Zones of Tolerance for Higher Education Services: A Diagnostic Model of Service Quality towards Student Services

Yükseköğretim Hizmetlerinde Tolerans Kuşağı: Öğrenci Hizmetleri ile İlgili Tanımlayıcı Hizmet Kalitesi Modeli

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Abstract

The present study describes the zone of tolerance for students' service expectations and determines the student satisfaction level for higher education institutes. It attempts to diagnose the service quality level of administrative units, such as services provided by the registrar, library, faculty/school offices, rector's office, dormitories, sports and health centre in a university setting. A conceptual model HEDZOT is presented in this study, and the results demonstrate that evaluation of services can be scaled according to different types of expectations—'desired' and 'adequate'—and that students use these two types of expectations as a comparison standard in evaluating higher education services. The findings reveal that students have a narrow zone of tolerance with regards to the services provided by higher education.

Keywords: Higher education, Service quality, Student satisfaction, Zone of tolerance

Öz

Bu çalışma, yükseköğretim kurumlarında öğrencilerin hizmet beklentileri ile ilgili tolerans kuşağını tespit etmekte ve öğrenci memnuniyetini ortaya koymaktadır. Araştırmada, yükseköğretim kurumlarında öğrenci işleri, kütüphane, fakülte/yüksekokul idareleri, rektörlük, yurtlar, spor ve sağlık merkezleri gibi idari birimler tarafından sağlanan hizmetlerin kalitesi tespit edilmeye çalışılmaktadır. Bu çalışmada HEDZOT başlıklı kavramsal bir model de önerilmiş olup, araştırma sonuçları öğrencilerin hizmet değerlendirilmesi aşamasında iki farklı çeşit beklentiyi – 'arzu edilen' ve 'en düşük kabul edilebilir' – dikkate aldıkları ve öğrencilerin yükseköğretim hizmetlerini değerlendirmede bu iki çeşit beklentiyi karşılaştırma yaparlarken standart olarak kullandıkları belirlenmiştir. Bulgulardan, öğrencilerin yükseköğretim hizmetleri ile ilgili dar tolerans kuşaklarına sahip oldukları da tespit edilmiştir.

Anahtar Sözcükler: Yükseköğretim, hizmet kalitesi, öğrenci memnuniyeti, Tolerans kuşağı.

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Introduction

Higher education is a fast growing service industry which is increasingly exposed to globalization processes on a daily basis (Mazzarol, 1998; Damme, 2001; O'Neil and Palmer, 2004). For example, in a recent article, Labi (2007) discusses how European higher education institutions are challenging the US in the quest for foreign students. In the competitive and quasi commercial global higher education market, service quality with reference to student satisfaction, is recognised as an important factor. In order to attract and retain students, education providers need to be actively involved in understanding students' expectations and perceptions of service quality. Higher education institutions have to adapt techniques for measuring quality and managing their services in efforts comparable to those of other service business sectors. Most of the commonly used conceptual frameworks for measuring service quality are based on marketing concepts (Gummesson, 1991). These frameworks measure quality through customer perceptions (Gronroos, 1984), with customer expectations having a substantial influence on these perceptions. It is argued that only criteria that are defined by customers count in measuring quality (Zeithaml *et al.*, 1990).

According to Hennig-Thurau *et al.* (2001, p. 332), educational services "fall into the field of services marketing". Educational services are directed towards people, and they are "people based" rather than "equipment based" (Thomas, 1978). Due to the unique characteristics of services, namely intangibility, heterogeneity, inseparability, and perishability (Parasuraman, 1986), service quality cannot be measured objectively (Patterson and Johnson, 1993). In the services literature, the focus is on perceived quality, which results from the comparison of customer service expectations with their perceptions of actual performance (Zeithaml *et al.*, 1990, p. 23).

During the last decade, quality initiatives in higher education have been the subject of numerous discussions among practitioners and academics. Moreover, the focus on service quality at various levels of higher education has become an imperative (Avdjieva and Wilson, 2002). Student satisfaction is often used to assess educational quality, where the ability to address strategic needs is of prime importance (Cheng, 1990). The conceptualization of service quality, its relationship to the satisfaction and value constructs, and methods of evaluation have been a central theme in the education sector during recent years (Soutar and McNeil, 1996; Oldfield and Baron, 2000). Measuring the quality of service in higher education is becoming increasingly important (Abdullah, 2006) and, in the field of higher education, students should be considered customers (Tony *et al.*, 1994).

Like many other service organizations, universities are now concerned with market share, productivity, return on investment and the quality of services offered to their customers. Service quality has a significant influence on students' positive word-of-mouth recommendations (Allen and Davis, 1991). Higher education institutions that are seeking to achieve success in international markets must undertake a range of activities designed to attract prospective students from around the world. It is one of the most significant and expensive decisions that many students and their families will have ever undertaken. There are significant differences between various target markets. Thus, in order to identify these differences, most universities have conducted research on the satisfaction level of their students. Curriculum, course content, teaching methods and the quality level of the lecturers have been questioned (Cannon and Sheth, 1994; Hampton, 1993; Brightman *et al.*, 1993). Indeed, understanding value from the customers' perspective can provide information useful to management for allocating resources and designing programs that promise better satisfied students (Seymour, 1992). As emphasized by Fitzgerald Bone (1995), this should elicit positive emotional responses from students with regard to their institution, and generate positive word of mouth. Recommendations of satisfied students, increases the importance of the institute and may help institute to attract new students. The higher education sector should, therefore, recognize the importance of service improvements in establishing a competitive advantage.

If service quality is to be improved, it must be reliably assessed and measured. According to the SERVQUAL model (Parasuraman *et al.*, 1988), service quality can be measured by identifying the gaps between customers' expectations of the service to be rendered and their perceptions of the actual service delivered.

Parasuraman *et al.* (1988) define service quality as 'a global judgment or attitude relating to the overall excellence or superiority of the service' and they conceptualize a customer's evaluation of overall service quality by applying Oliver's (1980) disconfirmation model, the gap between *expectations* and *perception* (gap model) of service performance levels. Furthermore, they propose that overall service quality performance may be determined by a measurement scale called "SERVQUAL" which uses five generic dimensions: Tangibles—the physical surroundings represented by objects (for example, interior design) and subjects (for example, the appearance of employees); Reliability—the service provider's ability to provide accurate and dependable services; Responsiveness—a firm's willingness to assist its customers by providing fast and efficient service ; Assurance—diverse features that instil confidence in customers (such as the firm's specific service knowledge, polite and trustworthy behaviour from employees); and Empathy—the service firm's readiness to provide each customer with personal service.

Harvey (2003, p. 4) notes that 'it is not always clear how views collected from students fit into institutional quality improvement policies and processes'. Moreover, establishing the conditions under which student feedback can give rise to improvement 'is not an easy task'. Indeed, Ford *et al.* (1993) point out that SERVQUAL might assess students' perceptions as to the quality of their educational institutions', but not *the education itself*. According to Oldfield and Baron (2000), student perceptions of service quality in higher education, particularly those elements not directly involved with content and delivery of course units, are researched using a performance-only adaptation of the SERVQUAL research instrument. This research, therefore, actually attempts to examine the service quality of administrative units in general rather than academic issues i.e. services provided by the registrar, library, faculty/school offices, rector's office, dormitories, sports, health center etc., as opposed to teaching, course content or curriculum.

Zeithaml *et al.* (1993) contend that the instrument provides a useful method for quantifying *desired service levels*, *minimum service levels*, and *customer perceptions of actual service*. Further, Parasuraman (2004) discussed the concept of 'zone of tolerance' of service as the difference between *desired service* (what the customer hopes to receive) and *adequate service* (what the customer will accept as sufficient). This concept has direct relevance to various service sectors in terms of assisting the firm to manage service more efficiently. The service level that a customer believes the firm will actually deliver is referred to as the *predicted service*. However, customers do not have a single 'ideal' level of expectation, but rather a range of expectations. Parasuraman (2004) refers to this range of expectations as the 'zone of tolerance', with 'desired service' at the top and 'adequate service' at the bottom of the scale. According to Parasuraman (2004), if the service delivered falls within the zone, customers will be satisfied and if the service is better than their desired service level, customers will perceive the service as exceptionally good, and be delighted. However, if the service falls below the zone of tolerance, customers will not only be unsatisfied but will feel cheated and take their custom elsewhere. The zone of tolerance provides a range within which customers are willing to accept variations in service delivery.

The nature and concept of the zone of tolerance

Barry and Parasuraman (1991) found that customers' service expectations exist at two levels, the *desired* level and the *adequate* level. The desired service level describes the service that the customer hopes to receive. This level constitutes a mix of what the customer believes "can be" and "should be" provided by the service provider. The adequate level denotes the level customers find acceptable. This level reflects customers' evaluation of what the service "will be", or in other words customers' *prediction of the level of* service. The difference between these two levels is termed the *zone of tolerance*, which is a range of service performance that the customer finds satisfactory.

A level below the zone of tolerance will lead to customer frustration, decrease customer loyalty, and, hence, dissatisfaction. A level above the tolerance zone will lead to delighted customers, strengthen loyalty, and, hence, satisfied customers.

Parasuraman *et al*. (1994) modified their SERVQUAL model to measure two aspects of service quality:

• The gap between *perceived service* and *desired service*—referred to as 'measure of service superiority' (MSS);

• The discrepancy between *perceived service* and *adequate service* (or minimum service)—referred to as 'measure of service adequacy' (MSA).

Parasuraman *et al*. (1994) suggest three alternative service-quality measurement formats. These are as follows:

• The first is a *three-column format* that generates separate ratings of desired, adequate, and perceived service using three identical, side-by-side scales. This requires computation of the 'perceived–desired difference' (for MSS) and the 'perceived–adequate difference' (for MSA). Its operationalization of service quality is thus similar to that of SERVQUAL—although it does not repeat the battery of items.

• The second is a *two-column format*. In contrast to SERVQUAL, this format generates direct ratings of the service-superiority gap (MSS) and the service-adequacy gap (MSA) using two identical scales.

• The third is a *one-column format*. This format also generates direct ratings of the service-superiority gap and the service-adequacy gap. However, the questionnaire is split into two parts—with Part I containing one set of scales (for MSS) and Part II containing the same set of scales (for MSA). Thus, this format involves repeating the battery of items (as in SERVQUAL).

The three-column format SERVQUAL is the most significant development by Parasuraman *et al*. (1994), and it is claimed that this can be used for managers for diagnostic purposes and affords the opportunity for using the perception items separately for prediction purposes. Despite the potential diagnostic value, there have been very few reported empirical studies using this instrument (Cavana *et al*., 2007).

Zeithaml *et al*. (1993) propose that customer expectation (as a comparison standard) can be considered through two perspectives: *narrow* and *broad*. According to the *narrow* perspective, customer expectation is a belief in the future performance of a product. According to the *broad* perspective, expectation is multidimensional and associated with different levels of performance. The authors then classify expectations into *desired* and *adequate.* They define *desired service* expectation as the level of service that customers hope to receive. This is a mixture of what customers believe the level of performance *can be* and *should be* (Zeithaml *et al*., 1993). They claim that this corresponds to customers' evaluation of service quality. The *adequate service* expectation is defined as the lowest level of performance that consumers will accept. The authors note that this level of expectation is comparable to minimum tolerable expectation. This is termed 'predictive expectation', and is associated with customer satisfaction. The area between desired service and adequate service is referred to as the *zone of tolerance*, and represents the range of service performance that customers will tolerate.

Zeithaml *et al*. (1993) also reported that "as conceptualised in the customer satisfaction/dissatisfaction literature, assessments of customer satisfaction results from a comparison of predicted service with perceived service. Predictive service, however, is not the comparison standard that customers use in service quality assessments. Instead, service quality assessments are a function of two other comparisons. Consistent with the services marketing literature, service quality assessments, called gap 5 in the gaps model of service quality (Parasuraman *et al*. 1985), involve comparisons with desired and adequate, rather than predicted service (p. 18)".

The inherent nature of services renders it difficult to ensure consistent service delivery across employees in the same firm, and even by the same service employee from day to day. The extent to which customers are willing to accept this variation is the zone of tolerance (Lovelock and Wirtz, 2007). Therefore, service performance that is above the minimum tolerable level will ensure satisfaction. More importantly, consumers will tolerate services that are equivalent to their minimum tolerable expectation. According to Zeithaml *et al*. (1993), consumers will tolerate service performance if it is equal to the 'adequate' service level. A zone of tolerance thus occurs when the service performance is between the desired expectation and the adequate expectation. Further, the 'bottom line' for satisfaction occurs when the perceived service performance is equal to the adequate service expectation.

In summary, assessment of *desired* and *adequate* expectations might be valuable in determining and monitoring service performance and student satisfaction. In addition, this information can be used as an internal benchmark to enhance the existing level of service quality. This study therefore draws on Zeithaml *et al*.'s (1993) model in developing its methodology.

Methodology

- *A conceptual model for measuring zone of tolerance in higher education*

The present study proposes a conceptual model "HEDZOT" for measuring the zone of tolerance in the higher education sector (see figure 1). This model expands upon previous work (described above) by incorporating two levels of expectations—desired and adequate. *Desired* expectations represent the level of service that a student hopes to receive from a university—a blend of what a student believes 'can be' and 'should be' offered. This differs from Parasuraman *et al*.'s (1988) conceptualization—which refers only to what the service 'should be'. *Adequate* expectations represent a lower level of expectation. They relate to what a university student considers to be an 'acceptable' level of performance. Desired expectations are deemed to remain relatively stable over time, whereas adequate performance expectations may vary with time. The difference between these two levels of service-quality expectation is deemed the *zone of tolerance* for higher education. The zone of tolerance may be defined as "the extent to which students recognize and are willing to accept heterogeneity" (Zeithaml *et al*., 1993, p. 6). In this model, student satisfaction results from a comparison between predicted service and perceived service. The *zone of tolerance* in the model is tested by using the dimensions of SERVQUAL.
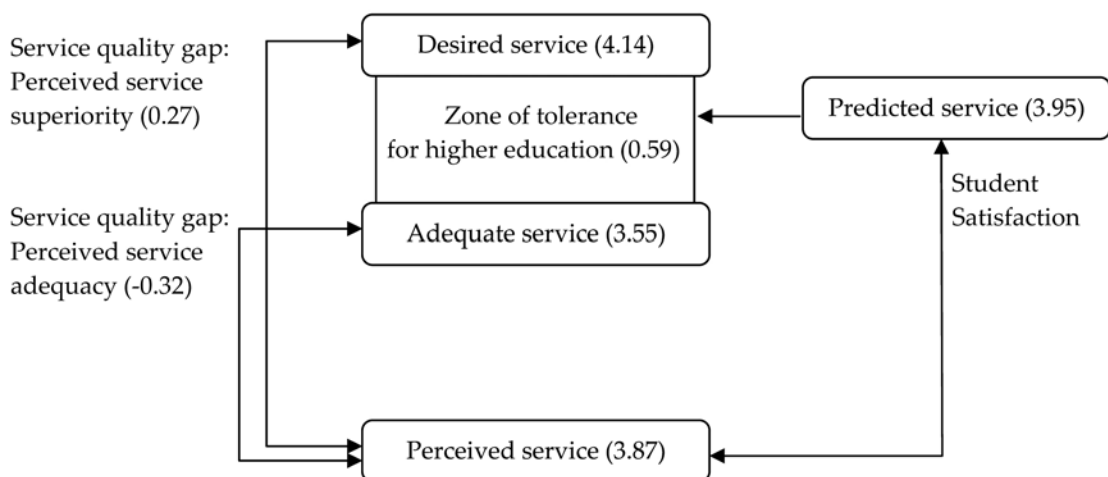
Note: Adapted from Zeithaml *et al*. (1993, p. 5). Mean values are presented in parenthesis.

Figure 1. Zone of Tolerance For Higher Education (HEDZOT)

Sampling

The sample used for the study consists of students studying at Eastern Mediterranean University, Famagusta, North Cyprus. The data was collected in May and June of 2008. The sample was selected on the basis of a non-probability convenience sampling technique (Aaker *et al.*, 1995). A total of 900 questionnaires were distributed to university students. Of these, 650 questionnaires were returned. In all, 577 questionnaires were found to be useful, which represents a 64.1% response rate from the original sample of 900.

Data collection

The questionnaire was based on service expectations ('adequate' and 'desired') and service perceptions, and followed a three-column format. The meaning of service expectations was briefly explained to all of the respondents prior to the questionnaire being distributed. There were 24 items in all—22 items for measuring service quality, based on the SERVQUAL scale (adapted from Parasuraman *et al.*, 1991), and 2 items for measuring customer satisfaction (see table 2 for items). A pilot test was conducted using 75 student responses. As a result of the pilot study, the instrument was reworded for measuring service quality and for the zone of tolerance within the higher education sector. This modified instrument is referred to as 'HEDZOT' in this study. A five-point Likert type scale (Likert, 1934) was used for data collection, with '1' being 'strongly disagree' and '5' being 'strongly agree'. The survey instrument was back-translated (Aulakh and Kotabe, 1993) for Turkish Cypriot national students. The survey instrument was applied in English to nationalities other than Turkish.

Data analysis

Descriptive measures such as means, standard deviations, and frequencies were calculated. University students' service expectations (adequate and desired) and service perceptions were measured using the HEDZOT instrument described above. Particular measures relevant to this study were defined as follows:

- The zone of tolerance for higher education was calculated as the difference between the desired service and the adequate service.

- The measure of service superiority (MSS) was calculated as the difference between the desired service and the perceived service.

- The measure of service adequacy (MSA) was defined as the difference between adequate service and perceived service.

HEDZOT dimensions were also calculated with a 'gap analysis' as the difference between perceptions and expectations using paired *t*-tests. Psychometric properties of the scale (such as reliability) were tested, and the dimensionality of the scale was confirmed through an exploratory factor analysis.

<div align="center">Results</div>

Dimensions of the model

The results of exploratory factor analysis demonstrated that the HEDZOT instrument failed to form its five assumed dimensions—tangibles, reliability, responsiveness, assurance, and empathy. HEDZOT was found to be two-dimensional—tangibles and intangibles. This is discussed further below.

Demographics

The results showed that most of the respondents were males (52.5%). The majority of the respondents were between the ages of 21 and 25 (86.1%). With respect to education, 95.1% of the respondents were the students of undergraduate programs. In terms of field of study, 13.3% of

the students were from the faculty of education. Most of the respondents were in their second year of university education (41.8%). In terms of academic achievement, 27.2% of the students had a CGPA of 2.00-2.49. In terms of respondents' nationality, 27.7% were Turkish Cypriots, and 72.3% were categorized as foreigners from various other countries (including Far East Asia, the Middle East, Europe and Africa).

Zone of tolerance for higher education (HEDZOT)

The results in table 1 demonstrate that the mean desired service level was higher than the mean adequate service level, and that the mean perceived service level was higher than the mean adequate service level. The respondents' perceived service (as received) was therefore within the zone of tolerance for higher education. When the width of zone of tolerance was examined, the results demonstrated a narrow zone of tolerance (see graph 1). Width of zone of tolerance is found to be less than 20% of the point-of-scale used (e.g. 5-point Likert scale). Perceived service level (predicted service) is found to be close to the desired service level, which reflects Zeithaml *et al.*'s (1993) proposition "the higher the level of predicted service, the higher the level of adequate service and narrower zone of tolerance" (p. 9). MSS is found to be positive and MSA is found to be negative within the zone of tolerance. The same relationship was found in terms of HEDZOT dimensions: tangibles and intangibles. It can therefore be concluded that the respondents had a narrow zone of tolerance on each dimension of HEDZOT. The mean of predicted service level was also higher than the mean of adequate service level, which explains student satisfaction in HEDZOT. The reliability (internal consistency) of each service level (expected and perceived) exceeded the suggested level of 0.70 (Nunnally, 1978), which suggests that the measures [were] free from random error and thus reliability coefficients (Cronbach alpha) estimate the amount of systematic variance (Peter, 1979). The high alpha values indicated good internal consistency among the items, and the high alpha value for the overall scale indicated that convergent validity was met (Parasuraman *et al.*, 1991). The results obtained in this study are therefore reliable.

Table 1.

Zone of Tolerance for Higher Education (HEDZOT)

|	Means	Standard deviation	Cronbach alpha
Desired service expectations	4.14	0.56	0.93
Tangibles	4.10	0.65	0.80
Intangibles	4.18	0.56	0.92
Adequate service expectations	3.55	0.51	0.91
Tangibles	3.50	0.62	0.74
Intangibles	3.60	0.50	0.89
Perceived service received	3.87	0.68	0.95
Tangibles	3.83	0.76	0.81
Intangibles	3.92	0.73	0.94
MSS[a]	0.27	0.69	0.94
Tangibles	0.27	0.77	0.78
Intangibles	0.26	0.69	0.93
MSA[b]	- 0.32	0.72	0.94
Tangibles	- 0.33	0.82	0.78
Intangibles	- 0.32	0.74	0.93
Zone of tolerance[c]:	0.59	0.52	0.91
Tangibles	0.60	0.62	0.70
Intangibles	0.58	0.51	0.89
Student satisfaction	3.95	0.99	0.90

Notes: [a]Measure of service superiority (desired service level – perceived service level)

[b]Measure of service adequacy (adequate service level – perceived service level)

[c]Desired service level – adequate service level

Distribution of respondents' values between expectations and perceptions

Table 2 demonstrates that respondents had relatively high expectation scores (mean => 4.20) regarding the tangibles and intangibles of HEDZOT dimensions. The following items were rated high: 'employees are neat in appearance, 'perform service right the first time', 'employees tell you exactly when services will be performed', 'employees give you prompt service', 'employees are always willing to help you', 'employees are consistently courteous', 'employees have the knowledge to answer your questions', and 'convenience of operating hours'. However, relatively low expectation scores (mean =< 4.12) were found for 'modern looking equipment', 'physical facilities are visually appealing', 'materials associated with service are visually appealing', 'employees are never too busy to respond to your requests', and 'employees give you personal attention'. This indicates that respondents were more sensitive about all the dimensions of HEDZOT. As shown in table 2, a relatively high respondent perception score (mean => 4.00) was found for 'safe transactions' and 'convenience of operating hours'. However, there was a relatively low perception score (mean =< 3.92) for 'modern looking equipment', 'physical facilities', 'employees are neat in appearance', 'materials associated with service are visually appealing', 'promises to do something by a certain time', 'shows a sincere interest in solving problems', 'provides its services at the time it promises to do so', 'error-free records', 'employees tell you exactly when services will be performed', 'employees are always willing to help you', 'employees are never too busy to respond to your requests', 'behaviour of employees instils confidence in students', 'individual attention', 'personal attention', 'best interest at heart', and 'understanding specific needs'.

Zone of tolerance for higher education
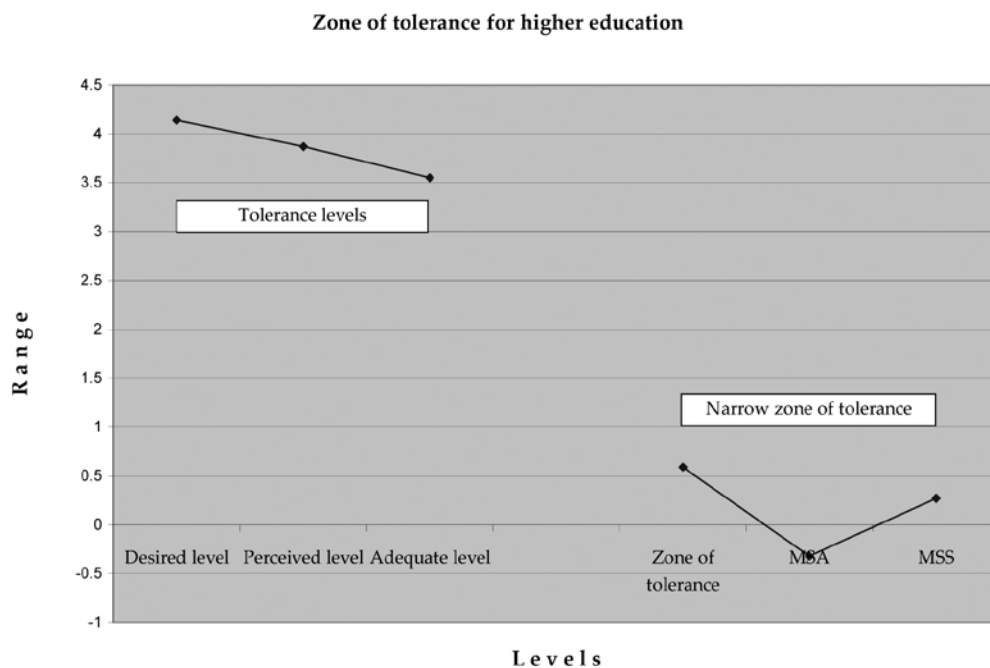
Graph 1. Zone of Tolerance For Higher Education

It should be noted that all the perception scores for all service items in this study were lower than the expectation scores—implying that all service items suffered from a service-quality shortfall. The largest gap scores (mean => -0.30) were found with respect to both the tangibles and intangibles of HEDZOT, such as 'employees are neat in appearance', 'materials associated with service are visually appealing', 'employees tell you exactly when services will be performed', 'employees give you prompt service', 'employees are always willing to help you', 'personal attention', and 'understanding specific needs'.

The paired-sample *t*-tests (between the respective expectation and perception means of all the items) showed that they were significantly different. The overall negative means differences indicate

Table 2.

Distribution of Respondents' Values Between Expectations and Perceptions

	Expectations means (SD)	Perceptions means (SD)	Gap means[a]	t-value
Tangibles				
EMU has modern looking equipment.	4.03(0.81)	3.81(0.87)	- 0.22	5.19*
EMU's physical facilities are visually appealing.	4.05(0.84)	3.80(0.89)	- 0.25	5.92*
EMU's employees have a neat appearance.	4.23(0.77)	3.93(0.99)	- 0.30	7.11*
Materials associated with the service are visually appealing at EMU.	4.12(0.85)	3.78(1.02)	- 0.34	8.10*
Intangibles				
When EMU promises to do something by a certain time, it does so.	4.13(0.90)	3.90(0.97)	- 0.23	5.39*
When you have a problem, EMU shows a sincere interest in solving it.	4.13(0.82)	3.89(1.03)	- 0.24	5.48*
EMU performs the service right the first time.	4.24(0.90)	3.98(1.06)	- 0.26	6.53*
EMU provides its services at the time it promises to do so.	4.19(0.85)	3.91(1.00)	- 0.28	6.54*
EMU insists on error-free records.	4.16(0.86)	3.92(1.04)	- 0.24	5.25*
Employees of EMU tell you exactly when services will be performed.	4.20(0.80)	3.85(1.04)	- 0.35	7.44*
Employees of EMU give you prompt service.	4.29(0.80)	3.93(1.04)	- 0.36	7.75*
Employees of EMU are always willing to help you.	4.20(0.81)	3.88(1.02)	- 0.32	6.42*
Employees of EMU are never too busy to respond to your requests.	4.12(0.86)	3.88(1.01)	- 0.24	5.24*
The behaviour of employees of EMU instils confidence in students.	4.14(0.83)	3.88(0.96)	- 0.26	5.64*
You feel safe in your transactions with EMU.	4.18(0.81)	4.07(0.91)	- 0.11	2.42*
Employees of EMU are consistently courteous with you.	4.24(0.83)	3.97(0.93)	- 0.27	6.37*
Employees of EMU have the knowledge to answer your questions.	4.21(0.82)	3.96(0.94)	- 0.25	5.94*
EMU gives you individual attention.	4.16(0.83)	3.88(1.02)	- 0.28	5.84*
EMU has operating hours convenient to all its students.	4.31(0.90)	4.11(0.97)	- 0.20	5.01*
EMU has employees who give you personal attention.	4.12(0.80)	3.78(0.91)	- 0.34	8.43*
EMU has your best interest at heart.	4.15(0.77)	3.88(0.95)	- 0.27	6.13*
Employees of EMU understand your specific needs.	4.14(0.86)	3.84(1.02)	- 0.30	6.27*
Student satisfaction				
I am happy with the service quality of EMU.		3.89(1.06)		
I am a satisfied student.		3.99(1.01)		

Notes: SD: Standard deviation, all the standard deviations are in parenthesis

[a]Gap mean is defined as perception mean – expectation mean

 *t-test two-tailed with probability < 0.05 and Paired Samples Correlations with probability < 0.05

that the expected service quality was not experienced by the respondents, and that the quality of service provided by the university did not meet expectations. Nevertheless, the shortfall did not seem to undermine the overall service quality and student satisfaction. The results in table 2 show just a reasonable score for customer satisfaction (mean = 3.89 and 3.99). It is therefore concluded that the dimensions of HEDZOT are a good indicator for assessing customer satisfaction for North Cyprus universities.

Results of exploratory factor analysis

The results in table 3 demonstrate that exploratory factor analysis using varimax rotation was employed to explore the dimensionality in the data set. The results failed to demonstrate HEDZOT's five distinct dimensions: tangibles, reliability, responsiveness, assurance, and empathy. The factor loadings of all these dimensions were found to be two-dimensional—tangibles and intangibles—had an eigenvalue greater than 1, explained 55.71% of variance, and all the factor loadings were found to be greater than 0.50 (Hair *et al.*, 1979)—indicating HEDZOT to be two-dimensional in this study. The Kaiser Meyer–Olkin statistic was found to be 0.95 and Bartlett's test of sphericity was 7779.26 ($p < 0.000$), which is an acceptable level as described by Norusis (1985).

Table 3.

Results of Exploratory Factor Analysis

Dimensions and items	Eigenvalue	% of variance	Cumulative variance %	Factor loadings	Cronbach alpha
Intangibles	11.13	50.60	50.60		$\alpha = 0.94$
Employees of EMU give you prompt service.				0.74	
Employees of EMU tell you exactly when services will be performed.				0.73	
Employees of EMU have the knowledge to answer your questions.				0.72	
Employees of EMU are never too busy to respond to your requests.				0.70	
EMU has operating hours convenient to all its students.				0.70	
EMU provides its services at the time it promises to do so.				0.68	
Employees of EMU are always willing to help you.				0.66	
EMU insists on error-free records.				0.65	
EMU gives you individual attention.				0.65	
Employees of EMU are consistently courteous with you.				0.65	
The behaviour of employees of EMU instils confidence in students.				0.65	
Employees of EMU understand your specific needs.				0.63	
EMU performs the service right the first time.				0.63	
You feel safe in your transactions with EMU.				0.63	
EMU has your best interest at heart.				0.62	
EMU has employees who give you personal attention.				0.61	
When you have a problem, EMU shows a sincere interest in solving it.				0.61	
When EMU promises to do something by a certain time, it does so.				0.55	
Tangibles	1.12	5.11	55.71		$\alpha = 0.81$
EMU's physical facilities are visually appealing.				0.78	
EMU has modern looking equipment.				0.76	
EMU's employees have a neat appearance.				0.73	
Materials associated with the service are visually appealing at EMU.				0.68	

Notes:
Kaiser Meyer - Olkin Measures of Sampling Adequacy: 0.95
Bartlett's Test of Sphericity: 7779.26   p<0.000
Principal component analyses with a varimax rotation
Overall reliability score: 0.95

The results in table 3 also demonstrate that the overall reliability of the scale had an alpha coefficient of 0.95—which is deemed acceptable (Churchill, 1979; Nunnally, 1978). The Cronbach alphas for tangibles and intangibles were found to be 0.81 and 0.94 respectively at the aggregate level—which exceeds the minimum standard 0.70 (Churchill, 1979, Nunnally, 1978).

Discussion

The importance of this study can be viewed from two dimensions: theoretical and practical. This study fills an important gap in the higher education service quality literature by proposing the HEDZOT model. The proposed model can be effectively used as a diagnostic tool in the higher education sector. The objective of this study was to describe the range of zone of tolerance for students' service expectations and to determine the level of students' satisfaction with higher education. The

findings demonstrate that the HEDZOT model proposed in the study is reliable. The concept of zone of tolerance helps practitioners to analyse the effectiveness of service quality and to identify problem areas that need improvement (Lo *et al*., 2002).

The measurement of a zone of tolerance is a reliable new method for determining service variations in higher education. The findings reveal that students have a narrow zone of tolerance—which indicates that these students are not likely to accept heterogeneity in the quality of the services provided by their university. The notion can be define as a narrow or broad perspective in zone of tolerance is related to its width. If the with of zone of tolerance is found to be less than 20% of the point-of-scale used, it should be considered 'a narrow zone of tolerance'. If the width is found greater than 60% of the point-of-scale used, it should be considered 'a broad zone of tolerance'. In the remaining case of the middle condition, the neutral zone of tolerance exists. These percentages are only suggestions and that other ranges and descriptions of wideness are possible.

The results also confirm that services can be evaluated according to two different types of expectations—desired and adequate. In other words, students use two different types of expectations (desired and adequate) as a standard of comparison in the evaluation of services. This finding confirms that expectations can be deemed to be antecedents of student satisfaction. The proposition by Ze ithaml *et al*. (1993) with respect to the use of 'desired expectation' and 'adequate expectation' as a comparison standard was supported by the results.

In terms of gap analysis, the findings reveal that the students' perceived a shortfall in the service quality provided by the university, implying that these students' expectations of service quality were not met with respect to either tangible or intangible services. Similar findings were drawn by Lam and Zhang (1998), Ekinci *et al*., (2003) and Kozak *et al*. (2003), Nadiri and Hussain (2005) in their studies. The overall evaluation of service quality in higher education was determined by both the tangibles and intangibles dimensions of HEDZOT model in this study.

In this study, a gap-analysis measurement scale is an indicator for measuring student satisfaction. As previously noted, some scholars have argued that measurement of expectations does not provide the information necessary for estimating service quality; they argue that a performance-only measure (such as SERVPERF) is a better predictor of service quality (Cronin and Taylor, 1992; Babakus and Boller, 1992; Boulding *et al*., 1993). In general, previous studies do suggest that a SERVPERF measurement is sufficient. However, it has been acknowledged that such an approach limits the explanatory power of service-quality measurement (Parasuraman *et al*., 1994) because assessment of desired and adequate expectations might be valuable in determining and monitoring service performance and student satisfaction. In addition, this information may be used as an internal benchmark to enhance the level of service quality. This study attempts to diagnose the service quality of administrative units such as the services provided by the registrar, library, faculty/school offices, rector's office, dormitories, sports center, and health center. The findings of this study are therefore important for practitioners in the higher education sector.

The results of this study have a number of practical implications for authorities (university management) seeking to identify the range of tolerance and level of student satisfaction in their respective institutes of higher education. Given that students are likely to become increasingly more demanding in terms of the level of service they consider to be adequate, institutes of higher education will find it challenging to fulfil all of the students' service quality requirements. Further, authorities should also pay attention to both the tangible and intangible components of their offer if they are to improve the quality of their services. Finally, the gap raises some issues about how authorities should monitor quality and prioritize resources to anticipate students' needs more effectively. Questions might also be asked about the extent to which authorities are really aware of the needs of their students and the methods they employ to assess the ongoing changing needs of students. Higher education authorities should ensure that employees are well trained and understand the level of service that the university expects to provide for their students. Ensuring that employees are well trained, and paying attention to other factors that are required for the

provision of a high level of service quality might incur increased costs, but will result in improved student satisfaction.

This research has certain limitations. Firstly, the sample in this study is small and is limited to students studying only at Eastern Mediterranean University. There are a total of six universities in North Cyprus, other universities should also be included in the sample for further research on service quality in higher education in North Cyprus. Students from other universities in North Cyprus may have different expectations from their respective institutions. Secondly, this study examined the influence of two factors (tangibles and intangibles) on students' zones of tolerance for higher education. As proposed by Zeithaml *et al*. (1993), there might be other factors that determine the width of the zone of tolerance—such as situational factors, advertising, price, repurchase intention, and word-of-mouth recommendation. Subsequent empirical research should address the impact of these factors on student expectations. Finally, many issues raised by Zeithaml *et al*. (1993) remain to be explored—for example, how marketing strategies can be designed to manage adequate service-level expectations, the role of predicted service in influencing how students evaluate service quality, and how the higher education sector can use the zone of tolerance concept to formulate marketing strategies effectively.Conclusion

This study provides higher education service quality researchers with useful guidelines for future research that may result in more rigorous theoretical and methodological processes. The terms 'student satisfaction' and 'quality' have been central to the philosophy of the higher education authority, and their importance continues with the promise of a renewed, foreseeable prosperity for the higher education of the future. Nevertheless, higher education research has been instrumental in assisting higher education authorities with valuable knowledge to assist them with their constant pursuit to gain competitive advantage. If a higher education institution is providing improved service quality, it results an increase in student satisfaction. Satisfied and happy students are likely to be motivated in their studies (Elliott and Shin, 2002), which result success and better career opportunities for them, eventually the business sector will demand more graduates from such institutions. Also, satisfied and happy students are likely to recommend their institutions to further students (Navarro *et al*., 2005), which result student retention and eventually attract new students. One of the important suggestions to practitioners based on present study using the HEDZOT scale (a modified version of SERVQUAL) is that higher education authorities should maintain service levels according to the students' desired expectations if they are to please them. In addition, the use of an expectation scale (incorporating 'gap theory') provides diagnostic information about the level of service performance from the students' perspective. The use of a zone-of-tolerance method provides useful information to higher education authorities for developing quality-improvement strategies and student recruitment strategies. Although this study was conducted in North Cyprus, we believe that universities in other countries will benefit from these research findings.

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