

Diagnosing university students' zone of tolerance from university library services

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ABSTRACT

Higher education is a dynamic fast growing service industry and every day it is more and more exposed to the globalization processes. Almost with every sector we face increased competition that also shows itself in higher education as well. Thus, measuring the quality of service in higher education is increasingly important and students should be considered as customers in the field of higher education. Many researchers suggest that for market orientation and differentiation, higher educational institutions should understand their customers, assess their needs, modify their offerings to meet those needs, and thereby boost customer satisfaction by delivering superior quality services. According to research findings service quality of library facilities is one of the most important factors that have a significant influence on students' overall satisfaction from their universities. The most widely known and discussed scale for measuring service quality -SERVQUAL- has not been successfully adapted to and validated in the library context. The LibQUAL+ scale has been validated in some of the developed cultures but not in other cultural settings. So, there is a significant gap in the literature regarding this area of research. The present study addresses this gap by applying the LibQUAL+ among 358 students of a state-owned university in Northern Cyprus. A conceptual model LIBZOT 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 library services. The findings reveal that students have a narrow zone of tolerance with regards to the services provided by libraries.

Keywords: Service quality; Student satisfaction; Zone of tolerance; Library services; Academic libraries

INTRODUCTION

One of the most important service industries that have emerged in the last decade is "International Higher Education" (Mazzarol 1998). Higher education is a dynamic and fast growing service industry and every day it is becoming more and more exposed to the globalization processes (Damme 2001; O'Neil and Palmer 2004). Together with the increase in number of higher education institutions all over the world, as Naudé and Ivy (1999) mentioned, both new and traditionally old universities are finding themselves in an unfamiliar environment, which requires competing for students. Service quality,

emphasizing student satisfaction, is a newly emerging field of concern. In order to attract students, meet their needs and retain them, higher education providers are actively involved in understanding students' expectations and perceptions of service quality. They need to employ techniques of measuring quality of their services just like their counterparts in the business sector. They need to familiar themselves with existing instruments that have been designed to measure service quality.

As Spreng and Mackoy (1996) mention service quality and customer satisfaction are undoubtedly the two core concepts that are the crux of the marketing theory and practice. In today's intensive competition, the key to sustainable competitive advantage lies in delivering high quality service that will in turn result in satisfied customers (Shemwell et al. 1998). The prominence of these two concepts is further manifested by the cornucopia of theoretical and empirical studies on the topic that have emanated over the past few years. Therefore, there is no even an iota of doubt concerning the importance of service quality and customer satisfaction as the ultimate goals of service providers. Like many other organizations, universities are now concerned with market share, productivity, return on investment and the quality of services offered to the customers. Especially the quality of service influences student recommendations to others (Allen and Davis 1991).

Shank, Walker, and Hayes (1995) suggested that higher education possesses the characteristics of a service industry. Also, Solomon (1985) argued that higher education can be termed as a pure service, because of the degree of person-to-person interaction. Since services are intangible, inseparable, heterogenous and perishable (Parasuraman 1986), measuring service quality cannot be achieved 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).

Galloway (1998) states that service quality is important to institutions of higher education for a number of reasons, including competitive advantages, satisfying government requirements, and meeting the public expectations. Within this context, Brigham (1994) and Dorweiler and Yakhou (1994) suggest how important it is for educational institutions to actively monitor the quality of the services they offer and to commit to continuous improvements in order to survive in the intense competition for highly desirable students and the revenue they generate. This becomes even more important in those universities that their budgets utilize a tuition-based model. Furthermore, it forces universities to adopt a market orientation strategy to take a proactive approach in dealing with the educational market realities and differentiate their offerings from those of their competitors.

During the last decade, quality initiatives have been the subject of an enormous amount of practitioner and academic discourse, and at various levels have found a gateway into higher education (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 of the education sector over recent years (Soutar and McNeil 1996; Oldfield and Baron 2000). Measuring the quality of service in higher education is increasingly important (Abdullah 2006) and students should be considered as customers in the field of higher education (Tony *et al.* 1994, Naudé and Ivy 1999; Guolla 1999; Elliot and Healy 2001). Higher education institutions 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 significant and expensive decision that many students and their families will have ever undertaken. Purchase takes place only once in a lifetime, with many costs other than money, like time, loss of potential income, psychic costs and etc. (Smith and Çavuşgil 1984; Burggraaf 1997).

Keegan and Davidson (2004) suggest that for market orientation and differentiation, higher educational institutions should understand their customers assess their needs, modify their offerings to meet those needs, and thereby boost customer satisfaction by delivering superior quality services. Price, Matzdorf, Smith, and Agahi (2003) reported on the impact of facilities on student choice of university. Price et al. (2003) surveyed a number of universities in the United Kingdom over two years in order to determine students' reasons for selecting a particular university. The average results for the two years were fairly similar. Among the top eight reasons, one of the main reasons was quality of library facilities. Nadiri (2007) also found out that service quality of library facilities is one of the most important factors that have a significant influence on students' overall satisfaction from their universities.

Thus, managers of higher education institutions need a standardized measure of library service quality in order to understand users' perceptions and improve library service quality that leads to better meet users' information needs. SERVQUAL scale is the most well known instrument for measuring service quality developed by Parasuraman, Zeithaml, and Berry (1985). However, various studies have proved clearly that the five SERVQUAL dimensions are not recoverable in the library context, and additional dimensions of quality not measured by SERVQUAL are necessary (Nitecki 1996; Andaleeb and Simmonds 1998; and Cook et al. 2000). The LibQUAL+ scale evolved out of the SERVQUAL model and the use of SERVQUAL in library settings (Thompson et al. 2007). The LibQUAL+ scale developed to measure perceptions of users library service quality consists of 22 core items under three dimensions; (a) service affect, (b) library as place and (c) information control. It has been used in different countries (USA, Canada, Australia, New Zealand, UK, France, Ireland, Netherland, Switzerland, Germany, Denmark, Finland, Norway, Sweden, Egypt, United Arab Emirates, South Africa), and adopted in twelve different languages (Thompson et al. 2007). It is believed that this scale provides useful information to improve library service quality (Cook 2002; Heath et al. 2004). The validity and reliability of this scale have been adequately demonstrated in developed countries but have not been adequately investigated in developing countries. The application of this scale is also limited in specific cultures. There is no study in the literature that shows that LibQUAL+ scale has been applied in Turkish language which is another gap in the literature. Thus, this scale need to be further tested in different languages and cultures.

Students do not have a single ideal level of expectation, rather, that have a range of expectations. This range of expectations as the zone of tolerance is extent to which customers are willing to accept within this variation (Lovelock and Wirtz 2007). 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. 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.

The present study explores the zone of tolerance and university students' satisfaction levels in university libraries in Northern Cyprus which is presented by local authorities as

“higher education island” with its’ six international universities and 48,000 students that stands for almost 20% of total population of country. The LibQUAL+ instrument was chosen for the present study to facilitate future replication (and hence validation) of the study.

This study is necessary, useful, and relevant because:

- a) it focuses on service quality in universities libraries as one of the most important factors that has a significant influence on students’ overall satisfaction with their universities (which have received little empirical attention in this geographical area);
- b) it tests the reliability and validity of ‘LibQUAL+ instrument’ by examining both students’ service quality expectations and perceptions in a developing/emerging market setting that has not been previously investigated in this regard;
- c) it is in the context of Northern Cyprus as both a higher education island and an emerging higher education market in the Mediterranean where quality of higher education institutions is a significant strategic issue for increasing the competitiveness; and
- d) it explores service quality in terms of the zone of tolerance in the higher education institutions’ library facilities (again a subject that has received little empirical attention in the literature).

Following this introduction, the paper presents a literature review of the relevant subject matter. The paper then presents the methodology of the study, including a conceptual model for measuring the zone of tolerance in libraries. The findings of the study are then presented, followed by a discussion of the implications and final conclusions.

CONCEPTUAL BACKGROUND OF THE STUDY

Students are regarded as the sole customer of the universities (Moore 1989; Conway et al. 1994; Nicholls et al. 1995; Naudé and Ivy 1999; Guolla 1999; Elliot and Healy 2001). This reality involves the customer in the production of the service. Universities have been advised to become more student-centred and adopt a consumer-oriented philosophy. The consumers determine the identification of a need, the conceptualization of a product or service as the “marketing concept” implies. According to this idea, the survival of the educational institution depends solely on the continuing satisfaction of its customers. Organizations try to retain the current customers, rather than seek to get new ones.

Viewing a student as a customer, Gyure and Arnold (2001) argue that through relationship-marketing tactics, students can be made to be satisfied. Thus, there is a need to develop systems where a continuous process that requires an in-depth understanding of students’ expectations, needs experiences and factors that influence them (Kotze and Plessis 2003). Elliot and Healy (2001) note that total student’s life influences his/her satisfaction. In addition, student life itself is affected by a number of factors; among them are the student’s academic, social, physical and spiritual environments. A student may be satisfied with his/her academic programme but he/she may not be satisfied with the other on campus facilities or supporting activities. As an evidence of satisfaction, the student’s willingness to recommend his/her former institution of learning to friends largely depends on his/her satisfaction with educational experience with the institution. For this reason, educational experience can be used as a predictor of student satisfaction. Thus, universities’ library services quality as one of the most important factor that has a

significant influence on students' overall satisfaction from their universities need to be further analyzed.

Service Quality Management at University Libraries

Together with intense competition in service industry, service quality has become a major differentiator and the most powerful competitive weapon that many leading service organizations possess (Berry et. al 1988). This is also true for higher education institutions. Service business success has been associated with the ability to deliver superior service (Gale 1990; Rudie and Wansley 1984). Delivering superior service by maintaining high quality is a prerequisite for success (Parasuraman et al. 1988). Checking and measuring service quality in service sectors has become so vital. Thus, managers of higher education institutions should continuously be measuring the quality of the services they are providing.

As White and Abels (1995) and Hernon and Altman (1996) claim, today's academic libraries are confronted with challenges on several fronts: Mega bookstores, online information providers, multimedia products, document delivery services, and other competitive sources of information are apparently threatening their role and even their survival. With evolving technological innovations and the variety and abundance of information that is becoming available to information users, competitive pressures will continue to intensify for academic libraries. Rising college costs and a student population that is becoming increasingly selective in choosing academic institutions also represent indirect threats to academic libraries. For example, various aspects of a college's offerings are factored into a student's decision to attend a particular institution. It is quite likely that when selecting a college, some students are influenced partially by the college's academic library and the quality of service the library provides. Consequently, academic libraries may have to adopt a more strategic orientation in which the creation and delivery of service satisfactions for their users play an important role. By doing so, academic libraries can also help their colleges meet their enrollment and student retention goals. In addition, each year new students enter the academic environment with varying library usage and information gathering skills. Student perceptions and expectations of service from academic libraries also vary, making it imperative to better understand and define specific student needs and to provide the type and level of service that meets them. Thus, Millson and Menon (1995) assert that one element of high quality service is the incorporation of users' personal needs and expectations into the development of programs and service. According to them, the continued success of a service organization such as an academic library depends on the organization's ability to modify its products and services to meet user needs. Similarly, Hernon and Calvert (1996) suggest that only customers justify the existence of a library. Nitecki (1996) also claims that the assessment of how well a library succeeds depends on the user as a judge of quality. It means that the relationship between the libraries and the clientele has always been a key to success.

Understanding how well the library fulfills its mission is of crucial importance. Historically, the quality of an academic library has been described in terms of its collection and measured by size of the library's holdings and various counts of its uses. In the last decade, the traditional mission of university libraries has been challenged on many fronts: changes in information technology; rising prices of print materials; increased accessibility of research materials via the Web; the appearance of commercial online data delivery services, and uncertain budget allocations. The changing focus of today's library requires greater understanding and responsiveness to the needs of customers or users. As a result,

a measure of library quality based solely on collections has become obsolete. Today, the success of a higher educational institution depends largely on the quality of its campus and ability to retain existing students (Bulgan 2002). Since, libraries are places at university campuses where students spend most of their times, it is therefore imperative to be able to measure service quality of libraries to identify how well provided services match customers' expectations (Cook and Thompson 2000).

In measuring libraries' service quality two most extensively use scales are SERVQUAL and LibQUAL+.

a) SERVQUAL

The most widely-used instrument for measuring service quality, SERVQUAL, has been developed by Zeithaml, Parasuraman, and Berry (1985). Parasuraman et al. (1985) validated the model in surveys of four different service settings (banking, credit card processing, repair and maintenance, and long distance telephone service). This model revolves around the idea that measurement of service quality is possible only through the eyes of the customer. Parasuraman et al. (1985) define expectations of service as what a customer believes excellent service companies in a particular service industry should offer and perceptions of service as the evaluation of the service offered by a particular firm in that industry. The set of criteria to cover the whole service experience from the customers' point of view include: access, communication, competence, credibility courtesy, reliability, responsiveness, security, tangibles, and understanding the customer.

Later, by conducting qualitative research and factor analysis of the difference between expectations and perceptions of customers, Parasuraman et al. (1991) developed their framework and conceptualize service quality to be a five-dimensional construct in 22-item Likert scale survey. These five factors are described as; *Reliability* - the ability to perform the promised service dependably and accurately, *Responsiveness* - the willingness to help customers and to provide prompt services, *Assurance* - the knowledge and courtesy of employees and their ability to convey trust and confidence, *Empathy* - the provision of caring, individualized attention to customers, and *Tangibles* - the appearance of physical facilities, equipment, personnel, and communication materials.

Kettinger and Lee (1995) believe that SERVQUAL stands as the most widely-used instrument for measurement and assessment of perceived service quality. Also Parasuraman et al. (1991) suggest that "SERVQUAL is most valuable when it is used periodically to track service quality trends". SERVQUAL, however, has not been without criticisms. Carman (1990), Babakus and Boller (1992), Babakus and Mangold (1992), Cronin and Taylor (1992), and Teas (1993a, 1993b) have criticized this model because of little theoretical or empirical evidence to support SERVQUAL gap theory as the basis for measuring service quality. Different versions of SERVQUAL continue to be critiqued and improved (Cronin and Taylor 1994; Parasuraman et al.1994; Tea, 1994).

Various studies have proved clearly that the five SERVQUAL dimensions are not identifiable in the library context, and additional dimensions of quality not measured by SERVQUAL are necessary for library services (Nitecki 1996; Andaleeb and Simmonds 1998; Cook et al. 2000). Research results also indicate that library participants believe that LibQUAL+ results have been useful in improving library service quality (Cook 2002; Heath et al. 2004). Thus, LibQUAL+ turns out to be an instrument intended to help librarians understand users' perceptions and it contributes to improve library service quality and better meet users' needs.

b) LibQUAL+

LibQUAL+ is an instrument that has been created to measure service quality of libraries and to help librarians determine whether they have met the expectations of their users or not. The Association of Research Libraries (ARL) with the cooperation of the Texas A&M University (TAMU) libraries have created this instrument. This scale is administered through the World Wide Web and it has been administered in research college and public libraries (Cook, Heath, Kyrillidou and Webster 2002; Cook, Heath, Thompson and Webster 2003; Snyder 2002). Because of the nature of being internet based, this instrument has been disseminated and used in many parts of the world in different languages (Kyrillidou, Cook and Thompson 2005). However, it has not been applied in Turkish language and its' validity and reliability has not been tested in Turkish culture which is a gap in the literature and one of the aims of this study to fill the gap in the literature.

LibQUAL+ has adopted many principles of SERVQUAL (Parasuraman et al. 1985, 1994). Parasuraman et al. (1990) claimed that "only customers judge quality; all other judgments are essentially irrelevant". Thus, it is obligatory for higher education institutions' management to closely monitor students' service quality perceptions from various services which have an impact on their overall satisfaction.

The instrument consists of 22 items, which represent three dimensions: affect of service, information control, and library as place. These items were developed through several iterations of quantitative studies involving a larger pool of 56 items. These 56 items were identified as a result of qualitative research interviews with students and faculty users at several different universities (Cook et al. 2001). The three dimensions that form the survey were described as:

- Affect of Service – measures how users want to interact with the modern library include, scope, timeliness and convenience, ease of navigation, modern equipment, and self reliance;
- Information Control – means to assess empathy, responsiveness, assurance and reliability of library employees; and
- Library as Place – measures the usefulness of the space, the symbolic value of the library and the library as a refuge for work or study.

The qualitative grounding of the LibQUAL+ and its' psychometric integrity has been documented in numerous studies (Cook and Heath 2001; Cook and Thompson 2001; Cook, Heath, and Thompson 2001a, 2001b; Cook, Heath and Thompson 2001). LibQUAL+ survey has become an administrative tool that assists libraries in gathering information about users' perceptions over time and to assess how well library is performing in providing users with access to information (Heinrichs, Sharkey and Lim 2006).

The users interpret LibQUAL+ results as scores on perceptions that compared against scores on what is reported to be minimally acceptable service, and what is reported to be desired service. As Cook et al. (2003) propose, this is called the zones of tolerance interpretation framework.

The Concept and Nature of Zone of Tolerance

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. Berry 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 scale and propose a technique 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 where three-column format 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). The three-column format 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).

Zeithaml et al. (1993) 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 (Figure 1). Zeithaml et al. (1993, p.18) 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)”

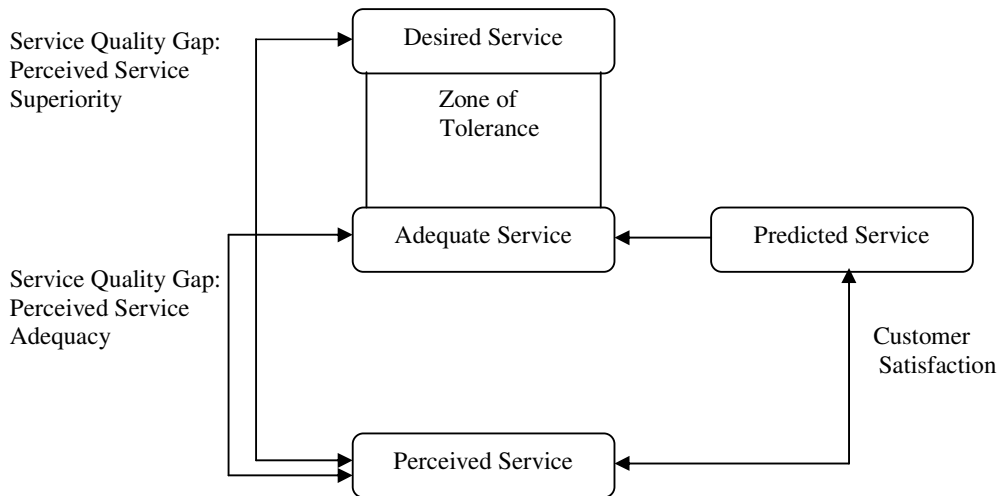


Figure 1: Customer Service Expectations

Source: Adopted from Zeithaml et al. (1993, p.5).

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.

Assessment of desired and adequate expectations might be valuable in determining and monitoring service performance and student satisfaction from library services. This information can be used as an internal benchmark to enhance the existing level of service quality.

METHODOLOGY

The data that have been used in this study were collected from the students at a state-owned trust university in North Cyprus during 2008. A combination of three-column

format of LibQUAL+ with seven-Likert scale was used as the instrument of this research. The questionnaire was anonymous without the inclusion of any identifying information. The original LibQUAL scale, which was in English, was forward-translated into Turkish (Aulakh and Kotabe 1993) in order to facilitate the process of comprehension for Turkish students, who are the majority of the students of the university. A pilot study with 21 respondents was carried out to pre-test the survey instrument. Results of reliability analysis showed that responses were consistent and it might be concluded that there was no problem of ambiguity or misunderstanding in questions. The questionnaires were distributed among 510 students of the university. The method of non-probabilistic convenience sampling has been applied within the students who were in the library in that period. Finally, 416 questionnaires have been returned. 58 questionnaires were eliminated from the sample due to inaccuracy, insufficiency, or carelessness in completing the survey. At the end, 358 questionnaires satisfactorily were found to be usable for analysis. This means that 70 percent of the distributed questionnaires were found to be usable

The original LibQUAL+ survey instrument with 22 items was used for this study. This questionnaire mainly consisted of three sections. Each item was to be graded three times. First, the respondents' minimum service level; second, respondents' desired service level; and the third, perceived performance. Respondents were required to either rate all three columns for each aspect or identify the item as not applicable (N/A). It was followed by second section of the questionnaire to identify the perceptions of respondents with eight questions on overall service quality, and overall satisfaction. A seven-point Likert scale was used as the grading criteria for both sections, where 1 represented the lowest possible grade and 7 corresponded to the highest possible grade. The third section was the demographic profile of each respondent. Data included gender, age, nationality, monthly family income, faculty/school they had attended, and the user group of the respondents.

The Statistical Products Services and Solutions (SPSS) for Microsoft Windows version 15.0 was employed to conduct the analyses. This study has clarified and explained various interesting points. The results are presented as follows.

FINDINGS

Demographic Breakdown of Respondents

The 66% of respondents were male while 34% was female. More than 50 % of respondents aged between 18 and 22. In addition, more than 40 % of respondents are experiencing their twenty's. Most of respondents were from Cyprus, Iran, Nigeria, and Turkey. It seems to be obvious that the number of Turkish students should be excessively more than the others. The university's, which the research was carried out, good image in Turkey and the fact that North Cyprus is geographically close to Turkey and since Turkish is the official language of North Cyprus seem to be the major reason to have this kind of distribution between students. Almost 65 % of respondents had family monthly income which is less than \$3000 USD. The distributions of respondents who contributed to this study are representing all the academic units in terms of number of students allocated at different faculties.

Validity and Reliability of LibQUAL+

In factor analysis principle component analysis has been used as the way of extraction. The rotation method that has been used was varimax with Kaiser Normalization. SPSS has suggested rotation converged in six iterations. The results of factor analysis demonstrated

that LibQUAL+ instrument satisfied to form its three assumed dimensions: affect of service, Information control, and library as place. The results in Table 1 demonstrate that the overall reliability of the scale had an alpha coefficient of 0.95 which is deemed acceptable (Churchill 1979; Nunnally 1978). Exploratory factor analysis using varimax rotation was employed to explore the dimensionality of the data set. The three factors – affect of service, information control, and library as place, has eigenvalues greater than 1. The cumulative variance explained by them was 60.61 percent, and all the factor loadings were found to be greater than 0.5 (Hair et al. 1998) that demonstrates three distinct dimensions in the study. The Kaiser Meyer-Olkin statistic was found to be 0.94 and Bartlett's test of sphericity value was 3075.42 ($p < 0.000$) which is an acceptable level as described by Norusis (1985). The Cronbach alphas for affect of service, information control, and library as place were found to be 0.89, 0.90, and 0.84 respectively at the aggregate level which exceeds the minimum standard 0.70 (Churchill 1979; Nunnally 1978).

Table 1: Results of Exploratory Factor Analysis

Dimension and Item	Eigenvalue	% of Variance	Cumulative Variance (%)	Cronbach Alpha	Factor Loading
Affect of Service	10.57	48.06	48.06	0.89	
Librarians who instil confidence in users					0.68
Giving users individual attention					0.69
Librarians who are consistently courteous					0.73
Readiness to respond to users' requests					0.57
Librarians who have the knowledge to answer users questions					0.71
Librarians who deal with users in a caring fashion					0.74
Librarians who understand the needs of their users					0.65
Willingness to help users					0.57
Dependability in handling users' service problems					0.58
Information Control	1.53	6.97	55.03	0.90	
Making electronic resources accessible from home or office					0.70
A library Web site enabling users to locate information on their own					0.64
The printed library materials that users need for their works					0.60
The electronic information resources users need					0.74
Modern equipment					0.67
Easy-to-use access tools that allow users to find things on their own					0.65
Making information easily accessible for independent use					0.63
Print and/or electronic journal collections users require for their works					0.66
Library as Place	1.23	5.58	60.61	0.84	
Library space that inspires study and learning					0.75
Quiet space for individual activities					0.77
A comfortable and inviting location					0.80
A getaway for study, learning or research					0.74
Community space for group learning and group study					0.50

Notes: Kaiser Meyer-Olkin measures of sampling adequacy: 0.94; Bartlett's Test of Sphericity: 3075.42, $p < 0.00$; Principle component analysis with a varimax rotation; Overall reliability score: 0.95

(a) Zone of Tolerance

The results in Table 2 demonstrate that the mean of desired service level was higher than the mean of adequate service level, and that the mean of perceived service level t for the dimension “affect of service” was higher than the mean of adequate service level. The customers’ perceived service (as received) for the dimension affect of service was just within the zone of tolerance for libraries. Additionally, the measurement of service superiority (MSS) mean scores for all the three dimensions were negative whereas the measurement of service adequacy (MSA) scores were negative for information control and library as place. Accurate measure of service quality is deemed critical and measuring only customers’ perceptions alone is not enough as this does not provide maximum diagnostic value and might provide misleading conclusions (Parasuraman et al., 1994). The zone of tolerance provides a more detailed insight as is reflected in Figure 2. When the zone of tolerance was examined with MSS and MSA, the results demonstrated a narrow zone of tolerance. Width of zone of tolerance is found to be less than 25% of the point-of-scale used (Likert scale). The same relationship was found in terms of all dimensions: affect of service, information control and library as place.

Table 2: Zone of Tolerance for Library Services (LibZOT)

	Mean	Standard Deviation	Cronbach Alpha
Adequate Service Expectations			
Affect of Service	4.25	1.18	0.91
Information Control	4.41	1.40	0.93
Library as Place	4.61	1.45	0.90
Desired Service Expectations			
Affect of Service	5.98	0.84	0.88
Information Control	6.05	1.00	0.91
Library as Place	6.16	1.06	0.86
Perceived Service Expectations			
Affect of Service	4.31	1.12	0.89
Information Control	4.29	1.25	0.90
Library as Place	4.49	1.33	0.84
Measure of Service Adequacy (MSA)			
Affect of Service	0.07	1.33	0.86
Information Control	-0.12	1.63	0.91
Library as Place	-0.12	1.66	0.87
Measure of Service Superiority (MSS)			
Affect of Service	-1.67	1.25	0.89
Information Control	-1.76	1.45	0.91
Library as Place	-1.67	1.52	0.86
Zone of Tolerance*			
Affect of Service	1.73	1.07	0.92
Information Control	1.64	1.19	0.92
Library as Place	1.55	1.26	0.90

Notes: *Desired Level – Adequate Level

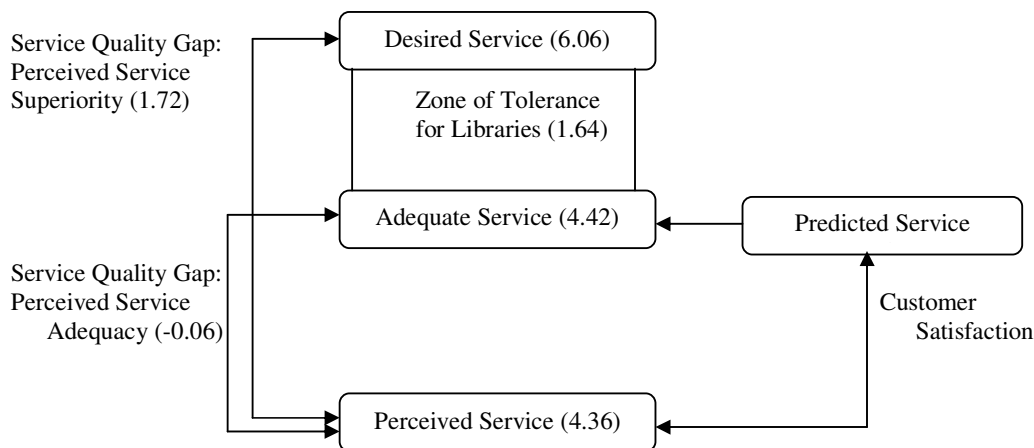


Figure 2: Zone of Tolerance for Libraries (LibZOT)

Note: Adapted from Zeithaml *et al.* (1993, p. 5). Mean values are presented in parenthesis.

It can therefore be concluded that the respondents had a narrow zone of tolerance on each dimension of LibZOT. Perceived service level is found to be close to the adequate service level. All MSS scores are found to be negative and MSA score for affect of service dimension is positive while it is negative for the rest of the dimensions. While perception of university students about affect of service dimension is within the zone of tolerance, which implies that students are satisfied with libraries performance on this dimension, for information control and library as place dimensions perception scores are lower than adequate service level. Attention should be focused on these dimensions that are clearly inadequate.

The reliability (internal consistency) of each service level (expected and perceived) exceeded the recommended level of 0.7 (Churchill 1979; Nunnally 1978), which suggests that the “measures [were] free from random error and thus reliability coefficients estimate the amount of symmetric variance’ (Churchill 1979, p. 4). The high alpha values indicated good internal consistency among the items, and 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.

(b) Distribution of LibZOT Values between Expectations and Perceptions

Table 3 demonstrates that customers had the highest expectation scores (M= 6.15) regarding library as place. However, relatively lower expectation scores (M= 6.04) were found for information control. The lowest expectation scores (M= 5.98) was related to affect of service. This indicates that customers were more sensitive about library as place. As shown in Table 3, relatively high customer perception scores (M= 4.48) was found for library as place. However, there was a relatively lower perception scores (M= 4.31) for affect of service. Finally the lowest customer perception scores (M= 4.28) was referred to information control.

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 score (mean = 1.77) were found with respect to information control. For the rest of dimensions the mean gaps were found as 1.67.

Table 3: Distribution of Respondents' Values between Expectations and Perceptions

	Expectation		Perception		Gap	t-value
	Mean	(SD)	Mean	(SD)	Mean	
Affect of Service						
Librarians who instil confidence in users	5.86	(1.20)	4.14	1.48	1.71	19.12*
Giving users individual attention	5.63	1.34	4.00	1.60	1.64	17.51*
Librarians who are consistently courteous	6.09	1.14	4.44	1.64	1.65	16.45*
Readiness to respond to users' requests	5.99	1.24	4.38	1.54	1.61	16.77*
Librarians who have the knowledge to answer users questions	6.18	1.15	4.56	1.57	1.62	17.31*
Librarians who deal with users in a caring fashion	5.94	1.17	4.17	1.49	1.76	19.39*
Librarians who understand the needs of their users	6.09	1.19	4.34	1.60	1.75	18.38*
Willingness to help users	6.09	1.20	4.37	1.68	1.73	17.44*
Dependability in handling users' service problems	5.95	1.17	4.40	1.52	1.55	16.89*
Information Control						
Making electronic resources accessible from home or office	6.03	1.40	3.95	1.82	2.08	18.56*
A library Web site enabling users to locate information on their own	6.11	1.31	4.30	1.74	1.81	17.63*
The printed library materials that users need for their works	5.99	1.30	4.34	1.64	1.65	16.81*
The electronic information resources users need	6.03	1.30	4.34	1.62	1.69	16.23*
Modern equipment	6.03	1.31	4.14	1.71	1.89	17.21*
Easy-to-use access tools that allow users to find things on their own	6.09	1.25	4.49	1.60	1.59	16.12*
Making information easily accessible for independent use	6.11	1.15	4.41	1.62	1.70	17.31*
Print and/or electronic journal collections users require for their works	5.97	1.28	4.25	1.66	1.72	18.32*
Library as Place						
Library space that inspires study and learning	6.22	1.20	4.53	1.67	1.68	17.14*
Quiet space for individual activities	6.21	1.24	4.35	1.74	1.86	17.80*
A comfortable and inviting location	6.17	1.33	4.67	1.64	1.50	15.14*
A getaway for study, learning or research	6.11	1.34	4.60	1.60	1.52	15.69*
Community space for group learning and group study	6.05	1.39	4.25	1.86	1.80	16.01*
Overall Satisfaction			4.51	1.46		

Notes: SD: Standard Deviation; 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

The paired sample *t*-tests (between the respective expectation and perception means of all the items) indicated in Table 3 showed that they were significantly different. The overall negative means differences indicate that an expected service quality was not experienced by the customers, and that service quality provided by the library did not meet expectations. Nevertheless, the shortfall did results in Table 3 show a reasonable score for customer satisfaction (mean = 4.51). It can therefore be concluded that the dimensions of

LibQUAL+ are a good predictor of customer satisfaction in the university's library. Students' zone of tolerance and perceptions for each dimension and overall are illustrated in Figure 3.

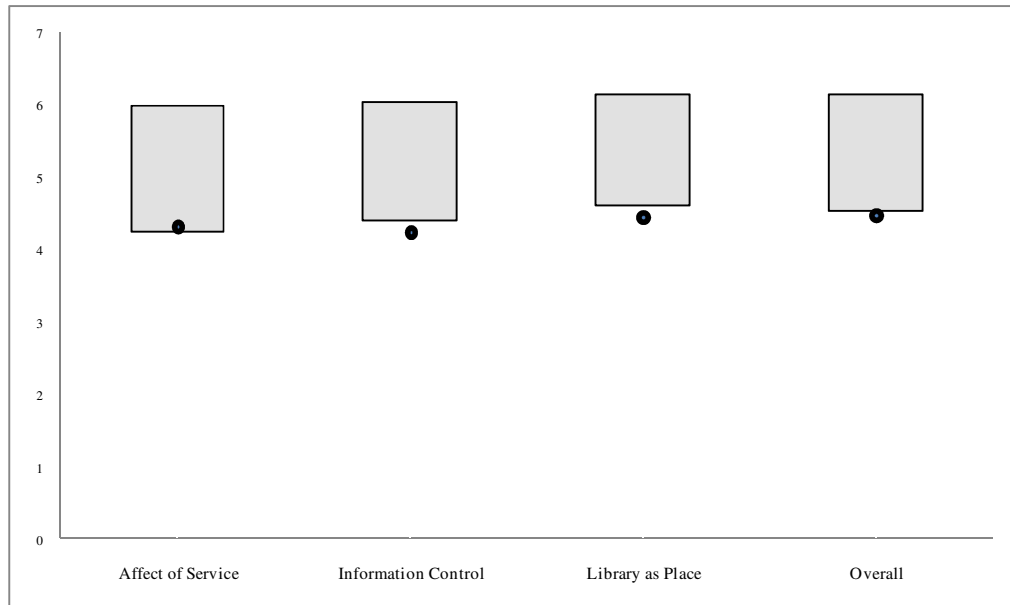


Figure 3: Illustration of Students' Zone of Tolerance and Perceptions for Each Dimension

DISCUSSION AND IMPLICATIONS

This study has important contributions to higher education literature. It fills an important gap in the higher education institutions' service quality literature by proposing the LibZOT model for library services. The proposed model can be effectively used as a diagnostic tool in the higher education sector to improve quality of library services that have significant effect on overall student satisfaction. One of the objectives 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 institutions' library services. The results demonstrate that the LibZOT model proposed in the study is applicable and viable. 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 has been empirically demonstrated to be a new method for determining service variations in higher education. The findings reveal that students have a narrow zone of tolerance about library services provided—which indicates that these students are not likely to accept heterogeneity in the quality of the services provided by their university's library services. The notion to define a narrow or broad perspective in zone of tolerance is related to its width. If the width of zone of tolerance is found to be less than 25% of point-of-scale used (e.g. Likert scale), it should be considered 'a narrow zone of tolerance', if the width of found greater, it should be considered 'a broad zone of tolerance'. The results 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 of Zeithaml 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 library, implying that these students' expectations of service quality were not met with respect to either affect of service, information control or library as a place dimensions. In number of studies similar findings were found by Lam and Zhang (1998), Ekinci et al. (2003) Kozak et al. (2003) and Nadiri and Hussain (2005). The overall evaluation of service quality in higher education library services were determined by the affect of service, information control and library as a place dimensions of LibZOT model in this study.

In this study, a gap-analysis measurement scale is an indicator for measuring student satisfaction. As indicated in Parasuraman et al. (1994) it might be valuable in determining and monitoring service performance and student satisfaction through assessment of desired and adequate expectations. Also, this information may be used as an internal benchmark to enhance the level of service quality. This study, which attempts to diagnose the quality of library services in higher education institutions', provide important insights for practitioners in the higher education sector on how to improve the overall satisfaction of university students by investing to library service quality.

Another important contribution of this study is validation of the LibQUAL scale implementation in both a different cultural setting (Northern Cyprus) and Turkish language which has not been applied before. The results of the study have demonstrated that the three dimensions of the original LibQUAL+ were identifiable in the Turkish language as well as in a different cultural setting of Northern Cyprus, and that the individual items were subsumed under the same dimensions as in the original scale.

This research has certain limitations and thus interpretation of its findings needs to be approached with caution. First, the sample in this study is small and is limited to students studying at only a state-owned trust university. Second, this study examined the influence of three factors (affect of service, information control and library as place) on customers' zones of tolerance for libraries. As proposed by Zeithaml et al. (1993), there may be other factors that determine the width of the zones like situational factors, reuse intent and word of mouth intent which are several factors likely to influence customers' zones of tolerance. Subsequent empirical research should look at the impact of these factors on customer expectations. Finally, many of the 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, what the role of predicted service is in influencing how consumers evaluate service quality, how the higher education sector can use the zone of tolerance concept to effectively formulate marketing strategies.

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