

**THE ROLE OF STUDENT SATISFACTION IN THE IMPACT OF E-LEARNING SERVICE  
QUALITY ON STUDENT LOYALTY AND CORPORATE REPUTATION****Asst. Prof. (Ph.D.) Metin BAYRAM\*** **Ph.D. Selman HIZAL\*\*** **Prof. (Ph.D.) Ahmet ZENGİN\*\*\*** **ABSTRACT**

*In the service quality literature, although the relationships between customer satisfaction, customer loyalty, and service quality have been widely demonstrated, there are limited empirical studies examining the relationships between these three structures together with the corporate reputation, which is the most valuable intangible asset for a business to have a sustainable competitive advantage. This study investigates the relationships between e-learning service quality, student satisfaction, corporate reputation, and student loyalty in a higher education institution. A structural equation model compatible with the literature was established to find an answer to the research problem. Findings show a direct and significant relationship among student satisfaction and distance education service quality and among student loyalty, student satisfaction, and corporate reputation. Student satisfaction has been found to resolve the correlation among distance education service quality, student loyalty, and corporate reputation. As a result, higher education institutions providing distance education services that want to increase student loyalty and corporate reputation should focus on studies that will increase student satisfaction.*

**JEL Codes:** I23, L15, L84, L86.**Keywords:** Distance Education Service Quality, Corporate Reputation, Student Satisfaction, And Student Loyalty.

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**Makale Geçmiři/Article History**

Bařvuru Tarihi / Date of Application : 18 Haziran / June 2022

Düzeltilme Tarihi / Revision Date : 25 Temmuz / July 2022

Kabul Tarihi / Acceptance Date : 10 Eylül / September 2022

**Arařtırma Makalesi/Research Article**

## **E-ÖĞRENME HİZMET KALİTESİNİN ÖĞRENCİ BAĞLILIĞI VE KURUMSAL İTİBAR ÜZERİNDEKİ ETKİSİNDE ÖĞRENCİ MEMNUNİYETİNİN ROLÜ**

### **ÖZET**

*Hizmet kalitesi literatüründe; hizmet kalitesi, müşteri memnuniyeti ve müşteri sadakati arasındaki ilişkiler yaygın olarak ortaya konulmuş olmakla birlikte bir işletmenin sürdürülebilir bir rekabet avantajına sahip olması için en değerli maddi olmayan varlığı olan kurumsal itibarı ile bu üç yapı arasındaki ilişkileri bir arada inceleyen sınırlı ampirik çalışma bulunmaktadır. Bu çalışmada bir yükseköğretim kurumundaki e-öğrenme hizmet kalitesi, öğrenci memnuniyeti, kurumsal itibar ve öğrenci bağlılığı arasındaki ilişkiler araştırılmaktadır. Araştırmanın problemine yanıt aramak üzere literatürle uyumlu bir yapısal eşitlik modeli kurulmuştur. Bulgular uzaktan eğitim hizmet kalitesi ile öğrenci memnuniyeti; öğrenci memnuniyeti ile öğrenci bağlılığı ve öğrenci memnuniyeti ile kurumsal itibar arasında doğrudan anlamlı güçlü bir ilişki olduğunu göstermektedir. Uzaktan eğitim hizmet kalitesi ile öğrenci bağlılığı ve kurumsal itibar arasındaki ilişkide ise öğrenci memnuniyetinin aracı rol oynadığı bulunmuştur. Sonuç olarak öğrenci bağlılığı ve kurumsal itibarını artırmak isteyen uzaktan eğitim hizmeti veren yükseköğretim kurumları öğrenci memnuniyetini artıracak çalışmalara odaklanmalıdır.*

**JEL Kodları:** I23, L15, L84, L86.

**Anahtar Kelimeler:** Uzaktan Eğitim Hizmet Kalitesi, Kurumsal İtibar, Öğrenci Memnuniyeti ve Bağlılığı.

### **1. INTRODUCTION**

E-services are a specific kind of service that differs from traditional services in terms of pricing structure, the quick creation of new services, the availability of transparent service feedback, the extent to which services are outsourced, and ongoing service improvement (Riedl et al., 2009; Saric & Mikolasik, 2021). Different companies and organizations that want to increase their competitive advantage and customer loyalty by providing a better and extraordinary service than their competitors focus on improving the quality of e-services (Özer, 2011).

To remain competitive, enrich and ensure the satisfaction of their students (who are their customers), the quality of educational services plays an undeniably important role for higher education (HE) institutions. There are two dimensions for higher education institutes: academic quality and services. Academic quality focuses on the learning outcome, i.e., acquiring knowledge and skills in subject areas. Service quality, on the other hand, generally focuses on business services. Aspects of the service quality dimension include both physical and non-physical elements. As the concept of service quality is abstract, it is not easily understandable. It focuses on measurable characteristics such as

facilities, physical environment, and assets while measuring the service quality in higher education institutions (Saleem et al. 2017: 237-238).

An E-learning system is a type of distance education where instructional services are offered through a web-based platform (Çelik and Perçin, 2020). As the Internet becomes more widespread and the Internet of Things continues to develop, universities focus on internet-based services for HE (e.g., e-learning). Because of the popularity and availability of the internet, Internet-based teaching platforms significantly impact higher education. Additionally, the growth of Internet-based education is significant. E-learning is a formal learning approach in which instructors and students interact remotely through Internet (web)-based technologies (e-infrastructure) (Pham, Williamson, & Berry, 2018).

Service quality, customer satisfaction, and customer loyalty are distinct but related concepts. The relationship between service quality, customer satisfaction, customer loyalty, and behavioral intentions has been the subject of numerous studies by many authors (Yarimoğlu, 2015). Research (e.g., Cronin & Taylor, 1992; Aksoy et al., 2003; Park et al., 2004; Ngo & Nguyen, 2016: 106; Sevgi, 2017; Kerse, 2021) shows that the quality of the company increases customer satisfaction. The increased customer satisfaction ensures the continuity of the company's existence by increasing customer loyalty as well as the company's profits. In literature by (Chang et al., 2009; Sevim, 2018), authors have shown that e-service quality positively affects customer satisfaction, and customer satisfaction positively affects loyalty. Therefore, customer satisfaction depends on both traditional and e-service quality levels. Depending on customer satisfaction, customer loyalty changes in the direction of increase or decrease.

Numerous studies have been conducted in Turkey and worldwide on the relationship between service quality, student satisfaction, and loyalty in higher education institutions. In addition, studies have investigated the structural relationships between student satisfaction, service quality, student loyalty, and corporate reputation in institutions where traditional HE services are provided. On the other hand, many studies examine the relations between customer satisfaction, e-service quality, and customer loyalty in the e-service sector. Few empirical studies examine the relationships between these three structures and corporate reputation, especially in higher education institutions that offer e-learning services.

The purpose of this study is to make the following contributions to the literature on the quality of electronic services and higher education institutions that provide distance education services:

- (1) To examine the relationships between e-learning service quality, student satisfaction, student loyalty, and corporate reputation by using a structural equation model,
- (2) To show whether the quality of e-learning services and student satisfaction at universities providing e-learning services are more likely to influence corporate reputation or student loyalty,

(3) To show which factors should be prioritized by higher education institutions (HEIs) seeking to enhance their corporate reputation and student loyalty,

(4) To show the mediating effect of student satisfaction in the relationships between e-service quality, student loyalty, and corporate reputation.

This paper developed a research model to show the causal relationships between e-learning service quality, student satisfaction, student loyalty, and corporate reputation. To test the developed model, data were collected from the students who completed the traffic safety course at Sakarya University (one of the leading universities in Turkey for distance education) using an online questionnaire. Data were tested using Exploratory Factor Analysis (EFA) and Confirmatory Factor Analysis (CFA). All relationships among the constructs that make up the model were statistically significant. In other words, all five hypotheses developed from the literature were supported by the EFA and CFA analyses. Notably, in ensuring the continuation of education during the period of COVID19 when a complete lockdown is experienced, the role of distance education as a rescuer makes the findings obtained from this research, and it becomes more meaningful.

## **2. LITERATURE AND HYPOTHESIS**

### **2.1. E-Learning Service Quality**

Çelik and Perçin (2020) define e-learning as “a distance learning method in which teaching services are offered to educators, students, and other users through a web-based system. Recently, with the trigger of the COVID19 pandemic, e-learning systems have started to be used more widely by all educational institutions, significantly higher education institutions. Due to the advantages of distance education, such as eliminating time and space restrictions, institutions have become competitive with each other due to the increase in demand.

An assessment of the total excellence or superiority of the service is known as service quality. Higher education can be considered a unique service for students to succeed in the future. Service quality in a university environment refers to students' expectations and perceptions of various services offered by the university (Qazi et al., 2021).

The literature research for this study shows that there are studies to measure the service quality of the HEs in the conventional classrooms. Stodnick & Rogers (2008) used a scale consisting of 5 dimensions and 18 items by changing the SERVQUAL scale to measure the educational service quality of a higher education institution. Dado et al. (2011) also used the SERVQUAL scale to assess the quality of HE services quality in Serbia. Udo et al. (2011) used the SERVQUAL scale, which consists of empathy, trust, reliability, responsiveness, and site content dimensions, to assess the service quality of e-learning.

Some recent efforts are observed to improve e-learning service quality levels (For example, Bayram, Zengin and Sert, 2021; Dursun et al., 2014); Machado Da Silva et al., 2014; Martinez-Arguelles et al., 2013). Martinez- Arguelles et al. (2013) measured e-learning service quality in four dimensions: core activity (teaching), auxiliary or administrative services, support services, and user interface. Dursun et al. (2014) used the SERVQUAL scale to measure the quality of distance education. Bayram, Zengin, and Sert (2021) measured the distance education service quality of a higher education institution in Turkey, which continues higher education in the form of distance education during the COVID19 pandemic; it measured trainer performance (functional quality) and e-information quality (technical quality) scales, which adapted from the Grönross's dimensions of functional quality and technical quality.

## **2.2. Student Satisfaction**

Satisfaction with students is a short-term attitude from evaluating their experience with the educational service received (Öztürk, 2019). Eygü and Karaman (2013) describe a student's satisfaction with a course or an educational institution; they evaluate it as a "comparison of the knowledge gained by the student with the learning outcomes of the course, the adequacy, and suitability of technology and the support given to the student."

Student satisfaction can be characterized as a mindset that results from assessing educational experiences or contrasting this perspective with the university's experience and expectations (Qazi et al., 2021). Students' satisfaction is affected by students' expectations and perceptions about the services and the quality of the services provided (Saleem et al., 2017). The degree of satisfaction drops if there is a negative distinction between the actual service performance and experience and increases if there is a positive difference (Qazi et al., 2021).

Jensen and Artz (2005); Stodnick and Rogers (2018), examining the relationship between the quality of education service provided in the traditional classroom environment and student satisfaction, have shown a positive relationship. Similarly, Helgesen and Nasset (2007a) and Hwang & Choi (2019), who researched university college students, found that the quality of education service directly affects student satisfaction. Pham, Williamson & Berry (2018), investigating e-learning perceptions of higher education students, concluded that e-learning service quality positively impacts students' satisfaction.

In this respect.

Hypothesis 1: Service quality for e-learning directly and positively affects the satisfaction of the students.

### **2.3. Student Loyalty**

Student loyalty differs from the concept of customer loyalty. While the idea of satisfaction in customer loyalty is related to the customer who directly benefits from the product or service; In student loyalty, it includes not only the students who directly benefit from the education service but also the behavioral components and the attitudes that occur with the influence of all the stakeholders affected by the education service (Korumaz & Tekel, 2017).

Student loyalty is “the student's commitment to her/his university and the service she/he provides” (Köse, 2012). Student loyalty has a significant impact on ensuring the permanent preference of educational institutions. In this context, educational institutions must ensure student loyalty (Korumaz & Tekel, 2017).

Student loyalty is not limited to the period during which students are officially registered. The loyalty of former students can also be essential to an educational institution (Helgesen and Nettet, 2007a). For this reason, student loyalty can be associated with the period in which the student is registered and after the student completes formal education in the institution. One of the primary goals inherently of a higher education institution is to have students who are committed to the institution despite situational influences (Helgesen and Nettet, 2007a; Schlesinger, Cervera & Pérez-Cabañero, 2017). Satisfied students produce optimistic views about the institution and recommend the same institution to other students (Saleem et al., 2017).

Customer loyalty is often perceived as the main result of customer satisfaction. Researchers have also found that student satisfaction positively affects student loyalty (Helgesen & Nettet, 2007b). Students, who are customers of higher education institutions, will remain loyal to their institutions if they are satisfied with the education service they receive. High-satisfaction graduates give back in both tangible and intangible ways, recommend the university to others, and spread optimistic thoughts (Qazi et al., 2021).

Gedik and Üstüner (2017), who conducted a meta-analysis by examining eleven studies on the employees of educational organizations in Turkey, found that organizational commitment and job satisfaction affect each other positively. In this study, it is stated that Meador (2001), Naumann (1993), and Shin and Reyes (1995) reached similar findings. Thomas (2011), Helgesen and Nettet (2007b), and Qazi et al. (2021) found that student satisfaction directly affects student loyalty. Pham, Williamson & Berry (2018), investigating e-learning perceptions of higher education students, concluded that satisfaction with e-learning positively affects students' e-loyalty.

In this respect.

Hypothesis 2: Student satisfaction directly and positively affects student loyalty.

## **2.4. Corporate Reputation**

While reputation is considered the most valuable intangible asset for a company to sustain its competitive advantage (Song, Ruan & Park, 2019), high respect by critical stakeholders is seen as a vital element of an organization's success in a highly competitive environment (Burlea- Schiopoiu & Balan, 2021). The integrated representation of a university's internal and external elements is called that university's reputation (Saleem, 2017).

Numerous researchers have stated and acknowledged the importance of university reputation. Students mostly choose universities based on their perceptions of the university's reputation. Students mostly perceive reputation both horizontally and vertically. The horizontal reputation context compares institutions based on specific characteristics and dimensions a student would love to discuss. The vertical reputation context concerns the student's perception of positive or negative feelings about institutions (Saleem, 2017).

Corporate reputation, which reflects how satisfied the public is that companies meet their expectations from their products and services, is considered one of the results of high customer satisfaction in the long run and a reliable indicator of whether their customers are satisfied or not (Saeidi et al. 2015). Many authors have proved the positive effect of customer satisfaction on corporate reputation (e.g., Davies et al., 2003; Galbreath & Shum, 2012; Kim & Kim, 2017; Saeidi et al., 2015; Walsh et al., 2009).

Satisfaction is one of the most important driving forces of corporate reputation in higher education institutions. Satisfaction with students is a short-term attitude that emerges from evaluating student experiences regarding the educational service received (Rashid & Mustafa, 2020). Overall, satisfaction is positively and significantly associated with an institutional reputation in schools or the context of higher education institutions (Navarro et al., 2005; Helgesen & Nettet, 2007b; Skallerud, 2011; Badri & Mohaidat, 2014; Rashid & Mustafa, 2020).

In this respect.

Hypothesis 3: Student satisfaction directly and positively affects corporate reputation.

## **2.5. The Intervening Role of Student Satisfaction in the Correlation Between Student Loyalty and E-Learning Service Quality**

In the literature, the relationships between customer satisfaction, customer loyalty, and service quality are based on two basic approaches (Izogo and Ogba, 2015). Cronin and Taylor (1992), Boulding et al. (1993), Headley and Miller (1993), and Zeithaml et al. (1996) suggest that there is a direct relationship between service quality and customer loyalty, but Caruna et al. (2000), Dhandabani (2010), and Ilias and Panagiotis (2010) have shown that customer satisfaction plays a mediating role between

service quality and customer loyalty. Therefore, it can be said that service quality directly or indirectly affects customer satisfaction, which strongly affects customer behavior and loyalty directly or indirectly (Yarimoğlu, 2015).

Caruna et al. (2000), Dhandabani (2010), and Ilias and Panagiotis (2010) have revealed that customer satisfaction plays a mediating role between service quality and customer loyalty. In the e-service quality literature, it has been shown by some authors (for example, Chang et al., 2009; Sevim, 2018) that e-service quality has a positive effect on satisfaction and that satisfaction has a positive impact on loyalty. Parasuraman, Zeithaml and Malhotra (2005), İter (2009), Yıldız and Çizel (2017), and Faiz (2018) found that e-service quality affects customer satisfaction and customer loyalty positively.

Helgesen and Nettet (2007a), who conducted a case study on the students of a Norwegian University College, empirically proved that the quality of education service positively affects student satisfaction and student satisfaction positively affects student loyalty. Dehghan et al. (2013), Hassan & Shamsudin (2019), Öztürk (2019), Gazi et al. (2021), Phonthanakitithaworn et al. (2022), and Teeroovengadum et al. (2019). The model was designed by following the way of university teaching quality, student satisfaction, and student loyalty and found that university teaching quality directly affects student satisfaction and student satisfaction directly affects student loyalty. Pham, Williamson & Berry (2018) reached results consistent with the literature knowledge in their studies investigating the e-learning service quality, e-satisfaction, and e-loyalty perceptions of higher education students. More specifically, he concluded that there is a positive relationship between e-learning service quality and e-satisfaction and between e-satisfaction and e-loyalty.

In this respect.

Hypothesis 4: E-Learning service quality indirectly affects student loyalty and positively on student satisfaction.

## **2.6. The Mediating Role of Student Satisfaction in the Relationship Between E-Learning Service Quality and Corporate Reputation**

Keeping promises, being reliable, having various products and services, and respecting consumer rights increase an institution's reputation. Although many features have the most impact on the increase of corporate reputation, they satisfy their customers with product and service quality (Taşdelen and Taşlı, 2019). Delivering the promised quality is essential to building a positive reputation (Song, Ruan, & Park, 2019).

Studies conducted in different service sectors have proven that customer satisfaction and product quality affect corporate reputation (Wang, Lo & Hui, 2003; Park, Robertson & Wu, 2004; Saeidi et al., 2015; Song, Ruan, & Park, 2019). Park, Robertson, and Wu (2004), who studied air transport, revealed that service quality and customer satisfaction could affect corporate reputation. Again, in the same

service sector, Song, Ruan & Park (2019) found that the responsiveness and reliability sub-dimensions of service quality significantly affect corporate reputation through the corporate image. Wang, Lo & Hui's (2003) research on the banking sector revealed that service quality positively affects bank reputation. Özkan et al. (2020) showed that service quality and customer satisfaction affect corporate reputation over perceived value in the same service sector. Jinfeng et al. (2014) revealed that the quality factor positively affects corporate reputation. Researching companies operating in industrial manufacturing and consumer products, Saeidi et al. (2015) empirically proved that customer satisfaction positively affects reputation.

Universities need to concentrate on service quality in order to establish a good name and increase student satisfaction in a competitive environment (Qazi et al., 2021). In this respect, service quality, which significantly impacts the university's reputation, is essential in attracting quality students to the university (Daniel et al., 2017; Panda et al., 2019). Dehghan et al. (2013), Bakrie et al. (2019), and Qazi et al. (2021) showed that university service quality impacts both university reputation and student satisfaction. Unlike the structural path followed in our study, Qazi et al. (2021) designed the model by following the way of university service quality, corporate reputation, and student satisfaction, but they concluded that corporate reputation does not affect student satisfaction.

In this respect.

Hypothesis 5: E-Learning service quality indirectly positively affects corporate reputation on student satisfaction.

### **3. MODEL DESIGN**

In the service quality literature, the relationships between service quality, customer satisfaction, and customer loyalty have inspired many studies in the service sector. Limited empirical studies examine the relationships between these three structures and corporate reputation.

Few studies examine the relationships between the four constructs in traditional higher education service quality. Helgesen and Nettet (2007a) investigated the mediating role of student satisfaction and corporate image in the relationship between service quality and student loyalty. Saleem et al. (2017) focused on the mediating part of university reputation in the relationship between service quality and student satisfaction. Moslehpour et al. (2020) showed that the satisfaction of the student has a mediating position in the relationship between corporate reputation and service quality. Qazi et al. (2021) revealed that university service quality affects university reputation, university reputation affects student satisfaction, and student satisfaction affects student commitment.

Studying the perceptions of students in higher education institutions providing e-learning services, Pham et al. (2018) investigated the relationships between e-learning service quality, e-

satisfaction, and e-loyalty. As far as is known, the mediating effect of student satisfaction on the relationship between higher education service quality (e-learning service quality) and corporate reputation, which provides both traditional and e-learning services, has not been examined. To meet this requirement in the literature, the research model illustrated in Figure 1 was developed to examine the role of student satisfaction in the effect of e-learning service quality on student loyalty and corporate reputation.

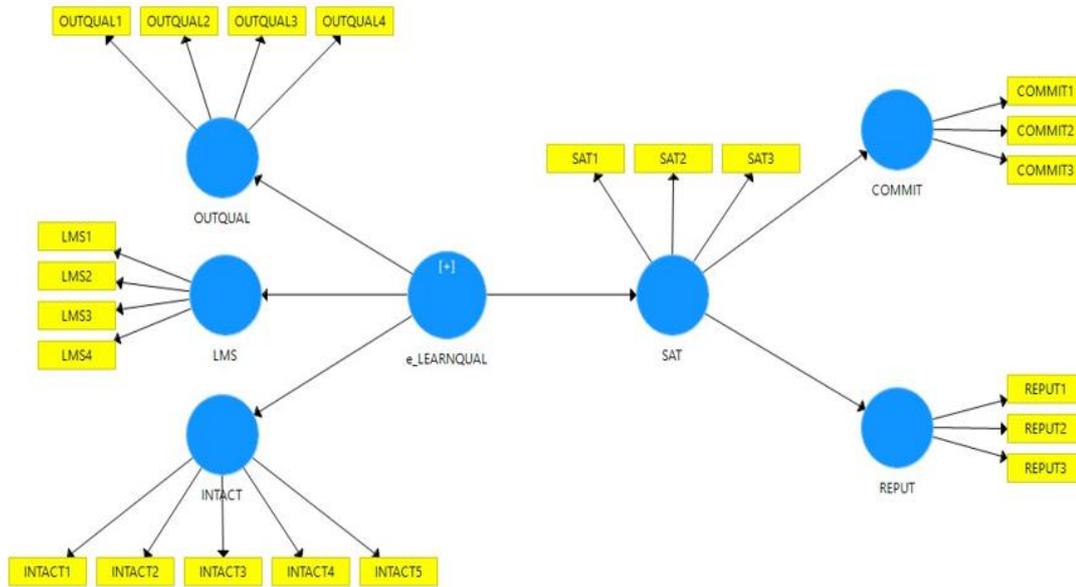
In this study, the input sources of the model design are as follows:

(a) Studies examining and revealing the relationships between these four structures separately under the previous title of “Literature Research and Hypothesis Development,”

(b) Studies revealing the relations between service quality, customer satisfaction, corporate reputation, and customer loyalty in traditional higher education service quality (Dehghan et al., 2013; Helgesen and Nettet, 2007b; Saleem et al., 2017; Moslehpour et al., 2020; Qazi et al., 2021),

Pham et al. (2018) investigated students’ perceptions of the relationships between e-learning service quality, e-satisfaction, and e-loyalty in higher education institutions providing e-learning services.

**Figure 1. Research Model**



## 4. MATERIAL & METHOD

### 4.1. Research Population, Sampling, and Data Collection

The research was carried out on undergraduate students who took the Traffic Safety course, which is taught as an elective course at Sakarya University in the Fall and Spring semester of 2021-2022, in the form of distance education. The convenience sampling method was used as the sampling method. The data required for the research were collected from 261 students using the online survey technique.

The number of expressions used in the research is twenty-two. In multivariate analysis studies, the sample size is required to be at least ten times the number of expressions (Büyüköztürk et al., 2012). Therefore, a sample size of 220 is sufficient for a multivariate analysis consisting of twenty-two expressions. However, it is recommended to increase the sample size to minimize the estimation errors (Sönmez Çakır, 2020). In addition, Hair et al. (2014) claim that accurate results can be achieved even in small sample sizes in analysis with the PLS-SEM method. Therefore, the data set consisting of 261 students is sufficient.

While the total number of participants was 261, 162 (62.1%) of the students were women, 237 (90.8%) were between the ages of 19-24, and 166 (63.6%) were 4<sup>th</sup>-grade students. According to the faculties, 81 (31.1%) students were in the Faculty of Political Sciences, 58 (22.2%) students were in the Faculty of Science and Literature, and 43 (16.5%) students were in the Faculty of Business Administration. 79 students (30.2 percent) from other faculties participated in the research (Table 1).

**Table 1. Demographic Findings**

<b>Characteristic</b>	<b>Frequency</b>	<b>Ratio (%)</b>
<b>Gender</b>	<b>261</b>	<b>100.0</b>
Male	99	37.9
Female	162	62.1
<b>Age</b>	<b>261</b>	<b>100.0</b>
18 and under	1	0,4
19-24	149	57,1
25-34	11	4,2
34 and above	1	0,4
<b>Grade</b>	<b>261</b>	<b>100.0</b>
2nd Grade	42	16,1
3rd Grade	53	20,3
4th Grade	166	63,6
<b>Faculty</b>	<b>261</b>	<b>100.0</b>
Faculty of Computer and Information Sciences	10	3,8
Faculty of Dentistry	11	4,2
Faculty of Arts and Sciences	58	22,2
Faculty of Law	2	0,8
Faculty of Theology	10	3,8
Faculty of Communication	7	2,7
Faculty of Business Administration	43	16,5
Faculty of Engineering	15	5,7
Faculty of Health Sciences	13	5,0
Faculty of Art, Design, and Architecture	5	1,9
Faculty of Political Sciences	81	31,0
Other	6	2,3

## 4.2. Scales of Research

To measure the e-learning service quality, which was designed as a second-order scale, the sub-dimensions of output quality, learning management system, and interaction quality, whose validity and reliability was proven in a study by Bayram, Hızal & Zengin (2022), were used. The student satisfaction scale was adapted from Saltürk & Güngör (2020), the student loyalty scale was adapted from Sarstedt, Ringle & Hair (2021), and the corporate reputation scale was adapted from Dehghan (2013) and Sarstedt, Ringle & Hair (2021) (Table 2). Participants were asked to respond to the expressions related to the dimensions with a 5-point Likert scale: “1=Strongly Disagree”, ..., “5=Strongly Agree”.

**Table 2. Dimensions and Expressions of the Research**

Code	Statement
<b>INTACT</b>	<b>Distance Education Interaction Quality (Bayram, Hızal &amp; Zengin, 2022)</b>
INTACT1	University takes care of students.
INTACT2	Faculty members of my university are knowledgeable in their fields.
INTACT3	Faculty members of my university respond quickly and efficiently to student needs.
INTACT4	Faculty members of my university enter the classes very well prepared.
INTACT5	Faculty members of my university provide an environment that encourages interactive participation.
<b>LMS</b>	<b>Distance Education Management System Quality (Bayram, Hızal &amp; Zengin, 2022)</b>
LMS1	SABIS provides valuable and helpful information.
LMS2	SABIS provides accurate information and content.
LMS3	SABIS is visually appealing.
LMS4	SABIS is user-friendly (it can be used without special training).
<b>OUTQUAL</b>	<b>Distance Education Output Quality (Bayram, Hızal &amp; Zengin, 2022)</b>
OUTQUAL1	It was enough to measure our knowledge.
OUTQUAL2	It has contributed to my academic development.
OUTQUAL3	It offered different learning opportunities.
OUTQUAL4	It was sufficient in terms of subject and scope.
<b>SAT</b>	<b>Student Satisfaction (Saltürk &amp; Güngör, 2020)</b>
SAT1	I am satisfied with its contribution to my academic development.
SAT2	I am satisfied with the different learning opportunities.
SAT3	I am generally satisfied with the university's distance education during the pandemic.
<b>COMMIT</b>	<b>Student Loyalty (Sarstedt, Ringle &amp; Hair, 2021)</b>
COMMIT1	I would tell my family and friends about the university.
COMMIT2	Sakarya University would be my first choice if I were to make a decision again.
COMMIT3	I will prefer Sakarya University for my future education.
<b>REPUT</b>	<b>Corporate Reputation (Dehghan, 2013; Sarsted et al., 2021)</b>
REPUT1	Sakarya University has a good reputation in distance education.
REPUT2	Sakarya University has a good reputation.
REPUT3	Sakarya University's distance education system is appreciated.

## 4.3. Data Analysis

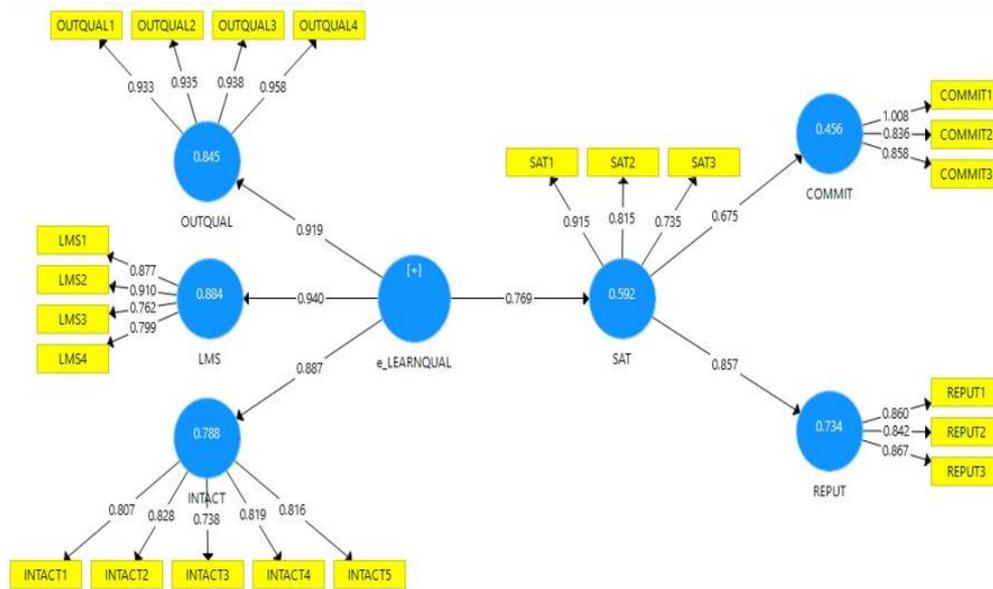
The designed structural equation model (SEM) was tested with the Partial Least Squares – Structural Equation Model (PLS-SEM) method via Smart PLS software version 3.3.7. In the data analysis, three different algorithms were run: Consistent PLS algorithm, Consistent PLS bootstrapping algorithm and Blindfolding algorithm.

## 5. RESULTS

### 5.1. Estimation of PLS\_SEM Model

The Consistent PLS algorithm was applied in SmartPLS version 3.3.7 software for model estimation. PLS Algorithm results are given in Figure 2. The numbers displayed inside the latent variables depicted as circles represent the  $R^2$  values, and the numbers on the path connecting the latent variables represent the path coefficients ( $\beta$ ). It was found that the 59.2% variance of SAT ( $R^2=0.592$ ) was explained by e\_LEARNQUAL, the 45.6% variance of COMMIT ( $R^2=0.456$ ) explained by SAT, and the 73.4% variance of REPUT ( $R^2=0.734$ ) explained by SAT. The effect of the path from e\_LEARNQUAL to SAT is (e\_LEARNQUAL  $\rightarrow$  SAT) 0.769, the effect of the path from SAT to COMMIT is (SAT  $\rightarrow$  COMMIT) 0.675, and the effect of the path from SAT to REPUT is (SAT  $\rightarrow$  REPUT) 0.857.

**Figure 2. PLS Algorithm Results**



### 5.2. Evaluation of the Measurement Model

The measurement model's convergent validity, internal consistency, reliability, and discriminant validity are analyzed. The analysis results and evaluation criteria related to convergent validity and internal consistency reliability are given in Table 3. To ensure convergent validity, all indicator loads should be above 0.700, the indicator reliability should be above 0.500, and AVE should be above 0.500 (Sarstedt et al., 2021). As a result of the analysis, indicator loads were found between 0.735 and 1.008, indicator reliability between 0.541 and 1.016, and AVE values between 0.644 and 0.886, which are above the expected threshold value (Table 3). Therefore, the convergent validity of the model was found to be satisfactory. To ensure internal consistency reliability, the Cronbach's alpha of the latent

variables should be above 0.700, the rho\_A coefficient should be above 0.700, and the Composite Reliability (CR) values should be above 0.700 (Sarstedt et al., 2021). As a result of the analysis, Cronbach's alpha values were found between 0.858 and 0.969, rho\_A coefficients between 0.873 and 0.969, and CR values between 0.864 and 0.969 (Table 3). Therefore, the internal consistency reliability of the model was found to be satisfactory.

**Table 3. Test of Convergent Validity and Internal Consistency Reliability**

Dimension	Statement	Convergent validity			Internal consistency reliability		
		Indicator loadings	Indicator reliability	AVE	Cronbach's alpha	rho_A	CR
		> 0.700	> 0.500	> 0.500	> 0.700	> 0.700	> 0.700
COMMIT	COMMIT1	1.008	1.016	0.817	0.930	0.939	0.930
	COMMIT2	0.836	0.699				
	COMMIT3	0.858	0.735				
INTACT	INTACT1	0.807	0.651	0.644	0.900	0.901	0.900
	INTACT2	0.828	0.686				
	INTACT3	0.738	0.545				
	INTACT4	0.819	0.671				
	INTACT5	0.816	0.665				
LMS	LMS1	0.877	0.769	0.704	0.902	0.909	0.905
	LMS2	0.910	0.828				
	LMS3	0.762	0.581				
	LMS4	0.799	0.639				
OUTQUAL	OUTQUAL1	0.933	0.871	0.886	0.969	0.969	0.969
	OUTQUAL2	0.935	0.873				
	OUTQUAL3	0.938	0.881				
	OUTQUAL4	0.958	0.917				
REPUT	REPUT1	0.860	0.740	0.734	0.892	0.892	0.892
	REPUT2	0.842	0.709				
	REPUT3	0.867	0.752				
SAT	SAT1	0.915	0.837	0.681	0.858	0.873	0.864
	SAT2	0.815	0.665				
	SAT3	0.735	0.541				

The HTMT criterion of correlations introduced by Henseler et al. (2015) was used to test the discriminant validity. According to Henseler et al. (2015), if the HTMT ratios between binary latent constructs are below 0.900, sufficient discriminant validity between constructs has been established. As can be seen in Table 4, all results are between 0.411 and 0.870. Therefore, it was found that there was a sufficient level of discriminant validity between the constructs.

**Table 4. Test of Discriminant Validity**

Dimension	COMMIT	INTACT	LMS	OUTQUAL	REPUT	SAT
COMMIT						
INTACT	0.573					
LMS	0.575	0.630				
OUTQUAL	0.411	0.578	0.730			
REPUT	0.599	0.545	0.774	0.754		
SAT	0.669	0.605	0.688	0.702	0.870	

### 5.3. Evaluation of the Structural Model

The main criteria used in the structural model evaluation are  $Q^2$  statistic,  $R^2$  values, the goodness of fit index,  $\beta$  path coefficient, and T statistic.

The  $Q^2$  statistic gives the predictive value of the latent variables. In the SmartPLS version 3, two types of  $Q^2$  statistics are estimated by performing the blindfolding procedure, namely CV-Communality and CV-Redundancy. The  $Q^2$  statistic between 0.02 and 0.14 shows a small predictive level between the variables, the  $Q^2$  statistic between 0.15 and 0.34 shows a medium predictive level, and the  $Q^2$  statistic greater than 0.35 shows a large predictive level (Sönmez Çakır, 2020). As seen in Table 5, the  $Q^2$  statistic for CV-Communality and CV-Redundancy indices of the dimensions that make up the model was found to be between 0.319 and 0.700; therefore, the structural model had great predictive validity and fit.

Besides the  $Q^2$  statistics, the model's explanatory power can be evaluated with the  $R^2$  values of the endogenous latent variables. Henseler et al. (2009) classify  $R^2$  values around 0.75 as substantial, around 0.50 as moderate, and about 0.25 as weak. As seen in Table 5 and Figure 2, the  $R^2$  values of COMMIT, REPUT, and SAT endogenous structures were found to be 0.456, 0.734, and 0.592, respectively. It was concluded that COMMIT and SAT had moderate explanatory power and REPUT had solid explanatory power.

**Table 5. The Predictive Validity and Explanatory Power of the Model**

Variables	CV-Communality	CV-Redundancy	$R^2$
	$Q^2 (=1-SSE/SSO)$	$Q^2 (=1-SSE/SSO)$	
COMMIT	0.700	0.319	0.456
REPUT	0.611	0.464	0.734
SAT	0.545	0.376	0.592

The quality of the model's goodness of fit was evaluated by looking at the Goodness of Fit index (GoF). The main criterion is that the GoF value introduced by Tenenhaus et al. (2005) is more significant than 0.36 (Wetzels et al., 2009). The mean of AVE values of latent structures was found to be 0.695, the mean of  $R^2$  values was 0.594, and the GOF index, which is the square root of the product of these two,

was calculated as 0.642. Therefore, the goodness of fit quality of the model was found to be satisfactory according to the GoF index.

The consistent bootstrapping procedure was run in SmartPLS version 3 to test the research hypotheses. Here, the statistical significance of the relations between the structures is evaluated by looking at the T statistic and the path coefficients ( $\beta$  values).

As a result of the test, strong path coefficients ( $\beta$  values) were found in the relationships between the structures in the structural model, and thus all hypotheses are supported: e\_LEARNQUAL  $\rightarrow$  SAT ( $\beta=0.698$ ,  $T=15.796$ ,  $p<0.001$ ), SAT  $\rightarrow$  COMMIT ( $\beta=0.611$ ,  $T=12.779$ ;  $p<0.001$ ), SAT  $\rightarrow$  REPUT ( $\beta=0.756$ ,  $T=19.021$ ,  $p<0.001$ ), e\_LEARNQUAL  $\rightarrow$  SAT  $\rightarrow$  COMMIT ( $\beta=0.427$ ,  $T=9.090$ ,  $p<0.001$ ), and e\_LEARNQUAL  $\rightarrow$  SAT  $\rightarrow$  REPUT ( $\beta=0.528$ ,  $T=9.526$ ,  $p<0.001$ ) (see Table 6).

**Table 6. Results of Consistent Bootstrapping**

Path	Path Coefficient ( $\beta$ )	Standard Deviation	T Statistics	P Values
e_LEARNQUAL $\rightarrow$ SAT	0.698	0.044	15.796	<0.000
SAT $\rightarrow$ COMMIT	0.611	0.048	12.779	<0.000
SAT $\rightarrow$ REPUT	0.756	0.040	19.021	<0.000
e_LEARNQUAL $\rightarrow$ SAT $\rightarrow$ COMMIT	0.427	0.047	9.090	<0.000
e_LEARNQUAL $\rightarrow$ SAT $\rightarrow$ REPUT	0.528	0.055	9.526	<0.000

## 6. CONCLUSION AND DISCUSSION

This study investigated the causal relationships between the quality of e-learning services, student satisfaction, corporate reputation, and student loyalty to a higher education institution providing e-learning services. The study focuses on the mediating role of student satisfaction in the relationship between the quality of e-learning services, student loyalty, and corporate reputation. More specifically, the question is whether the quality of e-learning services and student satisfaction of a higher education institution providing e-learning services significantly impact the corporate reputation or student loyalty. Five hypotheses developed from the literature were empirically tested through EFA and CFA analyses.

First, the quality of e-learning services was found to have a direct positive impact on student satisfaction. This result suggests that higher education institutions providing e-learning services should focus on the quality of e-learning services to increase student satisfaction. This result supports the study of Pham, Williamson & Berry (2018), which found that the quality of e-learning services positively influences student satisfaction. It is consistent with studies showing the relationship between the quality of services in traditional higher education and student satisfaction (Hwang & Choi, 2019; Jensen & Artz, 2005; Stodnick & Rogers, 2018; Helgesen & Nettet, 2007a).

Second, student satisfaction was found to impact student loyalty directly and positively. This result shows that higher education institutions that want to increase student loyalty must conduct studies to improve student satisfaction. This result supports the study of Pham, Williamson & Berry (2018), which found that higher education students' e-satisfaction positively influences e-loyalty. Studies show that students who are satisfied with higher education offerings in the traditional classroom environment are more loyal (Thomas, 2011; Helgesen & Nettet, 2007a; Qazi et al., 2021), as well as studies finding the relationship between organizational commitment and job satisfaction in educational organizations (Meador, 2001; Naumann, 1993; Shin & Reyes, 1995; Gedik & Üstüner, 2017) and Kerse (2021) showing the relationship between customer satisfaction and customer loyalty as a meta-analysis study.

Third, student satisfaction directly impacted the HEI's reputation for providing e-learning services. This result shows that higher education institutions that want to improve their reputation should conduct studies to ensure student satisfaction. This result supports Moslehpour et al. (2020), who found that higher education student satisfaction positively impacts the institution's corporate reputation. It is also consistent with the findings of studies (Navarro et al., 2005; Helgesen & Nettet, 2007b; Skallerud, 2011; Badri & Mohaidat, 2014; Rashid & Mustafa, 2020) that found a positive and significant relationship between student satisfaction and reputation in the context of educational institutions.

Fourth, an indirect relationship was found between the quality of e-learning services and student loyalty through student satisfaction. In other words, the path  $e\_LEARNQUAL \rightarrow SAT \rightarrow COMMIT$  was statistically significant. This result indicates that student satisfaction is an essential mediator between e-learning quality and student loyalty. This study confirms the findings of Pham, Williamson & Berry (2018), which show a positive relationship between e-learning service quality  $\rightarrow$  e-satisfaction,  $\rightarrow$  e-loyalty. Moreover, it is consistent with studies that have found statistically significant interactions among educational service quality  $\rightarrow$  student satisfaction,  $\rightarrow$  student loyalty in institutions providing traditional HE services (Dehghan et al., 2013; Helgesen and Nettet, 2007a; Hassan & Shamsudin, 2019; Gazi et al., 2021; Phonthanukithaworn et al., 2022; Teeroovengadum, 2019).

Fifth, an indirect relationship was found between the quality of e-learning services and the corporate reputation through student satisfaction. To the best of our knowledge, this study is the first that shows the relationship between them. However, Dehghan et al. (2013) found significant relationships between service quality  $\rightarrow$  student satisfaction,  $\rightarrow$  corporate reputation in the study conducted on master's students in the USA. The Dehghan et al. (2013) study's results are consistent with ours. Considering that the company's reputation affects student satisfaction, Qazi (2021) analyzed the path service quality of the university  $\rightarrow$  corporate reputation  $\rightarrow$  student satisfaction, but no significant relationship was found between corporate reputation  $\rightarrow$  student satisfaction.

Another important finding of this study is that student satisfaction in higher education institutions that offer e-learning services is more likely to affect the corporate reputation than student loyalty.

The study's main contribution to the literature is to demonstrate the importance of the mediating role of student satisfaction in the impact of e-learning service quality on student loyalty and corporate reputation. Secondly, it was found that the effects of student satisfaction on the corporate reputation of higher education institutions providing e-learning services are higher than student loyalty.

It is recommended that higher education institutions that want to increase their corporate reputation and student loyalty focus on the quality of educational services and student satisfaction and implement measures to improve the quality of educational services oriented to student satisfaction. Researchers are recommended to conduct similar studies using different approaches and models to measure the quality of e-learning services.

The study was conducted on a sample of students from Sakarya University during the COVID19 procedure. In this regard, similar studies conducted on students from other universities offering distance education may yield different results. Another limitation is that the survey was conducted during a period when students' psychology and motivation were negatively affected during the COVID -19 process.

#### **ETHICS DECLARATION**

The study named “The Role of Student Satisfaction in the Effect of E-Learning Service Quality on Student Loyalty and Corporate Reputation” was written in compliance with scientific ethics and the rules of attribution. No changes were made to the data set, and it was not submitted to any other academic publication medium for analysis for this study. The decision numbered "18" from the meeting of the Ethics Committee for Social Sciences and Humanities of our University on 02.02.2022 numbered 42, Inst. See. Dr. Selman HIZAL, Dr. Lecturer Member Metin BAYRAM, and Prof. Dr. Ahmet ZENGİN's applications were approved.

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Tasarım / Design	Yöntemi, ölçeği ve deseni tasarlamak / <i>Designing method, scale and pattern</i>	Asst. Prof. (Ph.D.) Metin BAYRAM Asst. Prof. (Ph.D.) Selman HIZAL Prof. (Ph.D.) Ahmet ZENGİN
Veri Toplama ve İşleme / <i>Data Collecting and Processing</i>	Verileri toplamak, düzenlenmek ve raporlamak / <i>Collecting, organizing and reporting data</i>	Asst. Prof. (Ph.D.) Metin BAYRAM Asst. Prof. (Ph.D.) Selman HIZAL Prof. (Ph.D.) Ahmet ZENGİN
Tartışma ve Yorum / <i>Discussion and Interpretation</i>	Bulguların değerlendirilmesinde ve sonuçlandırılmasında sorumluluk almak / <i>Taking responsibility in evaluating and finalizing the findings</i>	Asst. Prof. (Ph.D.) Metin BAYRAM Asst. Prof. (Ph.D.) Selman HIZAL Prof. (Ph.D.) Ahmet ZENGİN
Literatür Taraması / <i>Literature Review</i>	Çalışma için gerekli literatürü taramak / <i>Review the literature required for the study</i>	Asst. Prof. (Ph.D.) Metin BAYRAM Asst. Prof. (Ph.D.) Selman HIZAL Prof. (Ph.D.) Ahmet ZENGİN

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**Hakem Değerlendirmesi:** Dış bağımsız.

**Çıkar Çatışması:** Yazar çıkar çatışması bildirmemiştir.

**Finansal Destek:** Yazarlar bu çalışma için finansal destek almadığını beyan etmiştir.

**Teşekkür:** -

**Peer-review:** Externally peer-reviewed.

**Conflict of Interest:** The authors have no conflict of interest to declare.

**Grant Support:** The authors declared that this study has received no financial support.

**Acknowledgement:** -

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