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IS THERE A NEED TO DEVELOP A SEPARATE SERVICE QUALITY SCALE FOR EVERY SERVICE SECTOR? VERIFICATION OF SERVQUAL IN HIGHER EDUCATION SERVICES

HERBIR HIZMET SEKTÖRÜ İÇIN FARKLI HIZMET KALITESI ÖLÇEĞI GELIŞTIRILMESINE GEREK VAR MIDIR? SERVQUAL ÖLÇEĞININ YÜKSEK ÖĞRETIM HIZMETLERINDE GEÇERLILIĞININ DOĞRULANMASI

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ABSTRACT

Quality is an essential element of satisfaction leading to customer retention. Hence, quality assessment is vital for business success. SERVQUAL is one of the widely accepted scales of measuring service quality while being exposed to several criticisms regarding fitness of the scale in different service sectors due to specific features of each service. In this study, the research field is identified as higher education and it is aimed to explore whether sector specific, developed and adapted by the authors, or the original five-factor or three-factor SERVQUAL scales would be more appropriate to measure service quality in this sector. The results reveal that the adapted scale is valid, reliable and have good model fit according to the confirmatory factor analysis. However, the model fit indices of the original five-factor SERVQUAL are better than those of the three-factor SERVQUAL and the adapted scale. The authors conclude that five-factor SERVQUAL is a more sufficient instrument to be used in higher education than a sector specific scale. This finding is expected to save service providers' time and effort on assessing their quality by developing new sector specific scales. Further research is needed to validate SERVQUAL as a universal scale in all service sectors.

ÖZET

Kalite, müşteriyi elde tutabilmenin ön koşulu olan müşteri memnuniyetinin sağlanmasında önemli bir faktördür. Bu nedenle, kalite değerlendirmeleri, işletmelerin başarılı olabilmeleri açısından büyük önem

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taşımaktadır. SERVQUAL, hizmet kalitesini ölçmede oldukça kabul görmüş bir ölçek olmasına rağmen, hizmetlerin farklı özellikleri nedeniyle değişik hizmet sektörlerinde kullanılabilirliği ile ilgili olarak eleştirilere maruz kalmıştır. Çalışmanın amacı; yüksek öğretimde hizmet kalitesinin ölçümü için sektöre özel geliştirilen bir ölçeğin orijinal beş-boyutlu ve üç-boyutlu SERVQUAL ölçeklerinden daha uygun olup olmayacağının araştırılmasıdır. Sonuçlar, sektöre özel geliştirilen ölçeğin geçerli ve güvenilir olduğunu ortaya koymaktadır. Doğrulayıcı faktör analizi ise her üç ölçeğin de model uyumlarının iyi olduğunu göstermektedir. Ancak, SERVQUAL ölçeğinin model uyum endeksleri, sektöre özel ölçeğe ve üç-boyutlu SERVQUAL ölçeğine ait endekslere göre daha iyi sonuçlar vermektedir. Bu doğrultuda yazarlar, yüksek öğretim alanında hizmet kalitesi değerlendirmelerinde beş-boyutlu SERVQUAL ölçeğinin daha güçlü bir ölçek olduğu sonucuna varmışlardır. Bu bulgu ile hizmet sağlayıcılarının sektöre özel hizmet kalitesi ölçekleri oluşturabilmek için harcayacakları ekstra zaman ve çabanın önüne geçilmesi beklenmektedir. İleride yapılacak çalışmalarda da SERVQUAL'ın tüm hizmet sektörlerinde kullanılabilecek genel geçer bir ölçek olup olmadığının araştırılması gerekmektedir.

Service quality; SERVQUAL; higher education; confirmatory factor analysis
Hizmet kalitesi; SERVQUAL; yüksek öğretim; doğrulayıcı faktör analizi

INTRODUCTION

Quality is an important phenomenon in business life because it is a determinant of customer satisfaction and cost minimization. It also signals competitiveness and success in the market. Zero defect manufacturing, total quality management and quality function deployment methodologies are developed to improve quality and hence, provide higher customer satisfaction. All these efforts are targeted to manufacturing sector. Using these methods, producers can improve their products' quality. However, it is very hard to guarantee a certain quality level in production of services due to its characteristics. The quality of services depends on who provides the service, when, where, how and to whom. Since service quality varies, it is very hard to provide a constant quality level.

On the other hand, as people's living standards increase or as the marketing communications make people believe that they deserve the best all the time, people's expectations from life as well as from products and services are increasing. Consumerism also has increased the expectations and made consumers more conscious. As Donnelly and Shin (1999) denoted 'service levels that were thought to be acceptable a few years ago, are not accepted in many service sectors now'. As it is now in the future, companies will try their best to achieve customer delight because satisfaction of the customers will not be enough to retain them (Shneider and Bowen, 1999 as cited in Briggs, Sutherland and Drummond, 2007). Therefore, it is essential for service providers to observe the expectations of their customers and their performance to meet these expectations.

A number of academicians have attempted to develop an instrument to measure service quality. One of these approaches belongs to Parasuraman, Zeithaml and Berry (1985- 1988) who developed a scale to measure service quality named SERVQUAL. While many studies support this instrument, there are some criticisms related to issues like items not loading on the same dimensions when applied in different service sectors (Carman, 1990; Cronin and Taylor, 1992; Donnelly and Dalrymple, 1996; Donnelly and Shin, 1999; Smith, Smith and Clarke, 2007), validity, usage of 7-point Likert scale (Babakus and Mangold, 1992), inclusion of both negative and positive statements, the gap approach (Carman, 1990; Cronin and Taylor, 1992) and so on. Also, time is another consideration which is thought to create some problems. The expectations and perceptions related to the performance are measured at the same time. However, expectations occur before the purchase and the usage of the service. Hence, this time difference is argued to create a variation in the evaluation of expectations.

Furthermore, there is no consensus on the applicability of SERVQUAL to all service sectors. Some researchers support the idea that every service sector should have its own service quality measurement instrument since each service sector has specific and distinguished characteristics.

This study aims to develop a quality measurement scale specific to the higher education service sector. The developed scale will be compared to the original five-dimensional and three-dimensional SERVQUAL models to evaluate the fit of the scales to higher education. The results are expected to guide whether the original scales are applicable to the higher education sector or there is a need to develop new instruments for each service sector.

1. LITERATURE REVIEW

1.1. Service Quality Concept and Measurement

As mentioned earlier, the quality definitions emerged from physical products sector. At first, quality was thought to be providing zero defects-doing it right the first time. Crosby (1979) defined quality as “conformance to requirements”. Later on businesses figured out that all customers were not satisfied even though the products were free of defects. If quality is related to customer satisfaction, than high quality product should meet the expectations of customers. In this sense, service quality was defined as “conforming to customer expectations on a consistent basis” (Lewis, 1983).

Service quality concept was further investigated under certain quality dimensions. Grönroos (1984) investigated service quality under two dimensions: Technical and functional quality. Technical quality is related to what actually the customer is receiving. Functional quality, on the other side, is the way the service is delivered. Other researchers have discussed and categorized service quality in different levels or dimensions (Garvin, 1987; Johnston, Sivestro, Fitzgerald and Voss, 1990; Lehtinen and Lehtinen, 1982;

Parasuraman et al., 1985, 1988; Sasser, Olsen, and Wyckoff, 1978; Walker, 1990).

There is no consensus on the dimensions of the service quality but the most accepted and most frequently used approach called SERVQUAL is developed by Parasuraman et al. in 1985 and reorganized in 1988. This measurement uses the disconfirmation approach by defining service quality as the gap between the prior expectations with the post experience perceptions. If the perceptions about the performance are greater than what was expected, than the quality is said to be high.

SERVQUAL uses 22 items under five dimensions which are tangibility, reliability, responsiveness, empathy and assurance. The dimensions and what they measure is explained below (Parasuraman et al., 1991):

1. **Tangibility**- the appearance of physical facilities, equipment, personnel, and communications materials.
2. **Reliability**- the ability to perform the promised service dependably and accurately
3. **Responsiveness**- the willingness to help the consumers and to provide prompt service
4. **Empathy**- The provision of caring, individualized attention to consumers
5. **Assurance**- the knowledge and courtesy of employees and their ability to convey trust and confidence.

After the proposal of five-dimensional SERVQUAL scale, criticisms are brought about the number of dimensions of the scale. Several studies have found a three-dimensional structure rather than five-dimensions (Kettinger and Lee, 1994; Nitecki, 1995). Regarding these criticisms, Parasuraman, Zeithaml and Berry (1994) have retested the scale and supported both five and three-dimensional structure where responsiveness, assurance and empathy meld into a single factor. However, the support for five-dimensional structure was stronger.

Although SERVQUAL is used widely to assess service quality; there have been some arguments about its applicability. One of those arguments is related to whether the instrument is universal or not. In other words, SERVQUAL is criticized to be unable to measure different service sectors adequately. Hence, it is proposed to develop sector specific SERVQUAL instrument. On the other hand, the researchers who support SERVQUAL emphasize that it is a general service quality measurement instrument which is applicable to all service sectors adequately.

Finn and Lamb (1991) concluded that five-dimensional structure of SERVQUAL did not have a good fit for the retail service setting and without changing the instrument, it can not be a valid measure for retail services. Gagliano and Hathcote (1994) conducted a similar study for apparel specialty retailing store services. They used 22 item SERVQUAL scale and found

four- dimensional structure. Only the reliability and the tangiblity dimensions were fairly the same with the original study. They proposed an adaptation of SERVQUAL to the apparel specialty store setting to be accepted as a valid measurement.

Moreover, a study conducted in the retailing sector revealed a poor fit for the five dimensions as a result of a confirmatory factor analysis (Dabholkar, Thorpe and Rentz, 1996). They also found insufficient discriminant validity index between responsiveness and assurance. The authors proposed to develop industry specific measures of service quality using qualitative research. In their study, they developed a new service quality measure for the retail services that had a better fit.

Cronin and Taylor (1992) applied SERVQUAL in four different sectors: banks, pest control, dry cleaning and fast food. The confirmatory factor analysis results confirmed that five-dimensional structure does not fit to all sectors. There was a poor fit between the theoretical model and its application in different sectors. Besides the above mentioned studies and researchers, Babakus and Boller (1992), Brown, Churchill and Peter (1993), Carman (1990), and Finn and Lamb (1991) also highlighted the need to customize the quality measurement to the sector. They mentioned that being private or public, in addition to the type of service, affects the dimensions of the SERVQUAL. These studies indicate the need for sector specific quality measurement scales.

On the contrary, Markovic (2006) and Wisniewski (2001) supported the usage of SERVQUAL in a large range of service sectors. Brysland and Cury (2001) determined that SERVQUAL can be applied in public service sector, too.

1.2. Service Quality and Higher Education

In higher education, the service quality is more critical since the customer (the student) cannot return the service if not satisfied. In addition, the competition is increasing among higher education service providers globally and domestically just like it is in other sectors. Universities are trying to develop new curriculums or improve the current one. They open new graduate programs. The academicians, who provide the academic service, require updating their knowledge so that they can integrate their lectures to the fast developing and changing world. Moreover, new universities are being opened in the world. In 1995, there were 56 universities whereas this number increased to 71 in 1998 and to 79 in 2003 in Turkey (Higher Education Council Report, 2005). This number has reached to 172 in 2011 (Higher Education Council, 2011). In this intense competitive environment, total quality management (TQM) should be integrated to the soul of higher education. On the other hand, students who are the customers of that service are becoming more conscious and selective. Due to all these developments, higher education institutions need to pay more attention to the assessment and the improvement of quality in their institutions. Managers

should also keep in mind that poor service quality affects the reputation of the service organization (Srikanthan and Dalrymple, 2003).

Higher education is given in either state or private universities. Up to 1997, there were only 8 private higher education institutions in Turkey (Higher Education Council Report, 2005). However in 2011, this number has increased to 61 (Higher Education Council, 2011). In private sector, "value for money" becomes more important in the evaluation of services. On the other side, in the state universities the aspects of the education might become more important and determine the satisfaction of the customers from the higher education service given. As Kangis and Voukelatos (1997) noted, there can be differences between private and public sector service expectations.

Few studies are done in higher education service quality measurement using SERVQUAL. Markovic (2006) carried out a study in tourism higher education in Croatia. In her study, she used all 22 original statements of the SERVQUAL measurement and she added 18 new statements for tourism and hospitality management education. 7 factors were found when the items were put into the factor analysis. 14 statements were deleted. Most of these deleted items were new. Among those seven factors, five of them were the original dimensions of the SERVQUAL. The two new dimensions were "students being in scientific work" and "e-learning". The study findings indicate that the original five dimensional SERVQUAL instrument is reliable and applicable to higher education. Besides, Qureshi, Shaukat and Hijazi (2010) used only the two dimensions (Responsiveness and Reliability) of SERVQUAL to assess relationship of service quality with students' satisfaction and motivation in public and private universities. The SERVQUAL dimensions (Responsiveness and Reliability) are found to be significantly related with students' satisfaction and motivation. It is concluded that students' satisfaction and motivation can be determined by the teaching quality offered at the institute. In the study of Shekarchizadeh, Rasli and Hon-Tat (2011), a modified SERVQUAL questionnaire comprising 35 items was used and these items were distributed into five different factors: professionalism, reliability, hospitality, tangibles, and commitment.

Smith et al. (2007) investigated the IT service quality in a university. They applied the SERVQUAL instrument for two sample groups: Students and the staff. They found four dimensions which were similar but not exactly the same with the original five dimensional structure. Some of the original dimensions were the antecedents of other dimensions. This dimensionality problem was also observed in other studies conducted in the public sector (Donnelly and Dalrymple, 1996; Donnelly and Shin, 1999).

2. METHODOLOGY

The aim of this study is to propose a sector specific service quality scale for higher education and to test the reliability, validity and the fitness of the model. In addition, due to the criticisms on the dimensionality of

SERVQUAL, the model fit of both the original five-dimensional (Parasuraman et.al, 1988) and three-dimensional structure (Parasuraman et.al,1994) with the developed scale's will be compared to determine the need for a sector specific service quality measurement in higher education.

In previous studies attempting to develop sector specific service quality measurement instrument, a new scale to be tested was formed by adding new items to and deleting some of the items in the original SERVQUAL measure. Literature review or /and qualitative research has been used to develop new items (Dabholkar et al., 1996). As a matter of fact, in this study, new items were also added to SERVQUAL scale and tested regarding the service quality in higher education sector in Dokuz Eylul University, Faculty of Business in Izmir, Turkey.

The first step of the methodology followed was a qualitative effort to identify the expectations of the students from an excellent faculty. This step comprised of two focus groups with students from each department (economics, international relationship, tourism management and business administration) within the faculty. Freshmen and sophomores from each department comprised the first focus group while junior and senior students formed the second. They were required to express their own expectations regardless of the interaction of the group. The rationale behind establishing focus groups with the students is to demonstrate additional statements to measure the service quality of higher education so that the respondents can comment on all aspects of the service that they are receiving as suggested by Philip and Hazlett (2001).

The focus group sessions revealed 24 statements which were then combined with the 22 original statements of the SERVQUAL scale. A pilot study, which constituted the second step, was conducted on a sample of students in order to see whether the statements were correctly comprehended. As a result of the pilot study, three of the original 22 items were dropped and three sub-statements were extracted from one of the items related to reliability dimension. Consequently, statements in SERVQUAL scale consisted of 21 original items and 24 new statements, the scale had a total of 45 items.

The questionnaire developed was divided into five sections. In the first section, demographic information of the students was asked. The second section was composed of 45 statements to measure the expectations of service quality from an ideal business faculty which was followed by the third section where the importance of five dimensions of service quality was asked. The fourth part was designed to measure the service quality perceptions related to Faculty of Business, Dokuz Eylul University. Finally in the fifth part, satisfaction levels related to five dimensions of service quality were evaluated.

Five-point Likert scale, anchored with 1=strongly agree, 5=strongly disagree, was used in the second and the fourth parts instead of seven-point scale proposed by the original SERVQUAL scale to decrease frustration of

the respondents while answering the questions (Babakus and Mangold, 1992).

The questionnaires were distributed to the whole faculty at the beginning of the courses (1206 students). However, only 421 of them were sufficient for the analysis. Data gathered was analyzed by SPSS 16 and the confirmatory factor analysis (CFA) was carried out by Lisrel 8.80.

3. FINDINGS

3.1. Sample Profile

The majority of the sample was females. Among the four departments, the highest enrollment is in Department of Business Administration. This is also seen in the composition of the sample. The highest number of sampling units belongs to the Department of Business Administration. This is followed by Departments of International Relations, Economics and Tourism Management, respectively. Most of the students who responded to the questionnaire are freshmen which are followed by sophomores.

Table 1: Student Profile

Demographic Characteristics		**n**	**%**
Gender	Male	185	44.0
	Female	234	55.7
	Total	**419**	**99.7**
Department	Business Adm.	164	39.0
	Economics	84	20.0
	International Rel.	99	23.5
	Tourism	74	17.6
	Total	**421**	**100.0**
Year of Study	1	132	31.5
	2	105	25.1
	3	78	18.6
	4	104	24.8
	Total	**419**	**100.0**

3.2. Reliability of the Original and Adapted SERVQUAL Scales

Internal consistency of expectations, perceptions and gap evaluations for the original SERVQUAL scale, the additional items extracted from the focus groups and the adapted SERVQUAL scale are illustrated in Table 2. The Cronbach's alpha for all constructs were greater than .85 providing a satisfactory level of reliability. The adapted SERVQUAL has higher Cronbach's alpha values compared to the original SERVQUAL scale.

Table 2: Reliability Coefficients of the Scale

Measurement Items	Category of Items	Cronbach's Alpha
SERVQUAL original scale	Expectation (21 items)	0,859
	Perception (21 items)	0,923
	Gap (21 items)	0.900
Added Items	Expectation (24 items)	0,872
	Perception (24 items)	0,905
	Gap (24 items)	0,900
Adapted SERVQUAL Scale	Expectation (45 items)	0,923
	Perception (45 items)	0,946
	Gap (45 items)	0,942

3.3. Factor Analysis Results

The adapted 45 item scale was analyzed through factor analysis using principle components with eigenvalues greater than 1 and 7 factors were extracted. Looking at the scree plot test, it was found that 5 factors would be more meaningful for this analysis. Hence, the same analysis was reconstructed with the limitation of 5 factors. The results are given in Table 3. The items which have a factor loading exceeding 0.50 are considered. 26 items were left among 45 items, 17 of which belong to the original SERVQUAL scale and the rest are newly added items (see Appendix 1 for the remaining new items).

The five dimensions found at the end of the factor analysis included either the original or the new items but never the mixture of both. The 2nd, and the 5th factors contained the newly added items while the1st, the 3rd and the 4th factors were comprised of the original items. Factor one **"Empathy and Assurance"** was a composition of three of the original dimensions: Assurance, Empathy and Responsiveness. It included all the items within empathy dimension and first and second items of assurance dimension. Moreover, only one of the items of responsiveness dimension appeared under the 1st factor.

The 3rd factor is composed of reliability and responsiveness dimensions correspondingly named as **"Reliability and Responsiveness"**. It carries all of the reliability items whereas only two of the responsiveness items appear under this factor. Hence, it can be said that the 1st factor is a composition of assurance and empathy dimensions and the 3rd factor is a composition of reliability and responsiveness dimensions, in general.

All the tangibility items –except Tan3- are grouped under the 4th factor. The previous studies (Bouman and Van Der Wiele, 1992; Markovic, 2006; Mels, Bosholff and Nel, 1997) had found similar results. The tangibility items were always grouped together under the same factor. Besides, empathy and assurance dimensions were grouped under the same factor in previous studies (Gagliano and Hathcote, 1994; Smith, et al., 2007).

Eight of the original SERVQUAL items are loaded under the 1st factor which is named **"Empathy and Assurance"**. This factor alone

explains more than 36% of the variance and has a high reliability coefficient (α=0.868). In addition, since this factor is the one which explains most of the variance within the measurement instrument and appears as the first factor, it indicates it is the most important factor.

The 5th factor **"Career Facilities"** consists of four statements regarding the impact of the faculty on students' career opportunities. Three of the statements are directly related to career opportunities of students. The statement "An excellent faculty has high criterion for student selection" is an indicator of better career opportunities for students. The higher the selection criterion of the faculty, the more likely the students will be employed by prestigious firms. All reliability coefficients of the factors are above the acceptable level of 0.60.

Table 3: Results of Factor Analysis and Reliability*

Factors and Statements		**Factor loadings**	**Cronbach's alpha**	**Cumulative variance explained (%)**
Factor 1			**0.868**	**36.764**
"Empathy and Assurance"	Resp4	0.714		
	Ass1	0.643		
	Ass2	0.609		
	Emp1	0.538		
	Emp2	0.592		
	Emp3	0.676		
	Emp4	0.560		
	Emp5	0.504		
Factor 2			**0.813**	**42.127**
"Curriculum customization and campus facilities"	N20	0.625		
	N23	0.703		
	N24	0.767		
	N8	0.519		
	N22	0.611		
Factor 3			**0.882**	**47.002**
"Reliability and Responsiveness"	Rel1	0.731		
	Rel2	0.831		
	Rel3	0.741		
	Rel4	0.698		
	Resp1	0.530		
	Resp2	0.519		
Factor 4			**0,663**	**51.821**
"Tangibility"	Tan1	0.754		
	Tan2	0.721		
	Tan4	0.784		
Factor 5			**0.737**	**55.568**
"Career Facilities"	N11	0.588		
	N9	0.662		
	N10	0.702		
	N6	0.704		
TOTAL			**0,928**	**55.568**

*Emp# denotes for empathy dimension and the number of the item within that dimension; Ass# denotes for assurance dimension and the number of the item within that dimension; Resp# denotes for responsiveness dimension and the number of the item within that dimension; Rel# denotes for reliability dimension and the number of the item within that dimension; Tan# denotes for tangibility dimension and the number of the item within that dimension; N# are the newly added items given in appendix 1.

3.4. Validity of the Adapted SERVQUAL Scale

On the basis of direct oblimin rotation (due to the high correlation between dimensions), five significant factors were found on the gap scale. Each item had a factor loading greater than 0.50 (ranging from 0.50 to 0.83). These high factor loadings indicate high correlation of the items with the factors they correspond to. Items' loading highly on the factors which they were assigned to is itself a test for convergent validity (Dabholkar et al., 1996). Therefore, adapted SERVQUAL dimensions for higher education can be said to have convergent validity.

Discriminant validity is a proof that the construct is unique and not identical to other constructs. Hair, Black, Babin, Anderson and Tatham (2006, p.153) claim that "items making up two constructs could just as well make up only one construct. Competing CFA models could be set up comparing the fit of a CFA assuming the items make up one construct with that of a CFA assuming they make up two constructs. If the fit of the two construct model is not significantly better than that of the one construct model, then there is insufficient discriminant validity". Therefore, the distinctiveness of the five constructs that assess service quality in higher education sector is measured by chi-square difference tests (Bentler & Bonett, 1980; James, Mulaik and Brett, 1982). The fit of measurement models of five nested models, ranging from the five-factor model to a single-factor model is assessed via Lisrel.

As depicted in Table 4, the chi-square difference tests demonstrated better fit with each more differentiated model. The one-factor model presented the worst outcomes. The one-factor model differed from the two-factor model (χ^2_{dif} = 126.16; d.f. $_{dif}$ =31; $p < 0.01$). The four-factor model differed from three-factor model (χ^2_{dif} = 143.44; d.f. $_{dif}$ =40; $p < 0.05$) and finally the five-factor model also differed from four-factor model (χ^2_{dif} = 204.83; d.f. $_{dif}$ =34; $p < 0.05$). Besides, the five factor model had the most acceptable values of RMSEA and CFI (Medsker, Williams and Holahan, 1994) which provides evidence that the adapted SERVQUAL scale has discriminant validity.

Table 4: Comparison of Five Nested Measurement Models*

MEASUREMENT	χ^2	Df	χ^2 Difference	RMSEA	CFI	GFI	AGFI
One factor model	2017.46	464	126.16**	0.089**	0.79	0.77	0.74
Two factor model	1891.30	433	1031.05**	0.090**	0.80	0.77	0.74
Three factor model	860.25	206	143.44**	0.087**	0.85	0.84	0.81
Four factor model	716.81	246	204.83**	0.068**	0.88	0.88	0.85
Five factor model	511.98	280		0.044**	0.94	0.91	0.89

* *N* =421. *df* =degrees of freedom; RMSEA= root mean square error of approximation; CFI =comparative fit index; GFI=Goodness of Fit Index; AGFI= Adjusted Goodness of Fit Index , ** p <0.05.

3.5. Comparison of the Original SERVQUAL and the Adapted SERVQUAL Scales in Higher Education

Second order CFA with the three-dimensional structure which was supported by Parasuraman et.al (1994), the original five-dimensional SERVQUAL scale and the adapted SERVQUAL scale is carried out. The results revealed that the original five dimensional SERVQUAL scale has a very good fit in higher education sector (Table 5). Besides, the adapted SERVQUAL scale pointed out good model fit indicating that the adapted SERVQUAL scale can be a good instrument to measure service quality in higher education (χ^2= 522.31, *df*= 285, CFI= 0.94, RMSEA=0.045). However, when the fit indices of three-dimensional SERVQUAL measurement scale are observed, it's seen that the model has a satisfactory fit but the chi-square difference test **does not** support that the original five-factor and three-factor models differ (χ^2_{dif} = 12.47; d.f.$_{dif}$ =24; p = 0.05) significantly since the chi-square difference does not exceed the critical value at p=0.05. Since the χ^2 value of original five-factor SERVQUAL scale is smaller and this scale has better fit indices, it can be concluded that the original five-factor SERVQUAL scale has a better model fit than the three-factor SERVQUAL scale.

In order to evaluate the strength of the fit of original five-factor model and adapted SERVQUAL model, the two models are compared according to the CMIN/df index showing that both models have the same level of model fit (CMIN/df =1.8) (Holmes-Smith, 2000). Moreover, expected cross-validation index (ECVI) and Akaike Information Criterion (AIC) index are intended for model comparisons where lower value indicate the superior model fit (Schumer and Lomax, 2004). Therefore, ECVI and AIC indices of models are compared. According to the results, original five-factor model was found to have a better model fit than three-factor and adapted SERVQUAL model ($ECVI_{five\text{-}factor}$=1.03; $ECVI_{three\text{-}factor}$ =1.08; $ECVI_{adapted}$=1.56; $AIC_{five\text{-}factor}$= 434.10; $AIC_{three\text{-}factor}$=452.57; $AIC_{adapted}$=654.31).

Table 5: The Fit Indices of the Five and Three Dimensional Models of SERVQUAL and Adapted SERVQUAL in Higher Education

MEASUREMENT	χ^2	df	CMIN /df	RMSEA	p	CFI	GFI	AGFI
Five-Dimensional SERVQUAL	334.10	181	1.8	0.45	0.000	0.96	0.93	0.91
Three-Dimensional SERVQUAL	346.57	157	2.2	0.054	0.000	0.94	0.92	0.90
Adapted SERVQUAL	522.31	285	1.8	0.045	0.000	0.94	0.91	0.89

4. CONCLUSION

SERVQUAL dimensions do not fit all services. Every service may require a separate SERVQUAL measurement scale which relate to specific features of that sector. This can bring new dimensions to the SERVQUAL measurement. Parasuraman, Berry and Zeithaml (1993, p.145) themselves propose the SERVQUAL items as the "basic 'skeleton' underlying service quality that can be supplemented with context specific items when necessary. For example, when a scale for tourism sector is developed, security, e-commerce facilities, entertainment, etc. dimensions can also affect service quality. Hence, the adapted SERVQUAL measurement model proposed in this study underlined the fact that there might be sector specific dimensions that are closely related to the nature of the service sector. The five-dimensional model of the adapted SERVQUAL scale exposed two new factors different than the original SERVQUAL dimensions. **Curriculum customization and campus facilities** and **Career facilities** are the new dimensions that are suggested due to the factor analysis conducted for higher education sector.

In this study, most of the dimensions of the original SERVQUAL model mixed together and loaded under the same factors except tangibility dimension. **Empathy and Assurance, Reliability and Responsiveness, Tangibility** are the three factors that are found in the factor analysis. Previous studies also validate the convergence of the dimensions within the original SERVQUAL model. The reason for this convergence may emerge from the similarity of the statements of different dimensions and the misinterpretation by the respondents. Moreover, some dimensions can be antecedents of others. The dimensionality problem of SERVQUAL measurement model that stems from the convergence of the dimensions in many studies which was also the case in this study, lead to the development of three-factor SERVQUAL model which was also supported by Parasuraman et.al, (1994). However, the CFA findings of this study concluded that the original five-factor SERVQUAL has better model fit.

The adapted scale has convergent and discriminant validity. Besides, the reliability coefficient is higher than the original scale. On the contrary, in spite of the fact that the adapted scale has a good model fit, the original five-dimensional SERVQUAL scale demonstrated better fit indices according to CFA. In conclusion, sector specific service quality measurements can be developed and used for different services however; in this study it is observed that the original five dimensional SERVQUAL scale is more appropriate to measure service quality in higher education sector. These findings and future studies supporting our conclusions are expected to contribute to service providers by diminishing the costly and time consuming efforts to develop a sector specific service quality measurement scale since SERVQUAL is an adequate scale for service quality appraisals.

This study was limited to a public university in a Business Faculty hence, the generalizability of the results would not be appropriate. Thus, it is suggested to develop SERVQUAL measurements in higher education and

test their factor structures both in public and private universities in future studies and in different faculties. In addition, similar studies are recommended to be conducted in different services to identify the suitability of SERVQUAL in different services by using confirmatory factor analysis.

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Appendix 1: New Added Items of the Adapted SERVQUAL Scale

N6	An excellent faculty has collaboration with business world
N8	An excellent faculty has campus facilities that fulfill the needs of the students
N9	An excellent faculty has high student selection criterion
N10	An excellent faculty helps students for career planning
N11	Students graduated from an excellent faculty have no difficulty in finding jobs
N20	Bookstores exist in an excellent faculty where students can buy course books
N22	In an excellent faculty, academic personnel takes the students' course load within the term into consideration while planning the courses
N23	An excellent faculty gives students the opportunity of determining their own course load by indicating the courses and their outlines in advance
N24	An excellent faculty gives students the opportunity to arrange their own curriculum within the term (add-drop opportunities)