquate, l'inefficacité de l'apprentissage en ligne, les problèmes techniques, les défis du processus et les instructeurs insuffisants. Cette étude recommande aux enseignants, aux autorités éducatives et aux décideurs politiques de prendre en compte la satisfaction des étudiants en ligne pour une transformation numérique réussie dans l'enseignement supérieur.

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Satisfaction des étudiants universitaires et engagement comportemental pendant l'enseignement à distance d'urgence

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Abstract

This study aimed to examine students' online learning satisfaction in the context of emergency remote teaching. The research was carried out using a concurrent triangulation design with mixed methods. The quantitative data were collected from 2,663 students studying at different faculties/ schools of a state university in Türkiye in the fall semester of the 2020–2021 academic year. Qualitative data were collected from 494 students who expressed their opinions through open-ended questions or free text. Participants consisted of students who participated voluntarily according to the convenient sampling method. An e-satisfaction scale was used to determine students' online learning satisfaction. The number of logins to the learning management system (LMS), logins to live courses, and recorded course views of students were considered to be behavioural engagement indicators. According to the findings, the students had a moderate level of satisfaction. There was a significant difference between both academic achievement and behavioural engagement of students with satisfaction levels. Students frequently mentioned these themes: longing for face-to-face education, the usefulness of the LMS, inadequate assessment, the inefficiency of online learning, technical problems, challenges of the process, and insufficient instructors. This study recommends that instructors, educational authorities, and policymakers consider online student satisfaction for a successful digital transformation in higher education.

Keywords: Online learning satisfaction; Emergency remote teaching; Behavioural engagement; Academic achievement

Résumé

Cette étude visait à examiner la satisfaction des étudiants en matière d'apprentissage en ligne dans le contexte de l'enseignement à distance d'urgence. La recherche a été menée dans un plan de triangulation simultanée à partir de la méthode mixte. Les données quantitatives de l'étude ont été collectées auprès de 2,663 étudiants étudiant dans différentes facultés/écoles d'une université d'État en Turquie au cours du semestre d'automne de l'année universitaire 2020-2021. Des données qualitatives ont été collectées auprès de 494 étudiants qui ont exprimé leur opinion à travers des réponses en texte libre. Les participants sont des étudiants qui ont participé volontairement selon la méthode d'échantillonnage pratique. L'échelle de satisfaction électronique a été utilisée pour déterminer la satisfaction des étudiants en matière d'apprentissage en ligne. Le nombre de connexions au système de gestion de l'apprentissage (LMS), de connexions aux cours en direct et de vues de cours enregistrées des étudiants sont des indicateurs d'engagement comportemental. Selon les résultats, les étudiants ont un niveau de satisfaction modéré. Il existe une différence significative entre les réalisations académiques et l'engagement comportemental des étudiants avec les niveaux de satisfaction. Les étudiants ont fréquemment mentionné ces thèmes: désir de retourner à l'éducation en face à face, l'utilité du LMS, l'évaluation inadéquate, l'inefficacité de l'apprentissage en ligne, les problèmes techniques, les défis du processus et les instructeurs insuffisants. Cette étude recommande aux enseignants, aux autorités éducatives et aux décideurs politiques de prendre en compte la satisfaction des étudiants en ligne pour une transformation numérique réussie dans l'enseignement supérieur.

Mots clés: Satisfaction d'apprentissage en ligne ; Enseignement à distance d'urgence ; Engagement comportemental ; Réussite académique

Introduction

The convenience and flexibility of online learning have made it a part of contemporary education (Shawai & Almaiah, 2018). Online learning provides opportunities for students to access teaching content anywhere and anytime. These opportunities have increased the use of online learning in higher education (Park & Kim, 2020). After the World Health Organization declared COVID-19 a global pandemic, education was suspended in many universities. This situation forced universities to rapidly transition to online learning.

The COVID-19 pandemic forced instructors to integrate new materials and methods into their courses in a very short time (Giray, 2021). Universities were given little time to prepare their instructors and students for digital technologies (Salas-Pilco et al., 2022). While course design normally takes months, during this crisis, it was necessary to find rapid solutions (Hodges et al., 2020). This period, called *emergency remote teaching* (ERT), brought concerns about the effectiveness of education (Ali, 2020; Cutri et al., 2020). Student satisfaction emerged as a new concern during this period (Baber, 2020).

Student satisfaction is an important part of educational activities. To carry out online learning in higher education, great attention should be paid to student satisfaction (Pangarso & Setyorini, 2023). In order not to compromise quality, the educational process should be constantly monitored (Crawford et al., 2020). Feedback from students is an important part of determining the quality of education (Giray, 2021). This feedback enables the evaluation of the process by comparing the expectations of the students with the current situation. To determine the current situation and make improvements, the satisfaction of students should be checked periodically (Gülbahar, 2012). Evaluating student satisfaction allows educational institutions to improve online learning (Kuo et al., 2014). Increasing student satisfaction also increases the brand image of universities (Shehzadi et al., 2021). Unfortunately, during the ERT period, students remained in the background as the focus was on the transition to online learning.

Educational activities have not been the same since COVID-19. The pandemic caused important changes in educational activities (Daniel, 2020). This period accelerated the transition to online learning and became a turning point for universities (Affouneh et al., 2020). Many universities are working to make online learning a permanent part of their educational activities. It is always possible to return to ERT during hurricanes, floods, earthquakes, wars, and other new situations that may occur in the future. For example, the 7.7 and 7.6 magnitude earthquakes that took place in Türkiye in February 2023 caused great destruction in 10 provinces. Because of the earthquakes in Türkiye, the Council of Higher Education (2023) decided to complete the spring term of the 2022–2023 academic year through online learning. Therefore, online learning should be a part of universities (Hodges et al., 2020), and for sustainability, online learning should be continued after crisis periods (Ye et al., 2023).

Higher education institutions are investigating how they can improve students' online performance and satisfaction. For this, it is necessary to determine firstly the qualities that affect students' online learning satisfaction (Agyeiwaah et al., 2022), engagement, and academic achievement (Butt et al., 2023). ERT has offered all stakeholders in education the opportunity to experience online learning. The experiences during this period provide important opportunities to increase the quality of online learning.

Literature Review

We reviewed literature in these three areas: emergency remote teaching; online learning satisfaction; and engagement and academic achievement.

Emergency Remote Teaching

Online learning conducted during the pandemic was a temporary solution called emergency remote teaching (ERT; Bozkurt & Sharma, 2020). Emergency remote teaching is a rapid transition from face-to-face learning to online distance learning in unplanned situations (Affouneh et al., 2020), which aims to meet the needs of students easily and reliably (Hodges et al., 2020). Although ERT and online learning are different concepts, online distance learning experiences are used in ERT and offers

all students and instructors the opportunity to experience online learning (Toquero, 2020). ERT is a great chance to evaluate and develop online learning in higher education.

Advances in computer technologies have a great impact on the popularity of online learning (Cidral et al., 2018). However, it should not be forgotten that technology is a tool, not a goal. Although they are central during a crisis period, technological solutions need reconsidering for long-term use. It should be noted that the purpose of education is learning, and teaching alone does not guarantee learning (Schlesselman, 2020). For this reason, online solutions should go beyond delivering the teaching content and focus on the quality of education (Affouneh et al., 2020). Students and their satisfaction should be the focus of online learning (Bozkurt & Sharma, 2020).

Online Learning Satisfaction

Student satisfaction is defined as students' perceptions of online learning and their experience in the learning process (Kuo et al., 2014). Satisfaction is an important factor that determines the success and quality of online learning (Moore & Kearsley, 2012). Online satisfaction is related to many sub-factors including communication and usability, teaching process, teaching content, interaction and evaluation (Gülbahar, 2012).

Daultani et al. (2021) stated that system features are an important predictor of satisfaction. The quality of the system has a positive and significant effect on students' satisfaction (Al Mulhem, 2020). Well-structured and easy-to-navigate system design increases user satisfaction (Pham et al., 2019). The ease of use of the system increases students' satisfaction and their continuous intention to use online learning (Ye et al., 2023).

The quality of the instructor and the course structure is another factor affecting satisfaction (Daultani et al., 2021; Wei & Chou, 2020). Instructor performance is an important variable that has an impact on students' online satisfaction (Herwin et al., 2022). Teaching style has a significant impact on satisfaction and is a determinant of the quality of teaching (Osman & Saputra, 2019). In addition, instructors have positive effects on student engagement and satisfaction (Pham et al., 2019). Barbera et al. (2013) stated that course design has an impact on both student satisfaction and learning.

One of the variables that affects both student satisfaction and achievement is teaching content (Barbera et al., 2013). The quality of teaching content has a positive impact on students' online learning satisfaction (Al Mulhem, 2020). Well-prepared teaching content may enable students to have a successful learning experience (Simonson et al., 2019). Teaching content in the online environment should be designed to attract students' attention and meet their needs (Kumar, 2021). Agyeiwaah et al. (2022) stated that engaging and motivating instructional content will increase students' online learning satisfaction.

It is stated that interaction is important to provide a better online learning experience and can increase the academic achievement of students (Kurucay & İnan, 2017). It is also seen that interaction is an important predictor of online learning satisfaction (Hamdan et al., 2021). Besides interaction, evaluation also has a significant impact on student satisfaction (Gee, 2018).

Engagement and Academic Achievement

Engagement refers to students' participation or effort in online activities (Henrie et al., 2015). In other words, it is the experience of students depending on the time they stay in the online learning environment (Lewis, 2011). Students' satisfaction depends on the time they spend on online activities (Gray & DiLoreto, 2016). Students' continuous intention to use online learning depends on their satisfaction (Ke & Kwak, 2013). Khan et al. (2023) stated that satisfaction plays a mediating role between the quality of online learning and engagement. At the same time, engagement is an important factor affecting the achievement of students (Baber, 2020).

Engagement is a multidimensional concept including behavioural, cognitive, and emotional engagement (Fredricks et al., 2004). This study focuses on behavioural engagement, which refers to observable behaviours related to students' learning. Behavioural engagement has a significant effect on students' learning performance, and it is positively corelated with learning performance (Tsay et al., 2018).

During the crisis, the focus was on technological solutions and students remained in the background. Student satisfaction is an important variable that directly affects the success and quality of online learning. At the same time, the success of online learning depends on the engagement of students in the educational process. Engagement is an important predictor of academic achievement. Ensuring satisfaction increases students' engagement in online learning and their academic achievement. Feedback from students gives important clues about interventions which can increase satisfaction. In this context, this study found that feedback is important in terms of revealing the needs and expectations of students which can provide valuable guidance to instructors, educational authorities, and policymakers who may be able to identify new strategies to improve online learning in higher education. It is very important to examine and scientifically report the experiences with ERT so that mistakes are not repeated.

Purpose of the Study

This study aimed to examine students' online satisfaction in the context of ERT. The research questions were:

1. What are the mean scores of online learning satisfaction of the students?
2. Does the academic achievement of students differ significantly according to online satisfaction levels?
3. Does the behavioural engagement of students differ significantly according to online satisfaction levels?
4. What is the opinion of students of online learning?

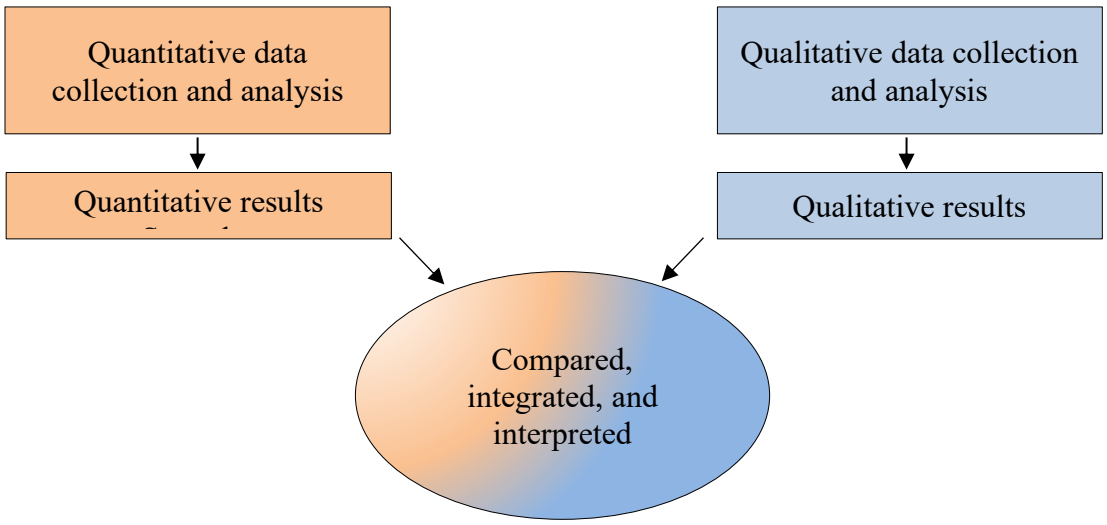
Methodology

Research Design

The research was carried out in a concurrent triangulation design using mixed methods (Creswell, 2014). Quantitative data were collected with the descriptive survey model. Qualitative data consisted of students' opinions about their experiences in online learning. Each data type was collected and analyzed separately. Statistical and thematic results were presented separately. The findings were combined and interpreted (Figure 1).

Figure 1

The Model of the Study



Sample

The quantitative data of the study were collected from 2,663 students studying at different faculties/schools in a state university in Türkiye in the fall semester of the 2020-2021 academic year. Students participated voluntarily according to the convenient sampling method. Qualitative data were collected from 494 students. All 2,663 participants responded to the e-satisfaction scale, however, 494 of these participants reported their ideas about online learning via open-ended questions or *free text*. The demographic characteristics of participants is shown in Table 1.

Table 1

Demographic Information of Participants

Variable	Group	Quantitative[a]		Qualitative[b]	
		[a]*n*	%	[b]*n*	%
Gender	Female	1,501	56.4	222	44.9
	Male	1,162	43.6	272	55.1
Grade level	First grade	1,989	74.7	229	46.4
	Second grade	354	13.3	125	25.3
	Third grade	146	5.5	69	13.9
	Fourth grade	174	6.5	71	14.4
Education level	Associate degree	1,032	61.2	145	70.6
	Licence	1,631	38.8	349	29.4
Faculty/College	Sports sciences	137	5.14	48	9.7
	Dentistry	18	0.68	5	1.0
	Education	359	13.48	83	16.8
	Marine sciences	33	1.24	5	1.0
	Arts and sciences	443	16.64	86	17.4
	Fine arts	118	4.43	24	4.9
	Theology	92	3.45	21	4.3
	Vocational schools	611	22.94	88	17.8
	Music and performing arts	23	0.86	7	1.4
	Health science	93	3.49	10	2.0
	Social sciences	202	7.59	19	3.8
	Technical sciences	219	8.22	38	7.7
	Economics and administrative sciences	203	7.62	38	7.7
	Agriculture	112	4.21	22	4.5

Note. [a] $n = 2{,}663$. [b] $n = 494$.

Implementation

The study covered a period of 17 weeks of education, with 15 weeks of lectures and 2 weeks of assessment. Education processes such as delivering teaching content, management of students, and planning of courses were carried out on the Moodle LMS. All courses were conducted live (synchronously) via the teaching platform BigBlueButton[1]. Students were able to access course recordings. Asynchronous teaching content and online activities were carried out by the instructors on the LMS. Assessments were made in the form of homework and online exams. Log records such as the number of logins to the live course, the number of recorded course views, and the number of logins to the LMS were recorded by the LMS. These log records, which showed the students' activities in online learning, were used as behavioural engagement data. At the end of the semester, students' online learning satisfaction levels were measured using the e-satisfaction scale. The scale was distributed to students online via Moodle and made available to all university students (n = 6,740) for one week. A message was sent to students asking them to respond to the scale and those who responded (39.5% of all students) were also asked to give their opinions about their online learning experiences at the end of the scale. The fall semester general grade point means were taken from the LMS.

Data Collection Tools

The e-satisfaction scale developed by Gülbahar (2012, p. 9) was used to determine students' online learning satisfaction. The Likert-type scale consists of 29 items and 4 sub-factors (Table 2).

The Cronbach's alpha reliability coefficient of the entire scale was 0.97, and sub-factors ranged from 0.91 to 0.96. A Chi-Square Goodness of Fit test revealed that the model was a good fit: $\chi 2$ (358, N = 2,699) = 3278.64, $p < .000$. Results of further testing for fitness are shown in Table 3. It is stated that the standardized coefficients of the items are between 0.26 and 0.89 and are significant at the 0.01 *p*-level. The items in the scale range from "*Never (1)*" to "*Always (5)*" according to the 5-point Likert-type grading scale.

The students' opinions regarding online learning experiences were collected through open-ended questions or free text answers. The online activities such as the number of logins to the live course, the number of recorded course views, and the number of logins to the LMS was recorded by the LMS. These log records were used as indicators to determine students' behavioural engagement in online learning. Indicators are the most common method used to determine students' behavioural engagement in online learning environments (Henrie et al., 2015).

The student's general grade point means were evaluated for academic achievement. General grade point means vary between 0.00–4.00 and reflect the students' achievement in teaching activities (Kurucay & İnan, 2017). Students' grade point means is the most important indicator of the success of academic activities, and it is used to examine the effect of instructional activities (Eom & Ashill, 2016).

[1] https://bigbluebutton.org

Table 2

E-Satisfaction Scale Sub-Factors

Sub-Factor	Items (*n*)	Definition
Communication and usability	7	Satisfaction with the usefulness and/or ease of the online learning environment
Teaching process	8	Satisfaction with instructional design and instructors
Teaching content	4	Satisfaction with the presentation of teaching content and teaching materials
Interaction and evaluation	10	Satisfaction with interactive activities and the evaluation process

Note. Items range from 1 (*never*) to 5 (*always*).

Table 3

E-Satisfaction Scale Model Fit

$\chi 2$	RMSEA	S-RMR	GFI	AGFI	CFI	NNFI	IFI
3278.64*	0.064	0.037	0.90	0.88	0.99	0.99	0.99

Note. RMSEA = root-mean-square-error of approximation; S-RMR = standardized root-mean-square residual; GFI = goodness-of-fit index; AGFI = adjusted goodness-of-fit index; CFI = comparative fit index; NNFI = nonnormed fit index; IFI = incremental fit index.

*$p < .000$.

Analysis of Research

Descriptive statistics were used to determine students' online satisfaction levels. The students were divided into three levels, low, moderate, and high, according to their satisfaction mean scores ranging from 1 to 5, according to a 5-point Likert-type scale. Between 1.00 and 2.33 was considered low level, between 2.34 and 3.67 moderate, and between 3.68 and 5.00 as high (Korkmaz et al., 2015). One-way analysis of variance (ANOVA) was used to determine whether there was a significant difference in academic achievement and engagement of students according to satisfaction levels (Tabachnick & Fidell, 2019).

Since the skewness and kurtosis values of the scores obtained from the independent samples to be compared were in the range of ±1.5, they showed a normal distribution (Tabachnick & Fidell, 2019). Since the variances and sample sizes were not equal, the Games-Howell test was used for post-hoc

multiplicity comparisons (Games, 1971). The skewness and kurtosis values of the variables and the variances between groups are shown in Table 4.

Table 4

Variances, Skewness, and Kurtosis Values of the Variables

Variable	Group	*n*	Skewness	Kurtosis	Levene statistic
Academic achievement	Low	345	-0.498	0.392	0.005
	Moderate	1,349	-0.532	0.224	
	High	969	-0.342	-0.016	
Login to LMS	Low	345	0.959	1.146	0.000
	Moderate	1,349	0.927	1.282	
	High	969	0.836	0.734	
Login to live course	Low	345	0.749	0.215	0.000
	Moderate	1,349	0.683	0.232	
	High	969	0.548	0.052	
Recorded course view	Low	345	0.852	-0.012	0.000
	Moderate	1,349	1.078	1.367	
	High	969	0.820	0.391	

Content analysis was used to reach concepts and relationships on students' opinions. Codes were generated from the qualitative data obtained from the students (Strauss & Corbin, 1990). Associated codes were brought together. These codes were shown with frequency and percentage distribution after editing. Themes were created according to the combined codes. The themes were evaluated separately, according to students with different satisfaction levels. MAXQDA[2] software was used in the analysis of qualitative data and SPSS statistical software was used in the analysis of quantitative data.

Results

Research Question 1

Mean scores were calculated by dividing the total score by the number of items in the satisfaction scale. Satisfaction mean scores and standard deviation values are shown in Table 5.

[2] https://www.maxqda.com

Table 5

Satisfaction Mean Scores and Standard Deviations

Sub-Factor	*M*	*SD*
Satisfaction scale	3.33	0.87
Communication & usability	3.58	0.89
Teaching process	3.30	0.95
Teaching content	3.51	1.06
Interaction & evaluation	3.12	1.02

Note. n = 2,663.

While students' satisfaction scores were 3.33, their satisfaction sub-factor scores ranged from 3.12 to 3.58. It can be said that the students had a moderate level of satisfaction. The highest sub-factor mean score was communication and usability, while the lowest mean score belonged to interaction and evaluation. The satisfaction score breakdown was as follows: 12.96% (n = 345) of the students had low-level satisfaction, 50.66% (n = 1,349) moderate level, and 36.39% (n = 969) high-level satisfaction. The satisfaction sub-factor means scores of the students according to their satisfaction levels are shown in Table 6.

Table 6

Satisfaction Sub-Factor Mean Scores According to Satisfaction Levels

Sub-Factor	Satisfaction level					
	Low[a] (1.00 to 2.33)		Moderate[b] (2.34 to 3.67)		High[c] (3.68 to 5.00)	
	M	SD	M	SD	M	SD
Satisfaction scale	1.86	0.33	3.06	0.36	4.25	0.39
Communication & usability	2.23	0.62	3.39	0.63	4.32	0.46
Teaching process	1.84	0.46	3.01	0.53	4.23	0.53
Teaching content	1.84	0.56	3.25	0.72	4.46	0.53
Interaction & evaluation	1.62	0.42	2.78	0.57	4.12	0.60

Note. [a] *n* = 345. [b] *n* = 1,349. [c] *n* = 969.

The sub-factor in which students with low and moderate satisfaction levels have the highest score is communication and usability. The sub-factor in which students with high satisfaction levels have the highest score is teaching content. It is seen that the lowest sub-factor mean score of all satisfaction levels is interaction and evaluation.

Research Question 2

The results of ANOVA, applied to test whether the academic achievement mean scores of the students showed a significant difference according to satisfaction level, are given in Table 7.

Table 7

ANOVA Results of Academic Achievement Scores

Satisfaction level	*N*	*M*	*SD*	*df*	*F*	*p*	Post Hoc
Low	345	2.62	0.56	2-2660	29.358*	0.000	3-1*
Moderate	1,349	2.78	0.50				3-2*
High	969	2.86	0.47				2-1*

Note. * significant at $p < 0.01$.

The results show that there is a significant difference between the academic achievements of the students according to their satisfaction levels. The post hoc (Games-Howell) test was conducted to find the difference in academic achievements of students reporting different levels of satisfaction. The results show that students with a high level of satisfaction have higher academic achievement scores than those of the moderate and low level. The academic achievement mean score of the students with moderate satisfaction level is also higher than the low-level students' academic achievement mean score.

Research Question 3

The students' behavioural engagement indicators scores are based on the number of logins to the LMS, the number of logins to live courses, and the number of recorded course views. This study showed a significant difference in engagement in terms of satisfaction levels. According to the results of the post hoc test, all engagement indicators of students with a high level of satisfaction are higher than those of the students with moderate and low levels. Likewise, indicator scores of students with a moderate level of satisfaction are higher than that of low level. ANOVA results of behavioural engagement indicators scores according to students' satisfaction levels are shown in Table 8. The distribution of behavioural engagement scores according to the satisfaction levels is depicted in Figure 2.

Table 8

ANOVA Results of Behavioural Engagement Scores

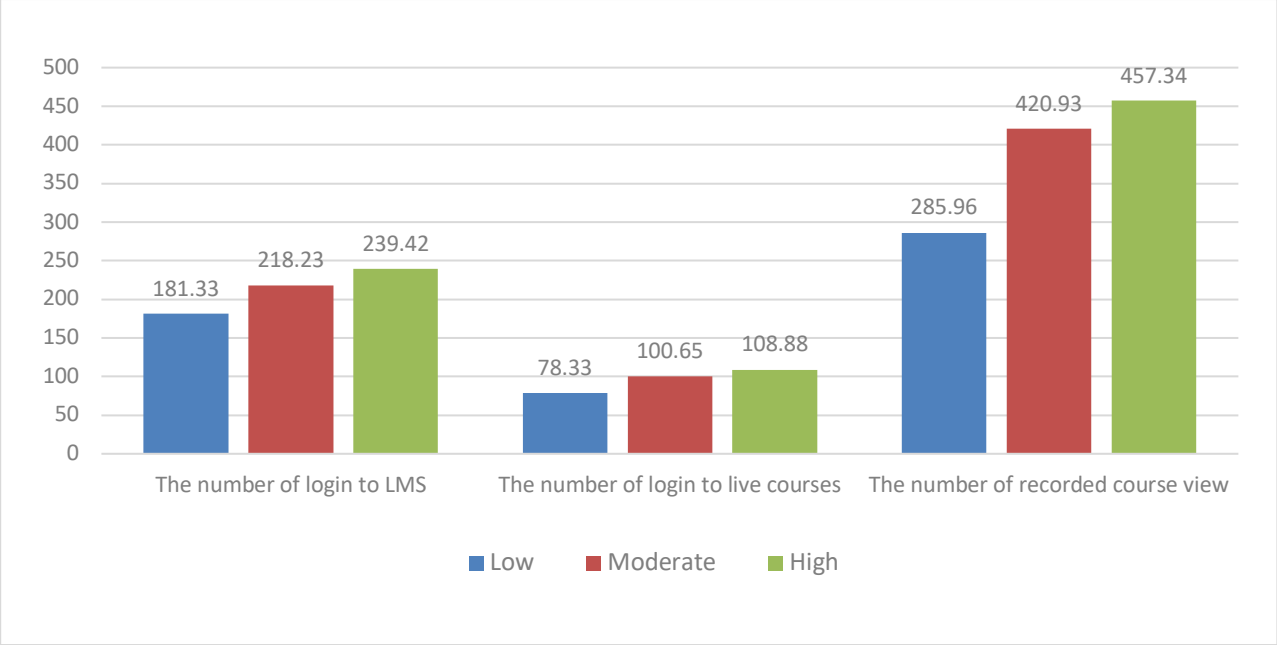
Engagement	Satisfaction level	M	SD	df	F	p	Post Hoc
Number of logins to LMS	Low[a]	181.33	89.46	2-2660	39.220*	0.000	3-1*
	Moderate[b]	218.23	104.4				3-2*
	High[c]	239.42	113.49				2-1*
Number of logins to live courses	Low[a]	78.33	54.64	2-2660	28.816*	0.000	3-1*
	Moderate[b]	100.65	65.44				3-2*
	High[c]	108.88	65.59				2-1*
Number of recorded course views	Low[a]	285.96	207.78	2-2 660	44.395*	0.000	3-1*
	Moderate[b]	420.93	299.87				3-2**
	High[c]	457.34	303.68				

Note. [a] $n = 345$. [b] $n = 1{,}349$. [c] $n = 969$.

* Significant at $p < 0.01$. ** Significant at $p < 0.05$.

Figure 2

Distribution of Behavioural Engagement Scores

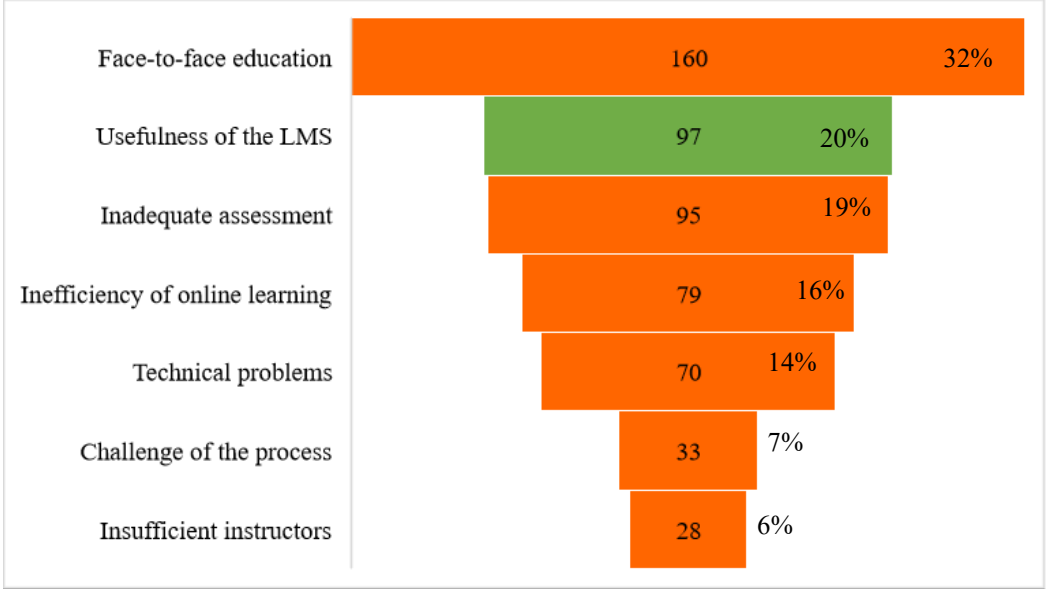


Research Question 4

The students' opinions of online learning were coded using the inductive approach, produced directly from the data. Related codes were brought together. Opinions frequently expressed by the students are shown in Figure 3. Bars with green indicate positive opinions, and orange bars indicate negative opinions.

Figure 3

Frequency and Rate of All Students' Opinions

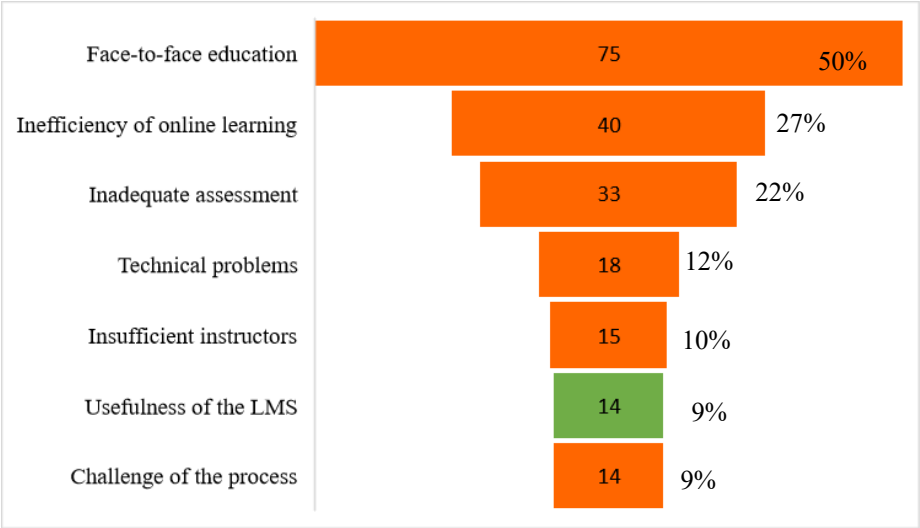


Students with low satisfaction levels generally had negative opinions. The longing for face-to-face education was most frequently mentioned, followed by problems with online learning, assessment, technical opportunities, instructors, and process. Some students gave a positive opinion about the usefulness of the LMS. The opinions most frequently expressed by students with low satisfaction levels are shown in Figure 4.

The rate of negative opinions of students at the moderate level is reduced compared to students with a low satisfaction level. The rate of positive opinion about the usefulness of the LMS increased from 9% to 15%. In addition, the issue of insufficient instructors was not mentioned. The longing for face-to-face education was the most dominant opinion (28%), followed by issues with assessment (23%), technical opportunities (17%), online learning (14%), and process (8%). The opinions most frequently expressed by students with moderate satisfaction levels are shown in Figure 5.

Figure 4

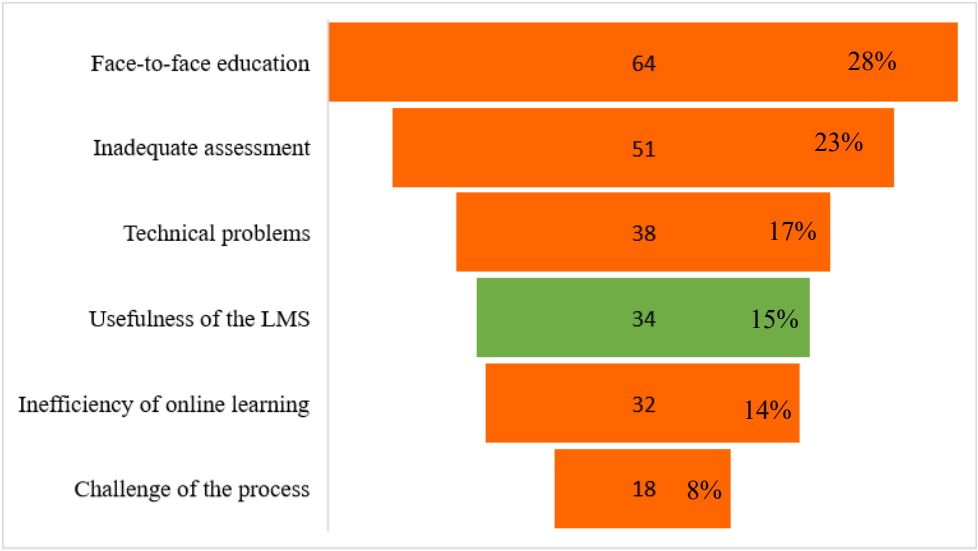
Frequency and Rate of Low Satisfaction Level Students' Opinions



Note. Green indicates a positive opinion. Orange indicates a negative opinion.

Figure 5

Frequency and Rate of Moderate Satisfaction Level Students' Opinions



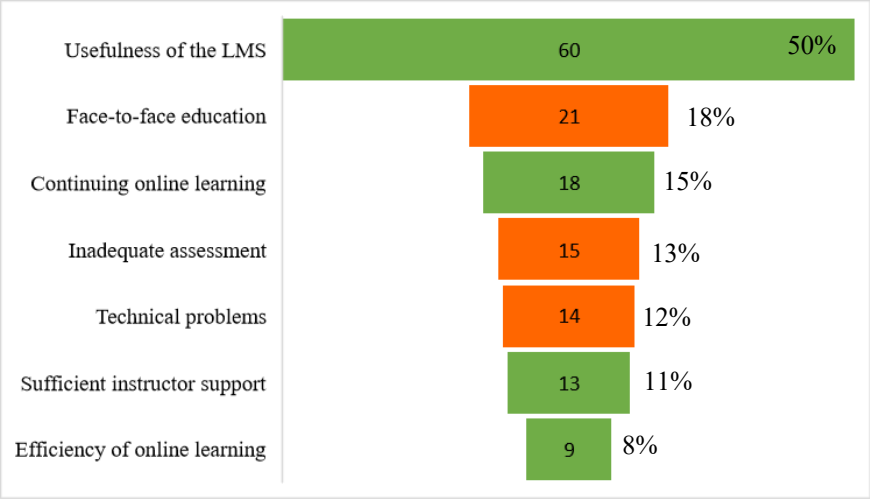
Note. Green indicates a positive opinion. Orange indicates a negative opinion.

Most of the opinions with high satisfaction levels are positive with 50% expressing a positive opinion about the LMS. Unlike the low and moderate satisfaction level students, there were students who had positive opinions about continuing online learning (15%), the support of the instructor (11%), and the efficiency of online learning (8%). Longing for face-to-face education (18%) was the most frequently mentioned negative opinion, followed by issues with assessment (13%) and technical

opportunities (12%). The opinions frequently expressed by students with high satisfaction levels are shown in Figure 6.

Figure 6

Frequency and Rate of High Satisfaction Level Students' Opinions



Note. Green indicates a positive opinion. Orange indicates a negative opinion.

Students at all satisfaction levels longed for face-to-face education. Inadequate assessment, technical problems, and the inefficiency of online learning were the negative situations mentioned by students at all three levels. The rate of negative opinions decreased as the level of satisfaction increased. While 50% of students with low satisfaction levels longed for face-to-face education, this rate was 28% for students with moderate levels and 18% for students with high levels. In contrast to the students with low and moderate satisfaction, students with high satisfaction reported more positive opinions. For these students, the LMS was useful. Similarly, students with low and moderate satisfaction levels found the process more challenging than students reporting high levels. Some of the students with high satisfaction levels wanted online learning to continue in the future. The problems expressed about the instructor by the students with low satisfaction levels turned into satisfaction at a high level.

The qualitative findings were combined with quantitative findings and interpreted within the framework of the literature in the Discussion section.

Discussion

In this study, students reported moderate satisfaction with remote learning in an emergency context. The study conducted by Giray (2021) during the pandemic period, found that the online satisfaction of students was moderate. Similarly, Agyeiwaah et al. (2022) found that students'opinions reflected moderate satisfaction. Other studies have shown that students' online satisfaction decreased

during the COVID-19 pandemic (Hamdan et al., 2021) and students were not satisfied with online learning (Hilmat et al., 2021). Giray (2021) stated that students' online learning satisfaction decreased as the courses could not be adapted to new conditions due to the rapid transition. Hilmat et al. (2021) stated that this decrease was due to the student's desire to maintain their habits in face-to-face education. The most important opinion stated by students in this study, longing for face-to-face education, also shows that students did not want to give up their previous habits. This finding shows that concerns about the difficulty providing for student satisfaction in the rapid transition from face-to-face education to online education (Baber, 2020) are not unfounded. Since most of the students in this study were introduced to online learning during the pandemic period, they were not familiar with online learning pedagogy. Therefore, students compared online learning with face-to-face education.

Communication and usability was the satisfaction sub-factor with the highest means score of students. Usefulness of the LMS was an important opinion expressed by the students. As the level of satisfaction increased, the rate of students who stated that they were satisfied with the LMS also increased. Since the quality of the LMS has a positive and significant effect on student satisfaction (Al Mulhem, 2020), increasing the usefulness of the LMS will also increase student satisfaction. Daultani et al. (2021) stated that student satisfaction will increase if the LMS is well structured in terms of content and functions. A useful and clearly designed LMS will increase students' online satisfaction. Increasing the quality of the system will increase the benefits of online learning (Al Mulhem, 2020; Pham et al., 2019). Pangarso and Setyorini (2023) recommend that universities improve the quality of their LMS to increase student satisfaction, as well as the usefulness of the LMS, and technical problems should be minimized whenever possible.

Technical problems was another factor that had an impact on students' satisfaction. Providing the necessary technical infrastructure is a basic need for online learning (Veletsianos & Houlden, 2019). Technical inadequacies emerged as an important problem that universities had to face during the pandemic period (Şenel & Şenel, 2021). Salas-Pilco et al. (2022) stated that it is necessary to improve Internet connectivity to transform higher education based on their study of the COVID-19 period. Therefore, the usefulness of the LMS as well as the ease of access to the LMS will positively affect student satisfaction.

Interaction and evaluation was the satisfaction sub-factor for which students had the lowest mean. Conrad et al. (2022) stated that the lack of student interaction negatively affects students' satisfaction. Inadequate assessment was an important opinion expressed by the students. In the literature, students stated that they worried about online assessments because online exams make cheating easier (Cabi, 2016). Assessment has a significant impact on student satisfaction (Gee, 2018). The higher the assessment score, the higher the online satisfaction of students during the pandemic period (Baber, 2020). The distrust in the assessment process and the shortness of the exam duration negatively affected their satisfaction. This situation caused students to see online learning as inefficient and their learning in the online environment as inadequate.

Students with low and moderate satisfaction levels stated that the online learning process was challenging, while students with high levels wanted online learning to continue in the future. Online

learning causes depression and anxiety disorders among university students and affects their satisfaction (Fawaz & Samaha, 2021). According to Olasina (2019), stress affects students' acceptance of online learning. As students' stress increases, their engagement (Kara, 2021) and achievement in the online learning environment decreases (Beccaria et al., 2016; Heo & Han, 2018). Pawar et al. (2022) stated that online learning satisfaction reduced students' fear and stress during the COVID-19 period. Therefore, anxiety and fear should be alleviated in order to increase satisfaction. The students' exposure to unusual situations and unusual methods put pressure on them and made it difficult to accept online learning.

The indifference of the instructor and the lack of feedback were situations that negatively affected students' satisfaction. Instructor qualification has a positive role in students' engagement and satisfaction (Daultani et al., 2021; Pham et al., 2019; Wei & Chou, 2020). Osman and Saputra (2019) stated that the teaching style of instructors has a significant effect on student satisfaction, and this is a determinant of the quality of online learning. Herwin et al. (2022) evaluated instructor performance as an important variable that has an impact on online student satisfaction. They found that the effect of the LMS on student satisfaction depends on the performance of the instructor. In this context, the attitude of the instructors and the feedback they provide have a significant effect on the satisfaction of students.

It was observed that students with high satisfaction levels also had high academic achievement. According to Schreiner and Nelson (2013), online satisfaction is related to their academic achievement. The higher the online satisfaction, the higher the assessment scores of the students during the pandemic period (Baber, 2020). In addition to the academic achievement of the students with high satisfaction, the number of logins to LMS, the number of logins to live courses, and the number of recorded course views were also high. This finding shows that satisfaction is an important factor affecting the effectiveness of online learning. Satisfaction and engagement in the online environment have a significant impact on student achievement (Cidral et al., 2018). The student's online learning satisfaction plays a key role in their decision to continue using the LMS (Ke & Kwak 2013). Engagement is a strong predictor of online learning outcomes (Baber, 2020). According to Khan et al. (2023), student satisfaction increases the impact of online learning engagement. In this context, as the online satisfaction of students increases, students engage more and their academic achievement increases. Increasing students' online satisfaction will increase the effectiveness of online learning.

Conclusion and Implications

This study offers valuable insights into the research questions of this paper. Emergency remote teaching offered all educational stakeholders the opportunity to experience online learning. This was a crucial opportunity to examine online learning in a large sample and make improvements. For this reason, instead of considering this period as a temporary measure, it is necessary to consider it as a step forward. The results obtained in this study provide important clues about what should be done to improve online learning. Student satisfaction is an important factor that determines the effectiveness of online learning. This study suggests that institutions evaluate online student satisfaction for successful

digital transformation in higher education. These results will guide instructors, educational authorities, and policymakers to improve their online learning practices in higher education.

The COVID-19 pandemic has exposed students to an environment they had not experienced before. Most of the students had to deal with online learning during the pandemic period. The combination of the obligation to stay at home and this unusual learning environment created extra stress. This stress made it difficult for students to accept online learning and created dissatisfaction. In this rapid transition, online courses could not be designed in accordance with online learning pedagogy. Courses designed for face-to-face education were transferred into an online environment. However, the course structure should be reorganized to improve student's learning outcomes and support the pedagogical structure of online learning.

Another challenge is the conversion of assessment to the online learning environment. Since the instructors could not make necessary preparations, they simply transferred the questions used in face-to-face education to the online environment. Students evaluated the online assessment according to their experiences in face-to-face education. Unproctored exams were the first choice for assessment in this rapid transition. To prevent cheating, some restrictions were made such as random question selection and reducing the exam time. This situation created dissatisfaction among students. Students' dissatisfaction can be prevented by preferring proctored exams or by using assessment methods suitable for the online learning environment.

Limitations

In this study, student satisfaction was evaluated on an e-satisfaction scale with four sub-factors. In future studies, the scope of satisfaction could be expanded to include different factors that might have an impact on online student satisfaction.

The results of this study are based on the online learning experiences of students in Türkiye. The experiences of students from different cultures and backgrounds may differ.

This study did not directly examine students' online learning experience. This study examined students' ERT experience in the context of the COVID-19 pandemic.

References

Affouneh, S., Salha, S., & Khlaif, Z. N. (2020). Designing quality e-learning environments for emergency remote teaching in coronavirus crisis. *Interdisciplinary Journal of Virtual Learning in Medical Sciences*, *11*(2), 135–137. https://doi.org/10.30476/IJVLMS.2020.86120.1033

Agyeiwaah, E., Baiden, F. B., Gamor, E., & Hsu, F. C. (2022). Determining the attributes that influence students' online learning satisfaction during COVID-19 pandemic. *Journal of Hospitality, Leisure, Sport & Tourism Education, 30*, Article 100364. https://doi.org/10.1016/j.jhlste.2021.100364

Al Mulhem, A. (2020). Investigating the effects of quality factors and organizational factors on university students' satisfaction of e-learning system quality. *Cogent Education*, *7*(1), Article 1787004. https://doi.org/10.1080/2331186X.2020.1787004

Ali, W. (2020). Online and remote learning in higher education institutes: A necessity in light of COVID-19 pandemic. *Higher Education Studies*, *10*(3), 16–25. https://doi.org/10.5539/hes.v10n3p16

Baber, H. (2020). Determinants of students' perceived learning outcome and satisfaction in online learning during the pandemic of COVID-19. *Journal of Education and e-Learning Research*, *7*(3), 285–292. https://doi.org/10.20448/JOURNAL.509.2020.73.285.292

Barbera, E., Clara, M., & Linder-Vanberschot, J. A. (2013). Factors influencing student satisfaction and perceived learning in online courses. *E-learning and Digital Media*, *10*(3), 226–235. https://doi.org/10.2304/elea.2013.10.3.226

Beccaria, L., Rogers, C., Burton, L., & Beccaria, G. (2016). Role of health-promoting behaviours for on-campus and distance education students. *Distance Education*, *37*(1), 22–40. https://doi.org/10.1080/01587919.2016.1158768

Bozkurt, A., & Sharma, R. C. (2020). Emergency remote teaching in a time of global crisis due to CoronaVirus pandemic. *Asian Journal of Distance Education*, *15*(1), i–vi. http://www.asianjde.com/ojs/index.php/AsianJDE/article/view/447

Butt, S., Mahmood, A., Saleem, S., Murtaza, S. A., Hassan, S., & Molnár, E. (2023). The contribution of learner characteristics and perceived learning to students' satisfaction and academic performance during COVID-19. *Sustainability, 15*(2), Article 1348. https://doi.org/10.3390/su15021348

Cabi, E. (2016). The perception of students on e-assessment in distance education. *Journal of Higher Education & Science, 6*(1), 94–101. https://dergipark.org.tr/en/pub/higheredusci/issue/61489/918150

Cidral, W. A., Oliveira, T., Di Felice, M., & Aparicio, M. (2018). E-learning success determinants: Brazilian empirical study. *Computers & Education*, *122*, 273–290. https://doi.org/10.1016/j.compedu.2017.12.001

Conrad, C., Deng, Q., Caron, I., Shkurska, O., Skerrett, P., & Sundararajan, B. (2022). How student perceptions about online learning difficulty influenced their satisfaction during Canada's Covid-19 response. *British Journal of Educational Technology, 53*(3), 534–557. https://doi.org/10.1111/bjet.13206

Council of Higher Education. (2023, February 11). *News announcement term of the 2022–2023 academic year distance education* [Press release]. https://www.yok.gov.tr/en/Sayfalar/news/2023/announcement-term-of-the-2022-2023-academic-year-distance-education.aspx

Crawford, J., Butler-Henderson, K., Rudolph, J., Malkawi, B., Glowatz, M., Burton, R., Magni, P., & Lam, S. (2020). COVID-19: 20 countries' higher education intra-period digital pedagogy responses. *Journal of Applied Learning & Teaching*, *3*(1), 1–20. https://doi.org/10.37074/jalt.2020.3.1.7

Creswell, J. W. (2014). *A concise introduction to mixed methods research*. Sage Publications.

Cutri, R. M., Mena, J., & Whiting, E. F. (2020). Faculty readiness for online crisis teaching: Transitioning to online teaching during the COVID-19 pandemic. *European Journal of Teacher Education*, *43*(4), 523–541. https://doi.org/10.1080/02619768.2020.1815702

Daniel, S. J. (2020). Education and the COVID-19 pandemic. *PROSPECTS*, *49*(1), 91–96. https://doi.org/10.1007/s11125-020-09464-3

Daultani, Y., Goswami, M., Kumar, A., & Pratap, S. (2021). Perceived outcomes of e-learning: Identifying key attributes affecting user satisfaction in higher education institutes. *Measuring Business Excellence*, *25*(2), 216–229. https://doi.org/10.1108/MBE-07-2020-0110

Eom, S. B., & Ashill, N. (2016). The determinants of students' perceived learning outcomes and satisfaction in university online education: An update. *Decision Sciences Journal of Innovative Education*, *14*(2), 185–215. https://doi.org/10.1111/dsji.12097

Fawaz, M., & Samaha, A. (2021). E-learning: Depression, anxiety, and stress symptomatology among Lebanese university students during COVID-19 quarantine. *Nursing Forum*, *56*(1), 52–57. https://doi.org/10.1111/nuf.12521

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/10.3102/00346543074001059

Games, P. A. (1971). Multiple comparisons of means. *American Educational Research Journal*, *8*(3), 531–564. https://doi.org/10.3102/00028312008003531

Gee, N. C. (2018). The impact of lecturers' competencies on students' satisfaction. *Journal of Arts and Social Sciences, 1*(2), 74–86. https://ruijass.com/the-influence-of-job-satisfaction-and-employee-turnover-intention-among-manufacturing-industry-in-malaysia-2/

Giray, G. (2021). An assessment of student satisfaction with e-learning: An empirical study with computer and software engineering undergraduate students in Turkey under pandemic conditions. *Education and Information Technologies*, *26*, 6651–6673. https://doi.org/10.1007/s10639-021-10454-x

Gray, J. A., & DiLoreto, M. (2016). The effects of student engagement, student satisfaction, and perceived learning in online learning environments. *International Journal of Educational Leadership Preparation*, *11*(1). https://eric.ed.gov/?id=EJ1103654

Gülbahar, Y. (2012). Study of developing scales for assessment of the levels of readiness and satisfaction of participants in e-learning environments. *Ankara University Journal of Faculty of Educational Sciences*, *45*(2), 119–138. https://doi.org/10.1501/Egifak_0000001256

Hamdan, K. M., Al-Bashaireh, A. M., Zahran, Z., Al-Daghestani, A., Al-Habashneh, S., & Shaheen, A. M. (2021). University students' interaction, Internet self-efficacy, self-regulation and satisfaction with online education during pandemic crises of COVID-19. *International Journal of Educational Management*, *35*(3), 713–725. https://doi.org/10.1108/IJEM-11-2020-0513

Henrie, C. R., Bodily, R., Manwaring, K. C., & Graham, C. R. (2015). Exploring intensive longitudinal measures of student engagement in blended learning. *The International Review of Research in Open and Distributed Learning*, *16*(3), 131–155. https://doi.org/10.19173/irrodl.v16i3.2015

Heo, J., & Han, S. (2018). Effects of motivation, academic stress and age in predicting self-directed learning readiness (SDLR): Focused on online college students. *Education and Information Technologies*, *23*(1), 61–71. https://doi.org/10.1007/s10639-017-9585-2

Herwin, H., Fathurrohman, F., Wuryandani, W., Dahalan, S. C., Suparlan, S., Firmansyah, F., & Kurniawati, K. (2022). Evaluation of structural and measurement models of student satisfaction in online learning. *International Journal of Evaluation and Research in Education, 11*(1), 152–160. https://doi.org/10.11591/ijere.v11i1.22115

Hilmat, A. N., Takal, M. H., & Hakimi, M. F. (2021). Afghan students' satisfaction from online learning during COVID-19 at Kandahar University, Kandahar, Afghanistan. *American International Journal of Social Science Research*, *6*(1), 16–29. https://doi.org/10.46281/aijssr.v6i1.931

Hodges, C., Moore, S., Lockee, B., Trust, T., & Bond, A. (2020). The difference between emergency remote teaching and online learning. *EDUCAUSE*, *27*(1), 1–9. http://hdl.handle.net/10919/104648

Kara, M. (2021). Revisiting online learner engagement: Exploring the role of learner characteristics in an emergency period. *Journal of Research on Technology in Education*, *54*(sup1), S236-S252. https://doi.org/10.1080/15391523.2021.1891997

Ke, F., & Kwak, D. (2013). Constructs of student-centered online learning on learning satisfaction of a diverse online student body: A structural equation modeling approach. *Journal of Educational Computing Research*, *48*(1), 97–122. https://doi.org/10.2190/EC.48.1.e

Khan, E. A., Cram, A., Wang, X., Tran, K., Cavaleri, M., & Rahman, M. J. (2023). Modelling the impact of online learning quality on students' satisfaction, trust and loyalty. *International Journal of Educational Management*. https://doi.org/10.1108/IJEM-02-2022-0066

Korkmaz, Ö., Çakır, R. & Tan, S. (2015). Students e-learning readiness and satisfaction levels and effects on the academic achievement. *Ahi Evran University Journal of Kırşehir Education Faculty*, *16*(3), 219–241. https://dergipark.org.tr/en/pub/kefad/issue/59449/854082

Kumar, S. P. (2021). Impact of online learning readiness on students satisfaction in higher educational institutions. *Journal of Engineering Education Transformations*, *34*(special issue), 64–70. https://doi.org/10.16920/jeet/2021/v34i0/157107

Kuo, Y.-C., Walker, A. E., Schroder, K. E. E., & Belland, B. R. (2014). Interaction, Internet self-efficacy, and self-regulated learning as predictors of student satisfaction in online education courses. *The Internet and Higher Education*, *20*, 35–50. https://doi.org/10.1016/j.iheduc.2013.10.001

Kurucay, M., & İnan, F. A. (2017). Examining the effects of learner-learner interactions on satisfaction and learning in an online undergraduate course. *Computers & Education*, *115*, 20–37. https://doi.org/10.1016/j.compedu.2017.06.010

Lewis, A. D., Huebner, E. S., Malone, P. S., & Valois, R. F. (2011). Life satisfaction and student engagement in adolescents. *Journal of Youth and Adolescence*, *40*(3), 249–262. https://doi.org/10.1007/s10964-010-9517-6

Moore, M. G., & Kearsley, I. G. (2012). *Distance education: A systems view of online learning*. Wadsworth Publishing Company.

Olasina, G. (2019). Human and social factors affecting the decision of students to accept e-learning. *Interactive Learning Environments, 27*(3), 363–376. https://doi.org/10.1080/10494820.2018.1474233

Osman, A. R., & Saputra, R. S. (2019). A pragmatic model of student satisfaction: A viewpoint of private higher education. *Quality Assurance in Education*, *27*(2), 142–165. https://doi.org/10.1108/QAE-05-2017-0019

Pangarso, A., & Setyorini, R. (2023). The drivers of e-learning satisfaction during the early COVID-19 pandemic: Empirical evidence from an Indonesian private university. *Cogent Education, 10*(1), Article 2149226. https://doi.org/10.1080/2331186X.2022.2149226

Park, C., & Kim, D. G. (2020). Exploring the roles of social presence and gender difference in online learning. *Decision Sciences: Journal of Innovative Education*, *18*(2), 291–312. https://doi.org/10.1111/dsji.12207

Pawar, A. B., Khemnar, V., Londhe, R., William, P., & Jawale, M. A. (2022). Discriminant analysis of student's online learning satisfaction during COVID-19. In *2022 International Conference on Sustainable Computing and Data Communication Systems (ICSCDS)* (pp. 260–263, Article 21744361), IEEE. https://doi.org/10.1109/ICSCDS53736.2022.9760895

Pham, L., Limbu, Y. B., Bui, T. K., Nguyen, H. T., & Pham, H. T. (2019). Does e-learning service quality influence e-learning student satisfaction and loyalty? Evidence from Vietnam. *International Journal of Educational Technology in Higher Education*, *16*(1), Article 7. https://doi.org/10.1186/s41239-019-0136-3

Salas-Pilco, S. Z., Yang, Y., & Zhang, Z. (2022). Student engagement in online learning in Latin American higher education during the COVID-19 pandemic: A systematic review. *British Journal of Educational Technology, 53*(3), 593–619. https://doi.org/10.1111/bjet.13190

Schlesselman, L. S. (2020). Perspective from a teaching and learning center during emergency remote teaching. *American Journal of Pharmaceutical Education*, *84*(8), 1042–1044. https://doi.org/10.5688/ajpe8142

Schreiner, L. A., & Nelson, D. D. (2013). The contribution of student satisfaction to persistence. *Journal of College Student Retention: Research, Theory & Practice*, *15*(1), 73–111. https://doi.org/10.2190/CS.15.1.f

Şenel, S., & Şenel, H. C. (2021). Remote assessment in higher education during COVID-19 pandemic. *International Journal of Assessment Tools in Education*, *8*(2), 181–199. https://doi.org/10.21449/ijate.820140

Shawai, Y. G., & Almaiah, M. A. (2018). Malay language mobile learning system (MLMLS) using NFC technology. *International Journal of Education and Management Engineering*, *8*(2), 1–7. https://doi.org/10.5815/ijeme.2018.02.01

Shehzadi, S., Nisar, Q. A., Hussain, M. S., Basheer, M. F., Hameed, W. U., & Chaudhry, N. I. (2021). The role of digital learning toward students' satisfaction and university brand image at educational institutes of Pakistan: A post-effect of COVID-19. *Asian Education and Development Studies*, *10*(2), 276–294. https://doi.org/10.1108/AEDS-04-2020-0063

Simonson, M., Zvacek, S. M., & Smaldino, S. (2019). *Teaching and learning at a distance: Foundations of distance education*. Information Age Publishing.

Strauss, A., & Corbin, J. M. (1990). *Basics of qualitative research: Grounded theory procedures and techniques*. Sage Publications.

Tabachnick, B. G., & Fidell, L. S. (2019). *Using multivariate statistics*. Pearson.

Toquero, C. M. (2020). Emergency remote teaching amid COVID-19: The turning point. *Asian Journal of Distance Education*, *15*(1), 185–188. http://www.asianjde.com/ojs/index.php/AsianJDE/article/view/450

Tsay, C. H.-H., Kofinas, A., & Luo, J. (2018). Enhancing student learning experience with technology-mediated gamification: An empirical study. *Computers & Education*, *121*, 1–17. https://doi.org/10.1016/j.compedu.2018.01.009

Veletsianos, G., & Houlden, S. (2019). An analysis of flexible learning and flexibility over the last 40 years of *Distance Education*. *Distance Education*, *40*(4), 454–468. https://doi.org/10.1080/01587919.2019.1681893

Wei, H. C., & Chou, C. (2020). Online learning performance and satisfaction: Do perceptions and readiness matter? *Distance Education*, *41*(1), 48–69. https://doi.org/10.1080/01587919.2020.1724768

Ye, J. H., Lee, Y. S., Wang, C. L., Nong, W., Ye, J. N., & Sun, Y. (2023). The continuous use intention for the online learning of Chinese vocational students in the post-epidemic era: The extended technology acceptance model and expectation confirmation theory. *Sustainability, 15*(3), Article 1819. https://doi.org/10.3390/su15031819

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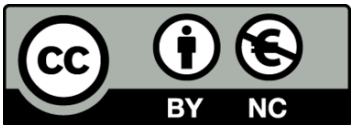

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