

ADVANCES IN GLOBAL EDUCATION AND RESEARCH

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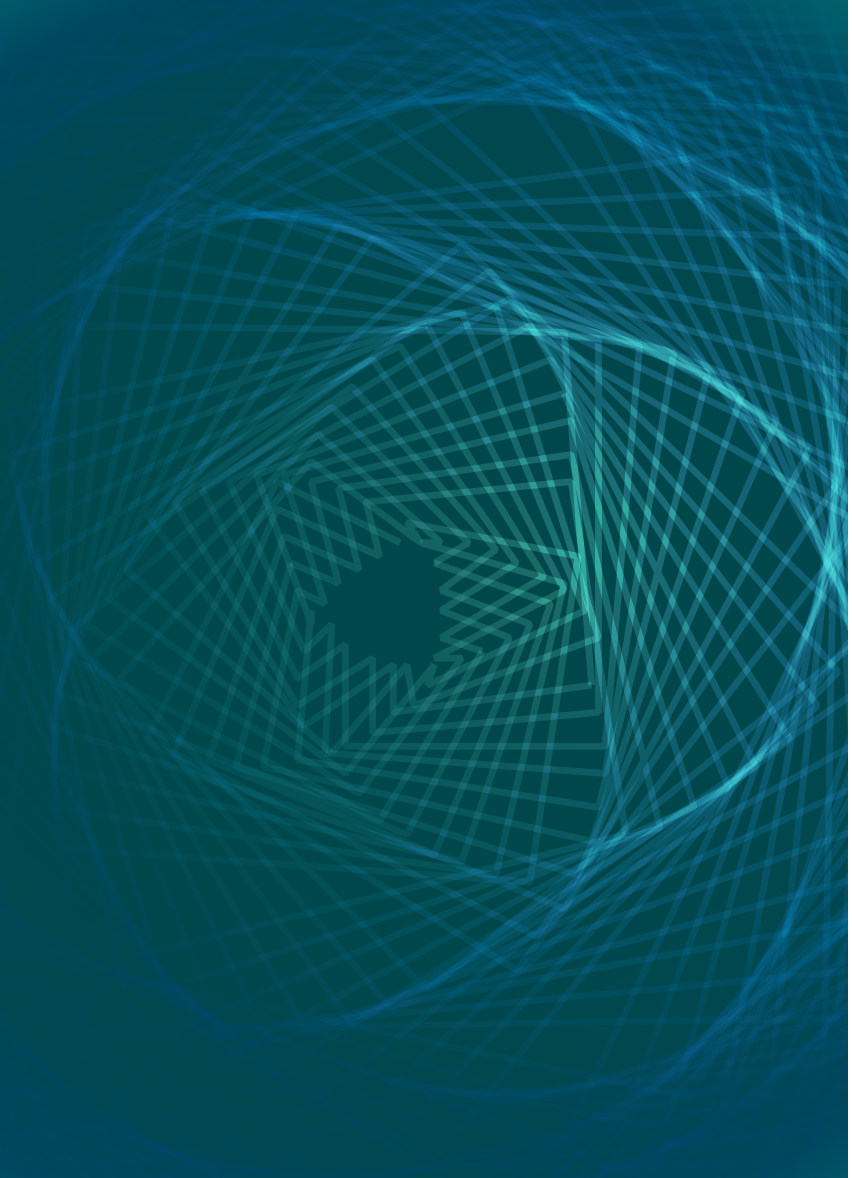
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Editors:

Dr. Wayne B. James

Dr. Cihan Cobanoglu

Dr. Muhittin Cavusoglu



Co-Editors

Dr. Wayne James, University of South Florida, USA

Dr. Cihan Cobanoglu, University of South Florida, USA

Dr. Muhittin Cavusoglu, Northern Arizona University, USA

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Determining the Effect of Student-Content Interaction, Instructor-Student Interaction and Student-Student Interaction on Online Education Satisfaction Level

Birgul Aydin

Faculty of Art and Design
Dogus University, Turkey

Abstract

The aim of this research is to introduce the factors that affect the online education satisfaction level. The related data was obtained from 208 people via online platforms using the random sampling technique. Exploratory factor analysis was performed for verifying dimensions. Multiple linear regression analysis was applied in order to determine the factors affecting the online education satisfaction level. As a result of the analysis four dimensions of online education satisfaction were determined and it was concluded that student-content interaction, instructor-student interaction, and student-student interaction have a significant effect on online education satisfaction. Findings of research contribute to literature and suggestions for online education system how interaction can be raised during the online course.

Keywords: student, instructor, content, interaction, online, education

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Introduction

Developments in information technology direct the realization of education in different fields as in every field. Online learning opportunities have been increasing rapidly in higher education in recent years. Since students have access to online programs regardless of geographic borders, the competition is increased in online education leadership programs. In this context, online programs are created to serve a more geographically dispersed student population. While online education is being implemented for specified programs, with the Covid-19 epidemic, the education system has completely changed direction all over the world. As of March 2020, Covid-19 has undergone a radical change in the country leading to online learning, where education is virtually carried out on digital platforms. The online education system has been implemented from kindergarten to graduate education (Moralista & Oducado, 2020). However, this presents both opportunities and challenges for higher education institutions and students. In this context, instructors are obliged to create content about how to encourage their students to continue their distance education. Besides, it is easy for those who are able to access the internet and other resources, but there are difficulties.

Software crashes or poor access are very common when many people use online platforms at the same time. Beyond the challenges faced, the rapid adoption of new technology in face-to-face training may lead to a return to less conducive pedagogy. Providing effective communication as in face-to-face training can be difficult on online platforms. In this case, changes in learning habits can make learning difficult. The size of the interaction in a virtual classroom is more difficult than

in a face-to-face classroom (Bakker & Wagner, 2020). Those who study online may not be able to visit a physical campus location and may have difficulty relating to faculty and other students. Thus, these differences should be understood and taken into account in examining the online education process. Therefore, there is a need to determine the effects of the factors that affect the online education satisfaction level. In this context, the aim of this research is to examine the level of online education satisfaction within the scope of interaction with student-instructor, student-student, and student-content. The determination of the factors affecting the online education satisfaction of the research is important in terms of revealing both the literature and practical results.

Literature Review

The proper management of the distance education process is important in terms of efficiency. In this context, the issue of establishing student satisfaction and satisfaction comes to the fore in the effective management of the process. In cases where student satisfaction cannot be achieved, it can be difficult to achieve efficiency. Student satisfaction is the perception of students about the experience and the value of the education which he/she receives while attending an educational institution (Astin, 1993). Each student spends their time, money, and effort in order to have a good education (Knox, 1993). Therefore, being satisfied is an important "intermediate result" in that it affects the motivation level of the student, which is an important factor in academic success. In online education there are not any physical facilities. Therefore, the disappearance of physical areas in online education carries this situation to a different dimension (Donohue & Wong, 1997).

In distance education, structures such as practice, distance, independence, distance and interaction emerge. Interaction is a term that has so many meanings that it is almost useless unless specific sub-meanings are defined and generally agreed upon (Moore, 1989). In this context, student interaction encompasses three types of interaction: instructor-student, student-content, and student-student (Moore, 1989; Berge, 2002).

Instructor-student interaction can include encouraging students 'motivation and interest in course content, organizing students' learning process, and providing students with guidance, backing, and emboldening (Sher, 2009). Besides that, the most important issue is the quality of this interaction. The quality of instructor-student interaction has an effect on student satisfaction (Chang & Fisher, 2003; Garrison, 2009). Therefore, student satisfaction is related to the performance of the instructor (Hiltz & Turrof, 1993; DeLoach & Greenlaw, 2007). In this process, the instructor stands out not only as a facilitator of learning but also as a source of motivation for the student (Moore, 1989). Instructors are the ones who is responsible of providing all kinds of interactions in distance education courses. In distance education students may have feelings of insulate and frustration and anxiety if there is a lack of communication and interaction (Mood, 1995). The instructor may design materials that aimed at motivating, presenting, facilitating implementation, evaluation, and even some degree of affective support to the learner. However, the lack of individual student-to-instructor feedback makes these teaching procedures rather general rather than individual, leaving the ultimate responsibility for maintaining motivation, interacting with the presentation, analyzing the success of the practice, and diagnosing difficulties in the students themselves (Moore, 1989).

Student-content interaction corresponds to a one-way process of elaborating and reflecting on the course content (Ertmer et. al, 2011). Students' interaction with content initiates an internal learning conversation that takes place as part of the course or content experience. Student-content interaction is an important feature of education which is the process of interacting intellectually with content that results in changes in the student's understanding, the student's perspective, or the cognitive structures of the student's mind (Moore-1989). Students cognitively detail, organize and reflect the new information they acquire by integrating previous knowledge (Moore & Kearsley, 1996).

Student-student interaction is often considered as an indicator of student satisfaction in online courses (Lindblom-Ylänne et.al, 2003). Inter-student interaction is between students, with or without the real-time presence of an instructor. Student-student interaction between members of the class or another group is sometimes an extremely valuable resource for learning (Moore, 1989).

Using the technology with the right pedagogy improves the interactive process between students and instructors or content (Jain, 2011). In the research of Su et al. (2005), it was determined that the interaction of both instructors and students is important for the learning process. In the study of Palloff and Pratt (2001), it was determined that a successful learning experience cannot be created without instructor-student interaction. In the study of Thurmond (2003), it is determined that student-instructor interaction is the most important predictor of student satisfaction. Similarly, in the research of Bolliger and Martindale (2004), it is found that student-instructor interaction has an important role in student satisfaction.

Methods

The aim of the research to determine the factors affecting the online education satisfaction level. In this context, the hypotheses created in the study to determine the effect of student-student interaction, instructor-student interaction, and student-content interaction on satisfaction are as follows:

- H₁: Student-student interaction affects online education satisfaction level.
- H₂: Instructor-student interaction affects online education satisfaction level.
- H₃: Student-content interaction affects online education satisfaction level.

Measurement

A literature review was initiated to create the survey in the research. As a result of the literature review, the patterns related to online education satisfaction level, instructor-student interaction, and student-student interaction were determined based on studies of Song et al. (2004), McLaren (2010), and Kuo et al. (2014). In order to evaluate content validity and comprehensibility, the patterns were presented to the opinions of five academicians. In line with expert opinions, 35 propositions were determined for the scale. A 5-point Likert scale was prepared for the questionnaire, ranging from strongly disagree (1) to strongly agree (5).

Sample and Data Collection

The research was conducted between November 2020 and December 2020 including the pilot study. Data was collected from online platforms. The universe of the study consisted of online

education people in Turkey. The random sampling method was applied in the study. A survey questionnaire was applied to collect data. 208 questionnaires were obtained through online platforms.

Data Analysis

One of the important stages of understanding whether the data is suitable for statistical analysis is the control of the normality distribution feature of the data. In the control of univariate normality distribution, skewness and kurtosis values were examined. When the data were examined, it was determined that the kurtosis and skewness values of all variables were below ± 2 and the data showed normal distribution (Cameron, 2004: 544; George and Mallery, 2003: 98). 208 questionnaires obtained in the study were used in the analysis of the data.

For analyzing data Exploratory Factor Analysis (EFA) was applied to determine the dimensions of the online education satisfaction level which are the components. After that, multiple linear regression analysis was performed to determine the effect of student-student interaction, instructor-student interaction, and student-content interaction on online education satisfaction level.

Findings

Findings Regarding the Demographic Characteristics of the Participants

The gender and ages of participants are distributed as 70.2% of female; 29.8% of male and those aged 15-25 33.7%, 26-35 51.9%, 36-45 13.5%. 46-55 1.0%. Education levels of the participants: primary education (4.8%); high school (14.9%); associate degree (2.4%); undergraduate (57.7%); master's (15.4%); PhD (4.8%). The level of Income in TL: 1000-2324 (27.9%); 2325-3500 (18.8%); 3501-4500 (12.0); 4501-5000 (11.1%); 5001 and above (30.3%). When it comes to online education experience, the rate of those who previously received online education is 43.8%; the rate of those who receive online education for the first time is 56.3%.

Table 1. Findings Regarding the Demographic Characteristics of the Participants

Gender	N	%	Marital status	N	%
Female	146	70,2	Married	152	73,1
Male	62	29,8	Single	56	26,9
Total	208	100,0	Total	208	100,0
Education	N	%	Income	N	%
Primary education	10	4,8	1000-2324	58	27,9
High School	31	14,9	2325-3500	39	18,8
Associate Degree	5	2,4	3501-4500	25	12,0
Undergraduate	120	57,7	4501-5000	23	11,1
Master	32	15,4	5001 and above	63	30,3
Doctorate	10	4,8	Total	208	100,0
Total	208	100,0	Online Course Experience	N	%
Age	N	%	I studied online before.	91	43,8
15-25	70	33,7	This is the first time I am studying online.	117	56,3
26-35	108	51,9	Total	208	100,0
36-45	28	13,5			
46-55	2	1,0			
Total	208	100,0			

Findings Regarding the Exploratory Factor Analysis of the Online Education Satisfaction Level Scale

In the analysis of online education satisfaction level structures Exploratory Factor Analysis (EFA) was used. EFA results regarding the online education satisfaction level scale are shown in Table 2. The KMO value of the scale is 0.931 (Hair et al. 2010: 104). In the Bartlett test, the significance value was determined as $p = 0.000 < 0.05$.

Table 2. Findings Regarding Exploratory Factor Analysis

Factors	Factor Loadings	Eigenvalue	Variance Explained
Online Education Satisfaction Level ($\alpha: 0,937$)		12,221	45,261
I improved my ability to communicate about the topics covered in the classes.	0,795		
Interacting with other students and instructors through online platforms becomes more natural as the class progresses.	0,776		
It is easy to follow class discussions in online classes.	0,745		
I feel like I have sufficient opportunities to participate in class discussions.	0,726		
Taking classes online saves me a lot of time going to class.	0,679		
I feel that the quality of class discussions throughout the lesson is high.	0,670		
I learn more in online classes than in face-to-face classes.	0,633		
If I need to attend different classes over the Internet, I will gladly do so.	0,633		
Class dynamics are not that different from other lessons I took face to face.	0,611		
I am equally satisfied with online and face-to-face training.	0,587		
The level of interaction between class participants is high.	0,529		
I learned to determine the basic subjects of the courses in online education.	0,463		
Student-instructor interaction is more difficult than the classes I took face to face.	0,411		
Student-Content Interaction ($\alpha: 0,825$)		1,032	3,821
There is no serious disadvantage to taking classes online.	0,846		
I am satisfied with the time required for the classes.	0,595		
I feel that the lessons are meeting my needs well.	0,585		
Taking courses online allows me to spend more time on non-work-related activities.	0,467		
The way the courses are taught disappoints me.	0,451		
Instructor-Student Interaction ($\alpha: 0,864$)		1,753	6,494
The instructor often tries to provide student interaction.	0,923		
The instructor often asks the students for their opinions.	0,853		
The instructor encourages students to speak by asking questions to the students.	0,784		
Overall, the instructor is effective in motivating students to interact in the lesson.	0,555		
Student-Student Interaction ($\alpha: 0,861$)		2,326	8,616
Students rarely ask each other questions.	0,890		
In online classes, students rarely express their opinions to each other.	0,851		
Students rarely answer each other's questions.	0,486		
The level of interaction between participants in online classes is low.	0,499		
Total Variance Explained= 64,192			
Cronbach α= 0,951			
KMO= 0,931			
Bartlett's Test of Sphericity			
Chi-Square= 3811,362			
df= 351			
p= 0,000<0,05			

Kaiser's eigenvalue rule was used to determine the number of factors in EFA. "Principal Components" technique was applied as the factorization method and the Direct Oblimin method was used to create the factor structure. To show an item in a factor, the rule that the factor load should be at least equal to or greater than ± 0.40 is taken into consideration (Tabachnick et al., 2011: 654). As a result of the analyzes performed to create the factor structure, items that load more than one factor at the same time and whose factor load values in more than one dimension are closer to each other than 0.10 were excluded from the analysis (Hair, 2005: 125). In the scale with 35 statements at the beginning, nine statements were excluded from the scale because they w A scale consisting of 26 items and four factors was obtained. The total variance explained is 64.192. The Cronbach Alpha value of the scale is 0.951. Cronbach Alpha values of each factor in

the scale is greater than 0.70. ere below the total correlation of items (Comrey, 1988; Şencan, 2005: 408; Kozak, 2014: 151).

Findings Regarding the Effect of Student-Student Interaction, Instructor-Student Interaction and Student-Content Interaction on Online Education Satisfaction Level

In determining whether the model created within the scope of the research is suitable for regression analysis, it was examined whether there is a multi-collinearity. In this context, it was examined with the help of correlation analysis whether there was a multiple connection problem. According to this; it was observed that the correlation coefficients of the independent variables varied between 0.390 and 0.769, and it was understood that there is no multicollinearity problem for regression analysis. In addition, the tolerance values higher than 0.10 and VIF values lower than 10 indicate that there is not multi-collinearity between the independent variables.

Table 3 includes the findings of the model created to examine the relationship between the independent variables of *student-content interaction, instructor-student interaction, and student-student interaction on satisfaction*. The regression model in question was found to be significant at the level of $p < 0.05$ with 163.883 F coefficient as a whole. When Table 3 is analyzed, the Adapted R^2 value, which is the specificity coefficient of the model calculated as 0.702. The Adapted R^2 value representing the coefficient of determination of the model indicates that the independent variables can explain approximately 70% of the change on the dependent variable. The Beta value indicates which of the independent variables in the model are more effective on the dependent variable. According to this; one unit increase in the *student-content interaction* factor causes an increase of 0.546, *instructor-student interaction* causes an increase of 0.186 and *student-student interaction* causes an increase of 0.297.

Table 3. Multiple Regression Analysis Findings Regarding the Satisfaction Factor as the Dependent Variable

Independent Variables	Not standardized Coefficients		Standardized Coefficients	<i>t</i>	<i>p</i>	Tolerance	VIF
	<i>B</i>	Standard Error	Beta				
Student-Content Interaction	0,523	0,045	0,546	11,507	0,000	0,638	1,567
Instructor-Student Interaction	0,175	0,045	0,186	3,920	0,000	0,638	1,567
Student-Student Interaction	0,278	0,040	0,297	7,026	0,000	0,807	1,239
	R= 0,841	R²= 0,707	Adjusted R²= 0,702	F= 163,883	p= 0,000		

The findings of the hypotheses established by analyzing the causal relationships predicted in line with the purpose of the study are shown in Table 4. H₁, H₂, and H₃ hypotheses are accepted.

Table 4. Acceptance and Rejection Status of Hypotheses

Hypotheses	Accepted	Decline
H ₁ : Student-content interaction affects online education satisfaction level.	√	
H ₂ : Instructor-student interaction affects online education satisfaction level.	√	
H ₃ : Student-student interaction affects online education satisfaction level.	√	

Conclusion

This aim of this research to determine the factors that affect the online education satisfaction level. In this context, four-dimensional online education satisfaction level factors were formed in the

study. These factors are *online education satisfaction level*, *student-student interaction*, *instructor-student interaction*, and *student-content interaction*. In this research, similar results are obtained from the literature. Instructor-student interaction, student-content interaction, and student-student interaction factors were reached in this study similarly as in the researches of Kuo et al. (2014) and Cole et al. (2014). These results are an indication of the need to focus on student-content interaction, instructor-student interaction, and student-student interaction in the online education process.

In the research, multiple linear regression analysis was applied to determine the effect of student-content interaction, instructor-student interaction, and student-student interaction factors on online education satisfaction. In this context, the effect of the factors representing the independent variables on the dependent variable has been revealed. Accordingly, it was concluded that student-content interaction, instructor-student interaction, and student-student interaction independent variables were effective on the level of online education satisfaction. In this context, student-content interaction, instructor-student interaction, and student-student interaction resulted in a similar way to the study of Kuo et al. (2014), Battalio (2007), Bolliger and Martindale (2004), and Thurmond (2003). Therefore, the importance of dwelling on these factors in the areas where online education is carried out becomes evident. The results of this study show that there is a need to develop applications in this direction in the online education process comes to the fore.

The research contributes to the literature by determining the relationship between student-content interaction, instructor-student interaction, student-student interaction and online education satisfaction. The strongest relationship observed between online satisfaction level is student-content interaction. In addition, it has been revealed that instructors in online education should take these results into account.

The second important relationship in the study was found to be student-student interaction. This shows that the interaction between students during the online course affects their satisfaction level. In this case, the instructor plays an important role in encouraging students to attend classes. Because in online education, students cannot be together physically and after a certain point, the student's interest in the lesson may decrease. Therefore, it can be difficult to focus on the course and communicate with others. Accordingly, it is necessary to create materials that will attract students' attention to the lesson and increase their interaction.

Generally, the evaluations and the suggestions made in line with the findings of the research are valid within the scope of this research. In addition, obtaining data through online platforms raises the problem of the validity of the research. In addition, the research was carried out by considering the participants who participated in the research as potentially the people who received online education. However, it is not known exactly whether the participants received online training or not. In future studies, data can be collected face-to-face in larger and different samples. In addition, studies can be carried out using different research techniques for each of the factors that have an impact on online education satisfaction. Thus, more general and valid results regarding online education satisfaction can be presented.

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