# THE EFFECT OF SERVICE QUALITY THROUGH SATISFACTION ON LOYALTY IN HIGHER EDUCATION INSTITUTIONS

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**Abstract.** *One of the best ways for businesses to have good share in the market are required to be more quality oriented as compared to the*

*competitors. This situation is similar at certain points when we relate it to higher education institutions, which plays a pivotal role in a country development. To compete in the international arena, higher education institutions should give importance to the services of units that contribute significantly to the development of R&D infrastructure. Keeping this understanding in mind, the purpose of the current research is to look into the relationship of service quality and loyalty in higher education institutions. The study will also look into the meditating role of satisfaction between this relationship. The study is a survey research and the tool for data collection is an adopted questionnaire. A total of 281 responses received are being analysed. Results show that there exists a weak and insignificant relationship between service quality and loyalty. However, the relationship between service quality and satisfaction is strong as well as significant. Similarly, the relationship between satisfaction and loyalty is also significantly strong. This supports the mediating role of the satisfaction. The results have implications for the higher education institutions. Managers are suggested to have more attention to the issue of development of quality of education in higher education institutions.*

## Introduction

Today, in parallel with the increasing competition conditions, there are many developments in every industry branch in terms of technology and organizational structures. Rapid changes and developments in the world affect service-based applications as well as product-based application Global intense competition conditions push organizations towards great diversification in the goods and services market. There is a need of having a collective approach to diversification in services and also of increase in the number of such competitors which may promote competition in the provision of quality of services. The best approach for

in the market is to focus on quality products that are of higher quality and differentiated from competitors. The association of this point of view with educational institutions has certain similarities. In this direction, it is possible to see higher education institutions (HEIs) as service businesses, carrying out activities to improve service quality to provide better service (Bayrak, 2007). In this way, trained human resource is the backbone and is vital in the development of countries, HEIs have a different service privilege compared to other enterprises.

HEIs are those institutions that not only provide individuals with professions but also significantly shape the way of life of society (Yüksel et al., 2018). Belash et al. (2015) discussed higher education institutions within the scope of the stakeholder theory approach. The authors argue that HEIs constitute a critical component of the education quality assurance system, able to respond to the needs and aspirations of its stakeholders. Alvarez and Rodriguez (1997) suggested that higher education institutions should have a structure that focuses not only on the needs of current students but also on the needs of administrative, academic, community, employers, and graduate students (Ulewicz, 2017). On the other hand, today's universities not only produce knowledge but also ensure the functioning and continuity of the market (Devebakan et al., 2019). The main motive behind the establishment of these institutions need not be restricted to impart such education by also shoulder the responsibility of training the necessary qualified, experienced and high-performance human resources, and those services that benefit the society, and services that will enable the development of scientific research projects (Bayrak, 2007).

In higher education institutions, Scientific Research Projects (SRP) coordination units are the leading units that provide infrastructure services in the realization of scientific studies for R&D. SRP coordination units have an important role in the scientific development of countries. Therefore, higher education institutions increasingly need SRP coordination units and their activities. When we look at the previous studies on quality in higher education institutions in Turkey, it is seen that studies on students' satisfaction generally come to the fore. Yüksel et al. (2018) stated that the expectations and satisfaction of all stakeholders, as well as students, should be taken into account in here.

The role of the quality assurance system has to be recognized as a pivotal in promoting competition among higher education institutions and ensuring continuous improvement in business processes. The Higher Education Quality Boards' recent audits and studies on quality and accreditation reveal the centrality of the quality assurance system in higher education institutions (Uludağ et al., 2021). The BAP coordination units in higher education institutions constitute an important pillar of the quality assurance system. Erol and Alpaydın (2017) emphasized in their study that it is of great importance to examine whether BAP units have sufficient infrastructure for the execution and evaluation of the scientific

projects they support. Before this study, no study has examined satisfaction with service quality understanding in BAP coordination units of universities in Turkey and investigated the effect of these variables on loyalty. With this study, it is expected that the SRP coordination units, which constitute an important pillar of the development of R&D services, will make an important contribution to the development of a sustainable quality understanding. Furthermore, it is required to make a well observed contribution towards the adaptation of the HEQB quality and accreditation requirements.

In this milieu of global competition, studies are needed to determine the effect of service quality perceptions of academic staff on satisfaction and loyalty in higher education institutions in Turkey. Despite the existing international literature, studies on this relationship in higher education institutions in Turkey seem very limited. This limitation motivated the author to produce this study. Academic staff (researchers) receiving services from the BAP coordination unit in a public higher education institution participated in this study. Therefore, this study is expected to address the existence gap and to contribute to the literature by proposing a conceptual model that is based on the existing literature with the aim to address the following questions:

1) What is the level of service quality of BAP coordination units within higher education institutions?
2) Does service quality in BAP coordination units within higher education institutions affect satisfaction?
3) Does service quality through satisfaction in BAP coordination units affect researchers' loyalty?

## Literature Review

### Service Quality

Different researchers have explained the concept of service quality in different words. As a whole, it refers to that aspect of the quality which is successful in meeting customer needs, requests, and expectations (İslamoğlu et al., 2006). For Parasuraman et al. (1988) service quality is the conceptual difference between consumers' perceptions and expectations regarding the services provided by a particular business. This means that quality of service will be termed high if it exceeds the expectations. As is an abstract concept, so to quantify it, many scales have been developed. The most widely used scale in the literature is the SERVQUAL. This was developed by Parasuraman et al. (1985) over ten service quality dimensions (Tzeng and Chang, 2011). Parasuraman et al. (1988) then re-evaluated this scale consisting of ten dimensions and reduced it to five dimensions to be used in different service groups. The new SERVQUAL scale has the

dimensions of tangibility, responsiveness, reliability, assurance, and empathy (Supriyanto et al., 2021).

Keeping the centrality of the concept, it has been studied in the context of several different industries, organizations and countries (Adikaram et al., 2015). Higher education institutions provide a unique environment for the review of service quality. While most of the studies on service quality in higher education focus on the student's perspective on quality, little attention is paid to the perspective of academic and administrative staff (Khodayari & Khodayari, 2011). Sultan and Wong (2011) asserted that knowledge and past experiences are important determinants in the creation and evaluation of service quality in the context of higher education. The authors categorized service quality as academic, administrative and facility service quality. It is possible to say that the examination of service quality in higher education institutions in Turkey is a subject that is needed in the literature. To respond to this need in the literature, it is necessary to examine the quality of academic and administrative services as well as the quality of campus facilities offered to students from a holistic perspective (Akyürek, 2021). From this point of view, one of the academic and administrative services in higher education is the project units that provide support for scientific research. Project units need to make adjustments to scope, timing and budget to meet the needs and expectations of the project team. Therefore, project units need to develop a good working relationship with all stakeholders and understand their stated needs to ensure stakeholder satisfaction (Muddasar, 2016).

**Loyalty**

Loyalty, by definition, is the willingness or commitment of customers to repurchase products or services from the same brand despite various obstacles (Ismanova, 2019; Ali et al., 2016). Many researchers (e.g., Zeithaml et al., 2018) have defined customer loyalty. These authors argue that customer loyalty is an action or strategy that provides a long-term competitive advantage, as well as a way of gaining and retaining customers. Customer loyalty is a measure of continuously increasing the profitability of companies (Bakrie et al., 2019). It has also been defined as consumer behaviour toward repurchasing an organization's products and services. Customer loyalty helps consumers to purchase products or services by recommending the organization to others and increasing their sales profitability in the future (Chandra et al., 2018). If we look into this concept from higher education institutions perspective, it is that state of affairs when the students of a university recommend their respective university to others or speak positively about the environment, and if they have the chance to get enrolment again, they would prefer their old university to continue their education (Shahsavar & Sudzina, 2017). Bakrie et al. (2019) term loyalty as a key factor for success in higher education institutions.

Besides, loyalty is considered as a prerequisite for economic success in companies, has been the subject of academic discussions and many empirical studies (Ganić et al., 2018). In the past years, the concept of loyalty has been the subject of intense attention in higher education institutions (Borishade et al., 2021; Bui et al., 2022; Justin et al., 2019; Subandi & Hamid, 2021; Supriyanto et al., 2021). The extant literature is replete with empirical studies wherein the researchers have found that evaluating the concepts of service quality, stakeholder satisfaction and loyalty together is of great importance for higher education institutions.

**Satisfaction**

Customer satisfaction is a concept expressed as meeting customers' needs, wishes and expectations. Customer satisfaction in service arises as a result of meeting the expectations of the customer from the service during the delivery of the service (Özgüven, 2008). Customer satisfaction is one of the most fundamental principles of quality management. For this reason, if one wants to meet customer expectations, one must have customer-oriented approach not only in the official documents but observed and experienced at the application level. However, the management should recognize and understand customer expectations and then has to mobilize all the organizational resource to meet these expectations (Şahin & Şen, 2017). It should not be forgotten that the satisfaction of the academic and administrative staff plays a key role in the sustainable success of higher education institutions, as well as the satisfaction of the students from the university (Yüksel et al., 2018). It will not be out of place to conclude that the future of educational institutions must determine stakeholders' expectations and needs and provide a management service that can meet these.

**Service Quality and Satisfaction**

Organizations have been facing tough competitions in the quality of service to the extent of customer satisfaction. And the toughness in this race is a sufficient proof to highlight its importance. The increasing importance of service quality in organizations has inspired many researchers to develop scientific studies (Zhu & Sharp, 2022). The extant literature has many empirical evidences regarding the relationship between satisfaction and service quality. For example, Tayyar and Dilşeker (2013) through their empirical research observed that there is a positive relationship between service quality and satisfaction. Similarly, Topsakal and İplik (2013) revealed the existence of a positive relationship between quality and satisfaction. Ali et al. (2016) researched international students at Malaysian public universities and found that service quality dimensions affect student satisfaction and institutional image. Kılıçlı et al. (2019) found that there is a positive and significant relationship between the quality perceptions and satisfaction levels of

patients who benefit from dental health services in a higher education institution. This result supports the results of many studies published in the literature (Alam, 2021; Borishade et al., 2021; Razak et al., 2021). It can easily be concluded from the extant literature that high perception of service quality leads to a high level of satisfaction. This empirical study will put this hypothesis to text. The hypothesis is as under:

**H1:** There is a positive relationship between the service quality perception and satisfaction among the academic staff in higher education institutions.

**Service Quality, Satisfaction and Loyalty**

According to Zeithaml et al. (1996), businesses prefer to retain existing customers instead of acquiring new customers due to new costs that may be incurred. This situation is also valid for higher education institutions under increasing competition conditions. In terms of corporate memory, the retention of existing staff is much less costly than the acquisition of new staff. Thus, the loyalty of administrative or academic staff is one of the main goals of most educational institutions. Therefore, loyalty in higher education institutions is only possible with satisfaction (Bui et al., 2022). In addition, Supriyanto et al. (2021) argued that customer satisfaction can lead to high commitment and loyalty. Borishade et al. (2021) also stated that service quality is the most important determinant of satisfaction and as a result, loyalty emerges. Bui et al. (2022) strengthened this statement by revealing that there is a significant relationship between satisfaction and loyalty and that satisfaction has a mediating role between service quality and loyalty. Ganic et al. conducted a study at a private university in Sarajevo and found that satisfaction has a significant direct and indirect effect on loyalty (Ganic et al., 2018). It is has generally been agreed that commitment, trust and customer satisfaction directly or indirectly affect customer loyalty in Germany. Subandi and Hamid (2021) found that service quality has a significant effect on loyalty and motivation through satisfaction. Furthermore, the authors argue that academic services significantly influence success and loyalty. Justin et al. (2019) found a significant and positive relationship between satisfaction and loyalty in a higher education institution in China. Annamdevula and Bellamkonda (2016) conducted a study on seven public universities in India and found that satisfaction has a significant effect on loyalty and also satisfaction has a mediating role between service quality and loyalty. Mansori et al., (2014), in their study of different higher education institutions in Malaysia, found that physical characteristics provided the highest impact on satisfaction from dimensions of service quality. In addition, it has been understood that satisfaction has a mediating role between service quality and loyalty. The significant relationship or positive effect (direct or indirect) between service quality, satisfaction and loyalty is consistent with the results of numerous studies in the relevant literature (Ali et al., 2016; Arrivabene et al., 2019; Borishade et al., 2021; Fernandes et al., 2013; Gould-Williams, 1999; Munizu & Hamid, 2015). Based on the results of previous studies, it is possible to say that

service quality and satisfaction are important determinants of loyalty (Supriyanto et al., 2021). As a result of the literature review, the following hypotheses were developed;

**H2:** There is a positive relationship between satisfaction and loyalty among the academic staff in higher education institutions.

**H3:** There is a positive relationship between the service quality perception and loyalty among the academic staff in higher education institutions.

**H4:** Satisfaction of academic staff in higher education institutions has a mediating role between service quality and loyalty.

In the light of the extant literature on the subject issue and its importance in higher education institutions, the current research would put to test the following model empirically.
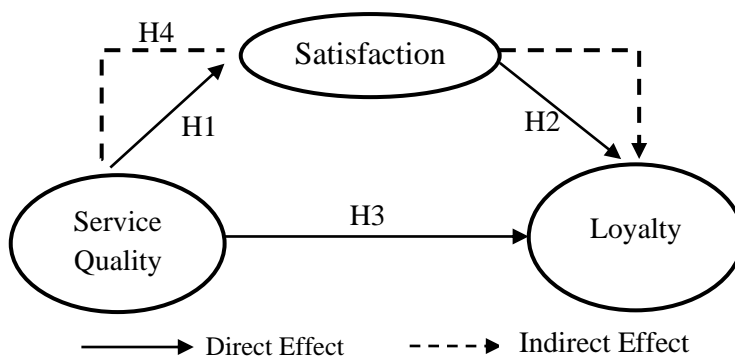


*Figure 1:* Research Model

**Materials and Methods**

The survey method was used to obtain the necessary data for the research. As a result of a comprehensive literature review, a survey form suitable for the purpose of this study was prepared. The survey consists of two parts. The first section includes statements regarding the demographic structure of the participants. The second section contains statements related to service quality, satisfaction and loyalty. While service quality consists of five dimensions (physical characteristics/tangibles, reliability, responsiveness, assurance, empathy), satisfaction and loyalty variables consist of a single dimension. The SERVQUAL method, which is widely used in the literature, was used to measure service quality (Ersöz et al., 2009; Tzeng and Chang, 2011). To measure loyalty and satisfaction variables, the scales used by Chandra (2018), Annamdevula and Bellamkonda (2016) and Kılıçlı et al. (2019) were used. The level of participation of the

statements in the survey (*1=Strongly Disagree, 2=Disagree, 3=Neutral, 4=Agree, 5=Strongly Agree*) was formed as a 5-point Likert type. The survey was uploaded to the project automation system of the SRP coordination unit. Academic staff participated in the survey online through this system. Data analysis was performed using "SPSS 26" and "AMOS 24" statistical programs. The demographic characteristics, correlation analysis between variables, reliability and validity analyses were conducted through SPSS software. Confirmatory factor analysis (CFA) and structural model analysis were performed using AMOS software.

**Population and Sampling**

The study population consists of academic staff who received services from the SRP coordination unit in 2021–2022. Throughout the mentioned dates, a total of 971 researchers received services from the SRP coordination unit. The sample size was calculated as 275 within the 95% confidence interval and 0.05 sampling error (Retrieved 27th October, 2022 from www.surveysystem.com). In the study, feedback was obtained from 281 participants.

**Analysis and Findings**

Detailed information about the demographic characteristics of the participants is presented in Table 1 below.

Table 1: *Information on Demographic Characteristics (N= 281)*

| **Variables** | | **N** | **%** |
|---|---|---|---|
| Gender | Female | 68 | 24.2 |
| | Male | 213 | 75.8 |
| Age | 20 – 29 | 4 | 1.4 |
| | 30 - 39 | 78 | 27.8 |
| | 40 - 49 | 117 | 41.6 |
| | Above 50 | 82 | 29.2 |
| Working Area | Sciences and Engineering Sciences | 143 | 50.9 |
| | Health Sciences | 70 | 24.9 |
| | Social Sciences and Humanities | 68 | 24.2 |
| Working Time | 1 – 5 | 27 | 9.6 |
| | 6 – 10 | 83 | 29.5 |
| | نومبر-15 | 48 | 17.1 |
| | 16 – 20 | 32 | 11.4 |
| | Above 20 | 91 | 32.4 |

When Table 1 is analysed, it is seen that 24.2% of the participants are female and 75.8% are male. When the age range of the participants is analysed, it is seen that the participants between the ages of 40-49 constitute the highest rate with a high rate of 41.6%, while the participants in the 20-29 age range have the lowest rate with a rate of 1.4%. While the rate of science and engineering sciences in the study area is high (50.9%), the rate of researchers in the fields of health sciences

and social and human sciences is close to each other. Moreover, the proportions of researchers in the fields of health sciences and social sciences and humanities are close to each other. When the working time of the researchers is analysed, it is understood that the highest rate of working time is 21 and over (32.4%), while the participants with 1-5 working time (9.6%) have the lowest rate.

## Descriptive Statistics

Table 2: *Descriptive Statistics of Variables*

| Variables | Mean | Std. Deviation | Skewness | Kurtosis |
|---|---|---|---|---|
| Tangibility | 3.72 | 0.05 | -0.86 | 1127. |
| Reliability | 3.68 | 0.05 | -0.88 | 0.91 |
| Responsiveness | 3.69 | 0.05 | -0.82 | 1068. |
| Assurance | 3.80 | 0.05 | -0.86 | 1073. |
| Empathy | 3.60 | 0.05 | -0.50 | 0.26 |
| Service Quality | 3.70 | 0.05 | -0.79 | 1042. |
| Loyalty | 3.76 | 0.05 | -858. | 0.95 |
| Satisfaction | 3.80 | 0.05 | -0.85 | 0.86 |

Table 2 shows that among the variables evaluated within the scope of the research, the variables of satisfaction (3.80) and assurance (3.81) have the highest mean, while the variable with the lowest mean is the empathy variable (3.60). In addition, among these variables, service quality has the lowest standard deviation (0.045), while the reliability dimension has the highest standard deviation (0.051).

One of the analyses that should be tested before proceeding to the analyses related to the data set is normality analysis. The indicators that must be considered in normality analysis are skewness and kurtosis values. According to Kalaycı (2008), skewness and kurtosis values between -2 and +2 indicate that the data are normally distributed (Karadeniz et al., 2019). Therefore, it is possible to say that the data are normally distributed according to the skewness and kurtosis values in Table 2.

## Correlation Analysis

Another important issue that must be considered before proceeding to hypothesis testing is the correlation analysis among variables. Correlation analysis helps to determine whether there is multicollinearity between variables. It is said that multicollinearity exists when the correlation coefficient between the variables has a coefficient of 0.90 and above (Kılıçlı, 2022). The results of the correlation analysis between variables are presented in Table 3 below.

**Table 3:** Correlation Analysis Results between Variables

| Variables | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| Tangibility | 1.00 | | | | | | |
| Reliability | 0.74** | 1.00 | | | | | |
| Responsiveness | 0.76** | 0.88** | 1.00 | | | | |
| Assurance | 0.70** | 0.84** | 0.89** | 1.00 | | | |
| Empathy | 0.70** | 0.81** | 0.87** | 0.85** | 1.00 | | |
| Service Quality | 0.85** | 0.83** | 0.86** | 0.82** | 0.82** | 1.00 | |
| Loyalty | 0.61** | 0.70** | 0.66** | 0.64** | 0.64** | 0.71** | 1.00 |
| Satisfaction | 0.76** | 0.81** | 0.85** | 0.84** | 0.86** | 0.89** | 0.87** | 1.00 |

*N:240; **p<0.01.*

Results in Table 3 show that there in issue of multicollinearity among the variables as none of the values exceeds the limit of 0.9. The results also exhibit the existence of a statistically significant and strong relationship between service quality, loyalty, and satisfaction [($r = 0,890;0,706$), $p<0,01$]. In addition, the results also show the existence of a positive and statistically significant correlation among all service quality dimensions loyalty and satisfaction ($p<0,01$).

## Reliability and Validity Analysis

The reliability of the variables used in this study was tested by internal consistency analysis. In the internal consistency analysis, in addition to Cronbach's Alpha value, the Composite Reliability analysis method, which has been commonly used by researchers in recent years, was used. Cronbach Alpha (CA) and Composite Reliability (CR) values of 0.70 and above (CA≥0.70, CR≥0.70) indicate that the statements in the scale are at a reliable level (Yaşlıoğlu, 2017). Additionally, construct and convergent validity were used to test the scales. Confirmatory Factor Analysis (CFA) was used to measure the construct validity of the dependent and independent variables, and the AVE (Average Variance Extracted) value was used to measure convergent validity. In this study, the lower limit value of factor load was taken as 0.40 (Annamdevula and Bellamkonda 2016). To ensure construct validity, the AVE value is expected to be greater than 0.50 and also the CR values are expected to be greater than the AVE value (*CR>AVE; AVE>0.50*) (Borishade et al., 2021; Yaşlıoğlu, 2017). The findings regarding the CFA results and reliability-validity values of the scales used in the study are shown in Table 4.

Table 4: *Reliability and Validity Analysis Results*

| Scale/ | Statements | Factor load | CR | CA | AVE |
|---|---|---|---|---|---|
| Tangibility (TAN) | The unit has a modern equipment | 0.72*** | | | |
| | The internal environment and offices of the Unit are pleasing to the eye | 0.54*** | | | |
| | The employees are skilled. clean and neat in appearance | 0.87*** | 0.74 | 0.85 | 0.53 |
| | The tools and equipment used are attractive to the eye. | 0.74*** | | | |

| | | | | | |
|---|---|---|---|---|---|
| **Reliability (REL)** | The timely fulfillment of promised services | 0.78*** | | | |
| | Sincere interest in the requested services | 0.84*** | 0.76 | 0.88 | 0.64 |
| | Providing the right service. the first time | 0.83*** | | | |
| | Keeping records regularly and accurately | 0.75*** | | | |
| **Responsiveness** | Declaring when the service will be provided | 0.73*** | | | |
| | Trying to provide service as soon as possible | 0.85*** | 0.77 | 0.89 | 0.66 |
| | Always willing to help | 0.86*** | | | |
| | Never reported busyness | 0.83*** | | | |
| **Assurance (ASS)** | Employees create a sense of trust in researchers | 0.92*** | | | |
| | Feeling safe in relations with the unit | 0.92*** | 0.79 | 0.93 | 0.67 |
| | Employees are always courteous | 0.85*** | | | |
| | Employees have the level of knowledge to respond | 0.82*** | | | |
| **Empathy** | Employees are taking care of the needs of the researchers | 0.81*** | | | |
| | Having appropriate working hours | 0.73*** | | | |
| | Putting the interests of researchers above all else | 0.72*** | 0.75 | 0.86 | 0.57 |
| | Employees understand the specific requirements | 0.77*** | | | |
| **Loyalty** | The positive impression created by the unit | 0.87*** | | | |
| | The unit meets the needs and expectations | 0.74*** | | | |
| | Willingness to share the positive impression created by the unit through social media etc. | 0.79*** | 0.8 | 0.91 | 0.7 |
| | Being proud to be associated with the activities offered by the unit | 0.93*** | | | |
| | Desire to benefit from the services offered again | 0.88*** | | | |
| **Satisfaction (SAT)** | Satisfaction with administrative and support services | 0.83*** | | | |
| | Easy and accessible facilities offered by the unit | 0.75*** | 0.78 | 0.93 | 0.65 |
| | Recommending the unit to the environment | 0.90*** | | | |
| | Overall satisfaction with the services | 0.95*** | | | |

*N:240; ***p<0.001.*

Table 4 illustrates that the service quality scale consists of five dimensions (tangibility, reliability, reliability, enthusiasm, assurance, empathy), while the loyalty and satisfaction scale consists of one dimension. As a result of CFA, the factor loads of the expressions related to the variables varied between 0.544 and 0.950. When the factor loads of the statements are analysed, it is seen that all factor loads are above 0.40 and statistically significant ($p<0.001$). Moreover, AVE values of the dimensions are above 0.50 (*AVE>0.50*) and CR values are greater than AVE values (*CR>AVE*). From this point of view, according to Yaşlıoğlu (2017:78), it is possible to say that the variables used in the research provide structural and convergent validity. According to Yaşlıoğlu (2017), it is possible to say that the variables used in the research provide structural and convergent validity. In this case, there is no need to remove any statement in the scale. In addition, it is possible to say that the statements in the scale are suitable for the purpose and scope of the study. When the results regarding the reliability of the variables in Table 4 are analyzed, it is understood that the CA and CR values are above 0.70 (*CA≥0.70, CR≥0.70*). This result indicates that 29 expressions of the variables have a reliable and valid structure.

**Structural Model Analysis and Testing Hypotheses**

Path analysis was used to determine the direct and indirect effects of the variables used in this study. Path analysis is a multi-directional structural model used to examine the direct and indirect effects between multiple independent and dependent variables, which leads to more reliable and consistent results. Path analysis can calculate measurement errors between variables. This feature makes path analysis more advantageous than traditional regression analysis. (Gürbüz & Şahin, 2018).

In the literature on the mediation effect between variables, there is more than one traditional approach, such as the causality approach of Baron and Kenny (1986), the Sobel and Goodman test (Yılmaz & Dalbudak, 2018). When we look at the research conducted in recent years, the contemporary approach is preferred in mediating effect models due to the criticisms made of the traditional approaches. Contemporary approaches can produce more reliable and valid results than traditional approaches (Gürbüz, 2019). In this study, Bootstrapping method, one of the contemporary approach methods, was used to mention the mediation effect and the number of 5,000 was preferred. In the analyses made with the bootstrapping method, 95% confidence interval (CI) values were taken into account in the validity and significance of the research hypotheses. Confidence interval values should not include zero (0) values. Otherwise, it is not possible to mention any mediation effect (Kılıçlı, 2021). The structural model used in testing the hypotheses developed in the research is presented in Figure 2 below.
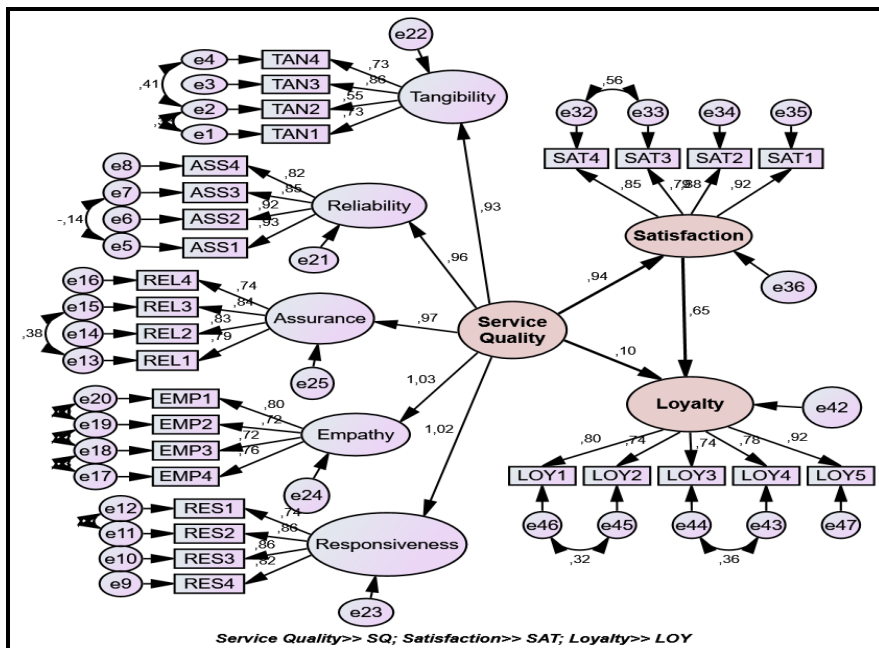
*Figure 2*: Structural Equation Model (SEM)

   The goodness of fit values should be examined to determine the reliability and validity of the structural model presented in Figure 2. In the literature, it is possible to find a large number of the goodness of fit values. In this study, the goodness of fit values, which are frequently used by researchers, are included (Wantara, 2015; Annamdevula and Bellamkonda 2016; Alkhamis, 2018; Munizu and Hamid, 2015). At first, while testing the structural model, it was understood that the goodness-of-fit values were not within the accepted limits. For the goodness-of-fit values to be within the values accepted in the literature, modifications between some error terms in the structural model were made (Figure 2). After the corrections made between the error terms, the analysis continued. As a result of the analysis, it was understood that the structural model provided the desired goodness of fit values. The goodness of fit values for the structural equation model are presented in Table 5 below.

Table 5: *SEM Goodness of Fit Values*

| Index | Excellent fit values | Acceptable values | Model value | Result |
|---|---|---|---|---|
| $\chi^2/df$ | $\leq 3$ | $3 \leq \chi^2/df \leq 5$ | 2.77 | Excellent |
| RMSEA | $\leq 0.05$ | $\leq 0.08$ | 0.079 | Acceptable |
| SRMR | $\leq 0.05$ | $\leq 0.08$ | 0.046 | Excellent |
| CFI | $\geq 0.95$ | $\geq 0.90$ | 0.92 | Acceptable |
| GFI | $\geq 0.95$ | $\geq 0.85$ | 0.8 | Bad |
| IFI | $\geq 0.95$ | $\geq 0.90$ | 0.93 | Acceptable |
| CMIN($\chi 2$) =991.50 (p<0.001). df=358 | | | | |

In Table 5, it is shown that $\chi^2/df$ and SRMR goodness of fit values are at an excellent level. Furthermore, other goodness of fit values (RMSEA, CFI, IFI) is within the accepted limits (except GFI). Based on the goodness of fit values shown in Table 5, it is possible to conclude that the developed structural model is generally reliable and appropriate. This result is an indication that the data used in the study are compatible with the structural model.

The direct and indirect effects between the dependent and independent variables within the scope of the structural equation model and the results of the hypotheses developed in the study are shown in Table 6.

Table 6: *Results of SEM and Research Hypotheses*

| Variables | Total Effect | | | | | | |
|---|---|---|---|---|---|---|---|
| | B | | | | $\beta$ | | |
| SQ→LOY | 0.66 | | | | 0.72 | | |
| | Direct Effect | | | | | | |
| | B | $\beta$ | S.E. | C.R. | p | Hypothesis | Result |
| SQ→ SAT | 1.2 | 0.94 | 0.09 | 12.8 | 0.000*** | H1 | **Accept** |
| SAT→ LOY | 0.5 | 0.65 | 0.15 | 3.29 | 0.00** | H2 | **Accept** |
| SQ→ LOY | 0.1 | 0.1 | 0.18 | 0.52 | 0.6 | H3 | **Reject** |
| | Indirect Effect | | | | | | |
| | B | *B* | Bootstrapping (Lower Bound/ Upper Bounds) %95 CI | | | Hypothesis | Result |
| SQ→ SAT→LOY | 0.568 | 0.614 | 0.209/1.193 | | | H4 | **Accept** |

In Table 6, the path coefficient shows the direct effect of service quality on satisfaction, is a high coefficient of approximately 0.94 ($\beta=0.941$). A one-unit increase in service quality will lead to a high increase of 0.94 units in satisfaction. Moreover, this effect is statistically significant. This result shows that service quality has a positive and statistically significant effect on satisfaction ($\beta=0.941$; $p<0.001$). This relationship is a one-way, positive and significant structural

relationship. Accordingly, it is possible to say that the H1 hypothesis, which is one of the research hypotheses, has been confirmed.

Regression coefficient in table 6 reflects the direct effect of satisfaction on loyalty is approximately 0.65 (β=0.*653*). A one-unit increase in satisfaction will lead to a 0.65-unit increase in loyalty. Moreover, this effect is statistically significant. This shows that satisfaction affects loyalty positively and statistically significantly (*β=0.653; p<0.01*). This relationship is a one-way, positive and significant structural relationship. Accordingly, it is possible to say that the H2 hypothesis, which is one of the research hypotheses, has been confirmed.

Table 6 shows that the total effect (direct and indirect) coefficient of service quality on loyalty is approximately 0.72 (*β=0.715*). This total effect shows that by including all variables in the model, service quality affects loyalty with a high coefficient of 0.72. However, the direct impact of service quality on loyalty is as low as 0.10 (*β=0.101*). It is possible to say that the direct effect of service quality on loyalty is weaker than the total effect. According to the direct effect, a one-unit increase in service quality will lead to a low increase of 0.10 in loyalty. This effect of service quality on loyalty is statistically insignificant. Thus, as a result of SEM, although the effect of service quality on loyalty is positive, it is statistically insignificant (*β=0.101; p>0.05*). This relationship is a one-way, positive and insignificant structural relationship. Accordingly, it is possible to say which one of the research hypotheses, H3, is not confirmed.

Table 6 includes information related to indirect impacts as well as direct impacts. This mediating effect is the mediating role of satisfaction, which is the fourth hypothesis of this study. The effect of service quality on loyalty through satisfaction is approximately 0.61 (*β= 0.614*). Bootstrapping test was applied to calculate whether the mediation effect of satisfaction is significant and valid. In order to talk to mention any mediating effect, we have stated above that the lower and upper confidence intervals should not contain the value of zero (0) as a result of the Bootstrapping test. According to the 95%CI results in Table 6, is understood the lower and upper confidence interval values do not include the value 0 [*%95CI (0,209/1,193)*]. This result indicates that satisfaction has a mediating role between service quality and loyalty. As a result of the analyses, it is possible to say that the H4 hypothesis, which is one of the research hypotheses, has been confirmed.

## Discussion and Result

### Service quality and satisfaction

As a result of SEM analysis, service quality has a positive and statistically significant effect on satisfaction (Table 6). Therefore, it is possible to say that the high effect coefficient of service quality on satisfaction *(β=0.941; p<0.001)*

supports the results of previous studies (Alam, 2021; Ali et al., 2016; Annamdevula & Bellamkonda 2016; Borishade et al., 2021; Brown & Mazzarol, 2009; Kılıçlı et al., 2019; Razak et al., 2021; Singh and Jasial, 2021). This study reveals that service quality may be the most important factor affecting the satisfaction of researchers (Giovanis et al., 2014). This result also confirms Wantara's (2015) statement that "service quality is the premise of satisfaction". Inadequate services provided by researchers, managers, employees, or other supporting elements can lead to reduced performance of researchers. According to the results of this study, it is possible to say that service quality has a vital role in the satisfaction and motivation of researchers.

**Satisfaction and loyalty**

It is understood from the analysis of this survey reveals that the effect of satisfaction on loyalty is positive and statistically significant (Table 6). This result confirms the hypothesis that satisfaction affects loyalty. Also, supports the idea of Subandi and Hamid (2015) that "the higher the satisfaction, the higher the loyalty". In this study, it can be said that the positive effect of satisfaction on loyalty in higher education institutions is in line with this idea. In addition, this result is consistent with the results of many studies in the literature (Annamdevula & Bellamkonda, 2016; Chandra et al., 2018; Justin et al., 2019; Munizu & Hamid, 2015).

One of the hypotheses developed in this study is the hypothesis regarding the mediating effect of satisfaction. The result shows that when researchers are satisfied with the services provided in higher education institutions, researchers' loyalty is ensured. Based on this result, it is possible to say that satisfaction mediates between service quality and researchers' loyalty. Kotler (2005) argues that the satisfaction created by quality will also bring consumer loyalty. The author states that the high satisfaction provided by the quality affects not only the rational preferences of the consumers but also the emotional attachment to a particular brand (Bakrie et al., 2019). Therefore, this mediating role of satisfaction between service quality and loyalty supports the idea of Kotler (2005). Moreover, this finding is consistent with studies in the field of marketing, which reveal that satisfaction is the most important antecedent of loyalty (Borishade et al., 2021). The result regarding the mediating role of satisfaction confirms the results of previous researches (Borishade et al., 2021; Bui et al. 2022; Subandi & Hamid, 2021). However, these results are not in line with some other researches (Bakrie et al., 2019; Ismanova, 2019).

**Service quality and loyalty**

Based on the results of the study, researchers' perceptions of service quality have an insignificant effect on loyalty. Gould-Williams (1999: 113) emphasizes that service quality is an important strategy to retain existing customers. Because, according to the author, superior service quality also brings loyalty. Thus, the

author emphasizes that service quality plays an important role in ensuring customer loyalty. In this study, the weak and insignificant effect of service quality on loyalty contradicts the theoretical theory emphasized by Gould-Williams (1999). Although the insignificant relationship between service quality and loyalty in this study contradicts the results of many studies in the literature (Annamdevula & Bellamkonda, 2016; Borishade et al., 2021; Bui et al., 2022; Chandra et al., 2018; Justin et al., 2019; Munizu and Hamid, 2015; Subandi and Hamid, 2021;), it also supports the results of most studies (Bakrie et al., 2019; Chandra et al., 2018; Ganic et al., 2018; Li, 2013; Supriyanto et al., 2021). This situation indicates that studies that examine the relationship between the quality of services and loyalty in the literature do not match common ground. Therefore, it is possible to say that more studies are needed for studying the relationship between these variables to produce clear and consistent results.

**Managerial implications, future work and limitations**

A service business needs to measure the quality of the services it provides to have a sustainable quality understanding. Only in this way can it improve its services and ensure customer satisfaction or loyalty (Yılmaz et al., 2007). Performance measures may vary according to the standards of organizations and the services they provide. Customer loyalty, especially in public service organizations, can be affected by various internal or external factors. It is understood from previous studies that the best performance measure from outside the organization comes from the satisfaction perception of stakeholders.

Based on the results of the analyses, the weak and insignificant effect of service quality on loyalty is an important issue that managers should focus on. Academic staff who conduct research have an important share in the development of the quality of education in higher education institutions. Therefore, improving the opportunities for researchers will provide higher education institutions with a significant competitive advantage. The high service quality of SRP coordination units, which have an important place in supporting R&D activities, will bring satisfaction and loyalty. This will make a significant contribution to the publication of more quality articles by researchers in journals with high impact or to the realization of more high-value-added projects. Therefore, managers should give more importance to a maximum service quality understanding to gain the loyalty of researchers. Therefore, higher education institutions should strive to increase service quality to enhance students' satisfaction, institutional reputation, and ultimately researcher loyalty (Bakrie et al., 2019).

It is possible to mention the scarcity of studies on service quality perceptions, satisfaction and loyalty of academic staff in higher education institutions in Turkey. The idea that it will make an important contribution to the literature by

taking advantage of this gap has been a source of motivation for the formation of this study. Because, considering the service quality, satisfaction and customer loyalty of SRP units, which have an important place in the development of R&D activities in higher education institutions, as a whole, searching the relationship between them and evaluating the results will make an important contribution to the field. SRP units have as important a role in the international competitiveness of higher education institutions as other national supporting institutions. Researchers make important contributions to science with the support they receive from these units. In addition, their support for master's degrees, Ph.D. and postdoctoral projects enables the development and training of many researchers. It is possible to say that this study will be a guiding source in terms of shedding light on the researchers who will work in this field in the future, the BAP units in other universities and the aspects of these units that are missing or need to be developed. In addition, by using these variables, a comparative analysis between private or public institutions and organizations can be made to contribute to the related literature. Adding different variables such as institutional image, research costs, and competitive advantage to the variables used in the research will provide more scientifically different results.

The limitation of this study is that it was applied in a unit that provides support to R&D activities in a public university. Therefore, the findings of the study cannot be generalized to the SRP units of all universities in Turkey.

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