The HEDQUAL scale: A new measurement scale of service quality for MBA programs in higher education

G.E. Icli* and N.K. Anil
FEAS, Kirklareli University, Kirklareli, Turkey, Tel:: +90 288 246 17 09

*To whom all correspondence should be addressed
gulnuricli@yahoo.com

HEdPERF is the most developed scale in the literature to measure service quality in higher education. However, HEdPERF is designed to measure service quality at university level (macro level) as a generic measurement instrument. Students' expectations regarding education show differences as levels of education at universities (MBA, PhD) vary. Thus, in order to measure the quality of education at different levels, a new scale is required to meet the needs of that particular level (MBA). The purpose of this study was to develop and validate HEDQUAL, a new measurement scale of service quality specifically designed for MBA programs in the higher education sector.

A 36 item (Turkish) questionnaire on service quality in higher education was developed and tested for unidimensionality, reliability and validity using both exploratory and confirmatory factor analyses. A total of 317 usable questionnaires were collected with a return rate of 42%. SPSS 15 and LISREL 8 were used and exploratory and confirmatory factor analyses were applied. The recommended goodness-of-fit indices of the model were found to be within tolerable ranges, suggesting that the model provides a close fit to the data.

The study identified five factors namely academic quality, administrative service quality, library services quality, quality of providing career opportunities, and supporting services quality as the key dimensions of service quality.

This paper uses existing literature on services quality and MBA students' expectations and needs, and develops an instrument that provides insights into measuring service quality for MBA students in a university.

Introduction

The role of service quality in higher education has received increasing attention during last decades. In the services context, quality could be defined as a 'measure of how well the service level delivered matches the customer's expectations' (Lewis & Booms, 1983). Other authors state that perceived service quality reflects the opinion of the customer regarding the superiority or global excellence of a product or service (Zeithaml, 1988).

There is a considerable debate about the best way to define service quality in higher education (Becket & Brookes, 2006). Cheng and Tam (1997) pointed out that the "education quality is a rather vague and controversial concept". However, it is well recognized that "universities are increasingly finding themselves in an environment that is conducive to understanding the role and importance of service quality" (Shank, Walker, & Hayes, 1995). As a result of the difficulty in defining quality, its measurement has also turned to be a controversial issue. In terms of measurement methodologies, some authors have suggested that the service quality concept results from the comparison of performance perceptions with expectations (Parasuraman, Zeithaml, & Berry, 1988), while others argue that it is derived from perceptions of performance alone (Cronin & Taylor, 1992).

We have adapted a step-by-step approach inspired by Mitrega, Forkmann, Ramos & Henneberg *(*2012); Vanhala, Puumalainen and Blomqvist (2011); and Lages, Lages and Lages (2005) to develop the HEDQUAL scale (see Figure 1).

Phase 1

Definition and Comparison of Existing Scales

Quality is increasingly important for the higher education sector to understand customer expectations better and therefore the determinants of service quality. In higher education, the definition of a customer is quite different from the manufacturing or general services since groups such as students, employers, academic staff, the government and families are all customers of the same education system with a diversity of requirements (Abdullah, 2006a).

In the education sector, service quality has certain features due to the unique qualifications of the sector**.** In the higher education sector, students are the clients who are to be given a service and whose needs are to be met. Therefore, it is imperative for universities to identify and deliver what is important to students and how they will be satisfied. In higher education, student experience should be a key issue

of which performance indicators need to address. Thus, it becomes important to identify determinants or critical factors of service quality from the standpoint of students being the primary customers (Abdullah, 2006b).

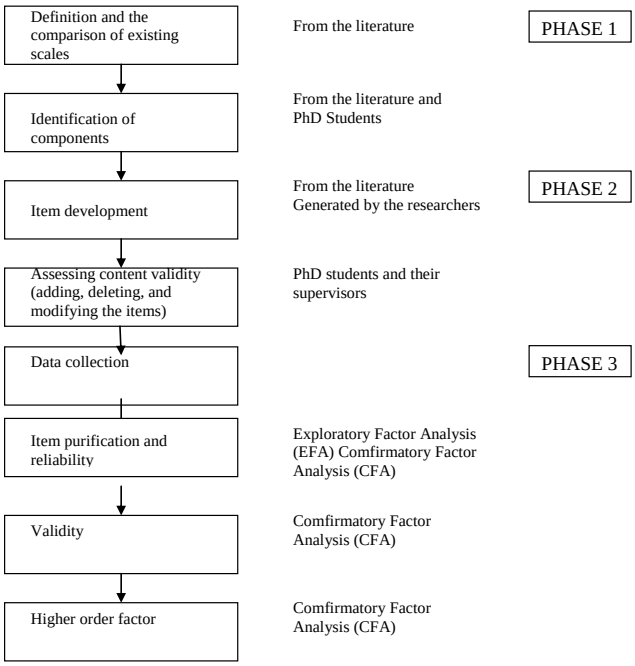

Figure 1: The development process

Education is one of the services that has the highest interaction between client and service provider, which requires development of a relationship that would not end at the time of completion of the program but is a lifetime relationship (Rojas-Méndez, Vasquez-Parraga, Kara & Cerda-Urrutia, 2009). In higher education, service quality deals with people, the time of delivery, intangibility (the learning process is too subtle to be measured) and difficulty in measuring successful output and productivity in a quality audit (Venkatraman, 2007).

Rojas-Méndez *et al*. (2009), expect that human interaction (e.g., student-program administrator, student-instructor, and student-secretary) plays a significant role in defining and assessing service quality in educational settings.

In order to meet student needs and to get their share from the highly competitive market, universities need to increase the number and quality of the services they offer and measure satisfaction, which is a result of quality. Therefore, it is important to clearly define the dimensions of the service quality leading to satisfaction in accordance with the field qualifications. In this way, they would be able to increase quality and thus satisfaction while eliminating dissatisfaction.

A review of the literature reveals that the most popular scales used to measure service quality (in higher education and other service sectors) are SERVQUAL – Service Quality (Parasuraman *et al.*, 1988) and SERVPERF – Service Performance (Cronin & Taylor, 1992). One of the most popular methods, called SERVQUAL, has its theoretical foundations in the gaps model and defines service quality in terms of the difference between customer expectations and performance perceptions on a number of 22 items; namely tangibles, reliability, responsiveness, assurance, and empathy. SERVPERF is a variant of the SERVQUAL scale, being based on the perception component alone. While SERVQUAL has also been directly applied to the higher education sector (Wright & O'Neill, 2002; Barnes, 2007), it has been significantly criticized and argued as insufficient because of not only the complexity in higher education but also the fact that SERVQUAL and SERVPERF were developed to measure service quality in general rather than measuring basic service quality in higher education.

Abdullah (2006a) regards the SERVPERF scale developed by Cronin and Taylor and the SERVQUAL scale developed by Zeithaml and Berry inadequate as they were both developed to measure the service quality for sectors other than education.

In view of that, Abdullah proposed HEdPERF (Higher Education PERFormance) as a new and more comprehensive performance-based measuring scale that attempts to capture the authentic determinants of service quality within the higher education sector (Abdullah, 2006b). This 41 item instrument aims to consider not only the academic components, but also aspects of the total service environment as experienced by the student. The author identified six dimensions of the service quality concept:

- **Non-academic aspects:** items that are essential to enable students to fulfill their study obligations, and related to duties carried out by non-academic staff;
- **Academic aspects:** responsibilities of academics,
- **Reputation**: importance of higher learning institutions in projecting a professional image;
- **Access:** includes issues as approachability, ease of contact, availability and convenience;
- **Programme issues:** importance of offering a wide ranging and reputable academic programs/ specializations with flexible structure and health services.
- **Understanding:** items related to understanding students' specific need in terms of counselling and health services.

A recent study by Brochado (2009) compares the performance of alternative measures of service quality in the higher education sector and concludes that SERVPERF and HEdPERF presented the best measurement capability but presented inconclusive results with respect to reliability and consistency. Awan (2010) has measured HEdPERF and SERVPERF combined in his study in which he aimed to find out the determinants of service quality. He measured the service quality in three dimensions as 'academic service

quality, managerial service quality and general service quality'.
Abdullah's study is important in that, it focuses on the education sector as opposed to other scales which measure service quality. However, HEdPERF is designed to capture the determinants of service quality in the higher education sector at a macro level. HEdPERF includes statements that are designed to measure services quality at a university level but it is not specific enough to capture MBA programs' characteristics. Therefore, it does not differentiate between different types of higher education programs that are in existence today.

HEdPERF developed by Abdullah (2006a) is quite general though it aims to determine service quality for educational purposes. In order to measure MBA level quality considering current student expectations and to test critical factors and/or determinants of the service quality through MBA students' viewpoints, HEDQUAL, a new service quality measurement, is developed and used in this study.

Different from the previous studies and the HEdPERF scale, newly developed HEDQUAL scale includes *library services quality*, *supportive services quality*, *quality of providing career opportunities* dimensions in order to evaluate the dimensions of the service quality at universities and to effectively plan their service process to measure service quality. Because, MBA students today expect advantages such as career opportunities, ability to work internationally, cooperation with other higher education institutes, information technologies, enabling the access and sharing of the information as learning environment, campus environments with social and cultural facilities enabling interaction, library services offering every kind of infrastructure for research, and easy access to these services from everywhere (home, workplaces, universities), however; current scales are lacking these dimensions.

The scale developed – HEDQUAL- is important as its only target is MBA students and the education sector and reduces the differences created by the SERVQUAL and SERVPERF scales, used for various service industries before.

The scale to be used should measure a student's expectations from the university and should consider as many various dimensions as possible in order to understand and evaluate the student's perception of quality about his/her institution as well as to determine the institution's position from certain aspects (e.g. to determine which dimension to focus on more). Only then would the scale be correctly guiding higher education institutions, especially the ones which offer MBA and PhD programs on administration. Only if higher education quality is achieved at all levels and aspects of education will it be possible to have qualified manpower.

Identifications and Components

Academic quality

Industrial societies have turned into information societies with the rapid developments in science and technology. Since today's most important factors of production are human power and information, the role of the universities in this process is very important. By increasing the level of information and skills of the society, the universities and academic staff have become highly valuable.

The most basic and the most important determinant of the satisfaction with universities is the academic quality of the staff and the lecturers of the university. Human interaction is very important in the education service provided in these institutions and in identifying satisfaction with the service. The interaction between students and academic staff affects the students' perceptions about the universities and the satisfaction with the university. According to Tang (2012), to the students who were the receiver of the education provision, internationally recognized qualifications; producing work-ready graduates; having quality lecturers; conducive learning environment were perceived as major characteristics of quality in higher education.

Tang and Zairi found that university staff members are more empowered than employees in other service industries, such as financial institutions, due to greater autonomy in communicating with and assisting students (Rojas-Méndez *et al.*, 2009).

It is crucial to establish an effective communication with students and to view them as a learning source and future colleagues to increase service quality at universities. In order to increase academic and learning quality, academics are expected to support student development from all aspects. Therefore, in order to achieve quality in MBA education, it is important to support flexible schedules, projects, individual and group work. The quality of universities today will increase with the help of monitoring the students closely, watching their global development, and revealing their talents, values and intellectual development (Khodayari & Khodayari, 2011).

To keep the academic quality high and thus to increase the satisfaction, lecturers who keep their ideals high, update their knowledge by following the developments, undertake research, produce new information and use this information to produce new scientists and researchers that are needed. The instructors contribute to the world of science by publishing scientific articles and carrying out research (facilities). It will thus be possible to increase satisfaction and loyalty of the students at the university by interacting well with the students who are willing to undertake research in order to improve themselves (Thomas, 2011).

In the studies related to academic quality, academics have been studied as the staff who are mostly interacting with the students and it has been observed that the interaction of the academics with the students has been very useful in the satisfaction about the university. The communication skills and friendly approach of the academics are expressed as the most important determinants with respect to academic quality (Tsinidou, Gerogiannis & Fitsilis, 2010). As the

trust of the students in the academic staff and their satisfaction experiences with them increase, their satisfaction about the university increases (Tuzun & Devrani, 2008).

In the studies made, student centered attitude (valuing the students, positive approach etc.) is expressed to be an important indicator (Elliott & Healy, 2001). Al-Alak (2006) expresses the fact that it is important for university employees to have professional/academic appearance with an academic manner to make students feel satisfied. He also states that well-groomed and educated employees, who also show signs of understanding and empathy toward students, project a sense of confidence to the students. Similarly, Butt and Rehman (2010) have concluded that the most important factor in student satisfaction is the fact that the academicians are experts in their fields. The feedback from lecturers, good access to lecturers and quality of teaching are perceived to be the most important variables influencing student satisfaction (Thomas, 2011).

Administrative services quality

A logical and transparent understanding of administration is an important factor influencing satisfaction and academic development. According to Kitchroen (2004), the first exposure of the student to the university is through the admission and registrar's services; so providing high quality service to students contributes to the positive assessment of the university. The administrative staff needs to be able to service rapidly, friendly, have specific working hours and be able to guide the students (Arena, Arnaboldi & Azzone, 2013). Trained administrative staff, who can provide students with thorough information, needs to be employed. Tsinidou *et al.*, (2010) have determined that the initial desire of the students is to be guided properly by the administrative staff and their advice. It has been shown that administrative services quality, though to a lesser extent than factors that are directly related to pedagogic implementation, does act as a predictor of student satisfaction (Kuo & Ye, 2009). All students, whatever their experience, demand high quality administrative support as well as high quality teaching (Wiers-Jenssen, Stensaker & Grogaard, 2002). Moreover, "Contact personnel" has been found as the most influencing factor in student's evaluation of service quality (Sohail & Shaikh, 2004). Administrative staff must be client centered or client focused and provide effective communication. In short, communication needs to be a pleasurable experience in which trained staff adopt a friendly, helpful attitude and provide a welcoming environment. Staff needs to be skilled problem solvers and provide acceptable, justifiable responses (Shanahan & Gerber, 2004).

Supportive services quality

The instructor and the places where the students are educated need to be well-equipped (classes, computer labs, library, even canteens, etc). Information technologies enable the access and sharing of the information as learning environment. Possibilities such as lecture software, computer based education, distance learning, video conference, internet based education and internet provide a rich learning environment in terms of the student's learning ability and the academician's teaching activity. Especially university libraries should be properly funded to acquire adequate size of information sources in response to increased students enrolment, introduction of new courses, establishment of more academic departments, faculties and colleges, and the recruitment of more academic and administrative staff (Ugah & Chilaka, 2011).

In order to increase educational productivity, it is important to take advantage of improved technologies in various settings (classes, computer labs, library, even canteens, etc). Academics enable lifelong learning through these opportunities, materials and means. Communication between students and academics grows stronger, students become more motivated and they enjoy the courses. Integrating facilities such as course software, computer assisted-education, distance learning, video-conferencing, Internet-based education and the Internet to the courses and curriculum would provide a much more productive learning environment both for the students and academicians. Online instructions help students search for the needed information and web-based service to provide easy access to a well-organized collection of information sources are important because these sources minimize customer time and effort and search process becomes more efficient (Kiran & Diljit, 2012; Lane *et al.*, 2012).

The students not only demand the classroom environment to be convenient but also demand the existence of a campus environment where they can utilize amenable social and cultural facilities. Thomas (2011) has found that the institutions should realize the importance of a range of support services (including placement support, hostel, and a canteen) in increasing student satisfaction. The students expect quality accommodation and food to be made available in the campus at reasonable cost; food and accommodation are rated as important factors influencing student satisfaction. Nadiri and Mayboudi (2010) state that the success of a higher educational institution depends largely on the quality of its campus facilities and ability to retain existing students.

Library services quality

Some important factors in determining the satisfaction indicator for the university include rich printed and electronic sources in the university library, class, workshop and laboratory etc, a sufficient and well maintained education environment and a university with social, cultural and sports facilities and infrastructural possibilities.

The infrastructural facilities like a computer center and library are also very important; most management courses require the constant use of computers, the internet and software applications. The presence of modern and adequate computers and library facilities enhances the satisfaction levels of the students (Arambewela, Hall, & Zuhair, 2005).

Similarly, Tsinidou *et al.,* (2010) state that students consider the "availability of books and periodicals" more importantly. The second criterion is the "ease of the borrowing process" followed closely by "a friendly service" and "operating hours".

Quality of providing career opportunities

The students, by specializing in the education they take, have an expectation to present themselves more easily. The quicker the graduates find a job the better the universities are accepted. Career centre/counseling is more important to the upper-level students, who are afraid to face the future without the prospect of a job (Lau, 2003).

In a survey conducted using a group of graduates in Canada, the most crucial criteria in evaluating MBA programs was determined as: career possibilities, getting promotion, and the possibilities of working internationally etc. (Heslop & Nadeau, 2010). Arambewela *et al.*, (2005) state that career opportunities are very influential on the students and they also mention that the statistics about the students with prominent careers and employment figures need to be pronounced. Finally staff needs to provide career advice and facilitate the students' academic pathway, from enquiry through the graduation stages and beyond (Shanahan & Gerber, 2004).

Phase 2

Measures

As Hinkin (1998) notes, researchers may use two basic approaches to item development: deductive (logical partitioning) and inductive approach (grouping). In this scale development, deductive approach was applied. A 36 item (Turkish) questionnaire was adapted from Heslop and Nadeau (2010), Nesset and Helgesen (2009), Tsinidou *et al.* (2010), and Rojas-Méndez *et al.* (2009). Moreover, the authors added several items such as the availability of an e-library and online journal membership to library services quality; necessary equipment for the classrooms (computer, digital projector etc) to supportive services quality; an effective career center and provide better career opportunities compared with other universities to quality of providing career opportunities. Drolet and Morrison (2001) argued that "shorter scales reduce monotony, costs, and response bias, and more particularly "an increase in the number of items encourages inappropriate response behavior and gives rise to positively correlated error term across items within respondents." Thus, it was aimed to keep the questionnaire as short as possible to save time and to get more cooperation of the respondents. Back to back translation method for measures was used. Academic quality, administrative services quality, library services quality, supportive services quality, and quality of providing career opportunities were measured on a five-point Likert-type scale with the following values: 1 = strongly disagree, 3 = neutral, and 5 = strongly agree. A pilot study on 15 MBA students revealed no problems in understanding of the questions.

Demographic characteristics of students included the gender, age, income, job status, type of MBA (with thesis or not), and scholarship.

Assessing Face and Content Validity

Face validity is "Post hoc evidence of content validity" while content validity is "A priori evidence that the items are a good representation of the construct (from expert judges)" (Rossiter, 2002: 311). Hinkin (1995) also asserts that content validity is the primary concern in item generation and it must be built into the measure through the development of items. The generated items were then submitted to 5 volunteer advisors of MBA students who participated the pilot survey in order to assess its content validity (Negra & Mzoughi, 2012). Following DeVellis' (2003) recommendation, the volunteer professors checked the scale items for ambiguity, clarity, triviality, sensible construction and redundancy. Given that the questionnaire had been appropriately designed through a comprehensive review of relevant literature then fined-tuned based on the suggestions from various experts, both the face and content validity of the instrument were ensured (Abdullah, 2006a).

Phase 3

Data Collection

The questionnaire was administered to MBA students by research assistants of state and foundation (private) owned universities located in Istanbul-the biggest city in Turkey. A total of 24 universities with MBA and PhD program in business administration out of 39 universities were targeted related to the aim of the study. Five state-owned universities and 13 foundation universities were selected since they had both MBA and PhD programs in business administration. Other universities were neglected due to the fact that either they had no PhD program or they did not have an institute of social sciences. All targeted state-owned universities and only 6 out of 13 foundation universities agreed to participate in the survey. A convenience sampling method was used. A total of 750 questionnaires were sent to universities. In total, 317 usable questionnaires were collected with the return rate of 42%.

Non-response bias

Non-response bias was tested by assessing the differences between the early and late respondents with regard to the means of all the variables for both samples (Armstrong & Overton, 1977). Early respondents were defined as the first 55% of the returned questionnaires, and the last 45% were considered late respondents. These proportions approximate the actual way in which questionnaires were returned. No significant differences between the early and late respondents were found, suggesting that response bias was not a significant problem in this study.

Demographic Characteristics of Respondents

Table 1 gives the demographic characteristics of respondents.

Table 1: Demographic characteristics of respondents

Variables	Frequencies	Percentage
Age		
<22	13	4.1
22-25	144	45.4
26-29	105	33.1
30-33	27	8.5
34+	28	8.8
Gender		
male	156	49.2
female	161	50.8
Job Status		
lecturer	6	1.9
private sector(not university)	164	51.7
public sector(not university)	30	9.5
unemployed	117	36.9
Income (TL)		
500-1000	91	28.7
1001-1500	54	17.0
1501-2000	62	19.6
2001-2500	41	12.9
2501+	69	21.8
Type of Education		
day	195	61.5
night	122	38.5
Type of MBA		
with thesis	113	35.6
without thesis	204	64.4
Scholarship Granted		
yes	38	12.0
no	279	88.0
Total 317 students. No missing.		

The descriptive analysis of demographic characteristics of the respondents was as follows: In the gender distribution, females had 50.8 % and males had 49.2%. 82.6% of the respondents were under 30 years old. Only 8.8% of those surveyed were older than 34 years. 51.7% were employed in the private sector while 36.9% were unemployed. 28.7% of the respondents were living with less than 1,000 TL which was almost equal to USD 550 per month. 21.8% were earning more than 2,500 TL which was almost equal to USD 1,373 per month. Most of the students were enrolled in the day type of education whereas 38.5% were enrolled in night classes. More than half of the students were enrolled in an MBA without thesis program with 64.4%. A minority, 12%, was granted a scholarship.

Purification: Exploratory Factor Analysis (EFA)

EFA assesses the construct validity during the initial development of an instrument (Worthington & Whittaker, 2006). A series of principal component analyses with varimax rotation were performed. Items that had a factor loading below 0.50 (i.e. item no. 1, 2, 8, 10, 13, 28) were eliminated from the scale after each factor analysis, until satisfactory psychometrics properties were achieved (Negra & Mzoughi, 2012). Following their approach, items were retained only if

- they loaded 0.50 or more on a factor and
- they did not load more than 0.50 on two factor.

Analyses were progressively re-run after item deletion to ensure the integrity of factor structure (Worthington and Whittaker, 2006). Overall, 26 items were obtained while 10 items were eliminated (Table 2).

Table 2: Deleted items and reason for deletion

Deleted items	Reason for deletion
1- Highly supported research activities	Factor loading <.50
2- Having highly experienced academicians.	Load more than 0.50 on two factors
6- Wide variety of courses.	
7- Can study in specialization of interest	
8- Develop new ways of thinking	
10- Learn both theory and practice	
11- Improvement in both oral/written communication	Factor loading <.50
13- Availability of exchange programs with other institutes	
28- Ease of access to campus	
32- Sufficient social and cultural activities.	

Table 3: Results of exploratory factor analysis

Factors and items	Factor loading	Eigen value	Variance explained (%)
Administrative services quality		10.514	40.439
15- Rapid service.	.810		
19- Availability of information material.	.800		
21- Friendliness.	.792		
16- Timely notification to students regarding schedule changes and/or cancellations new decisions, activities etc.	.785		
17- Clear guidelines.	.759		
18- Promise keeping.	.727		
14- Having enough knowledge about systems and procedures.	.725		
20- Sufficient working hours	.713		
22- Easily accessible administrative personnel. (phone, email)	.664		
Library services quality		2.946	11.330
23- Availability of textbooks and journals.	.834		
24- Availability of e-library and online journal membership**.**	.830		
25- Easy borrowing process.	.830		
26- Appropriate working hours. (Long working hours).	.777		
27- Friendliness.	.722		
Quality of providing career opportunities		1.808	6.954
35- Finding a job easily and quickly	.812		
34- Good career after graduation.	.806		
36- Provide better career opportunities compared with other universities.	.730		
33- Effective career center.	.614		
9- Providing knowledge which contributes to finding a job	.608		
Academic quality		1.324	5.091
3- Opportunity of having a good communication with academicians.	.788		
4- Positive attitudes/behaviors towards all students.	.695		
5- High academic support towards students from academicians.	.660		
12- Flexible curriculum.	.583		
Supportive services quality		1.175	4.520
30- Necessary equipment in the classrooms (computer, digital projector etc)	.806		
29- Size of the classrooms, laboratories	.783		
31- Catering services and cafes**.**	.671		
KMO: .927; Bartlett's Test of Sphericity: 5479.405; df:325; Sig. : .000; Cumulative Variance explained: 68.335%			
Extraction Method: Principal Component Analysis; Rotation Method: Varimax with Kaiser Normalization.; Rotation converged in 6 iterations.			

As shown in Table 3, five underlying dimensions were derived from the factor analysis as “Administrative services quality”, “Library services quality”, “Quality of providing career opportunities”, “Academic quality”, and “Supportive services quality”. Bartlett's test of sphericity with a value of 5479.405 ($p < 0.001$) and Kaiser–Meyer–Olkin statistics of 0.93 indicate that the data seemed suitable to identify factor dimensions. The five factors also explained 68.34% of the variance of the sample data.

Confirmatory factor analysis

It is recommended to perform confirmatory factor analysis (CFA) when seeking to validate new assessment instruments following exploratory factor analysis (EFA) (DeVellis, 2003; Worthington & Whittaker, 2006). Moreover, Steenkamp and Van Trijp (1991) suggest that CFA proposes a better estimate of reliability than coefficient alpha. Likewise, Styles (1998) indicates that while coefficient alpha assumes that different indicators have equal factor loadings (k) and error variances (d), CFA takes into account the differences among the existing indicators.. Therefore, in this study, after the EFA, CFA was applied in order to verify the dimensionality and reliability and two CFA proceeded on the basis of the second-order. Table 4 gives the CFA results for universities.

Table 4: Results of confirmatory factor analysis

Variables	Factor loading	t-value	α/ρvc(n)/ρ
Academic quality			.78/.50/.80
Opportunity of having a good communication with academicians.	0.80	15.83	
Positive attitudes/behaviors towards all students.	0.76	14.82	
High academic support towards students from academicians.	0.73	13.98	
Flexible curriculum.	0.50	8.77	
Administrative services quality			
Having enough knowledge about systems and procedures.	0.77	15.84	
Rapid service.	0.80	16.83	
Timely notification to students regarding schedule changes and/or cancellations new decisions, activities etc.	0.82	17.60	
Clear guidelines.	0.84	18.09	.93/.59/.93
Promise keeping.	0.81	17.35	
Availability of information material	0.83	17.88	
Sufficient working hours	0.64	12.53	
Friendliness	0.77	15.96	
Easily accessible administrative personnel. (phone, email)	0.61	11.75	
Library services quality			
Availability of textbooks and journals.	0.88	19.57	
Availability of e-library and online journal membership**.**	0.88	19.63	
Easy borrowing process.	0.76	18.69	.91/.65/.90
Appropriate Working hours. (Long working hours).	0.78	16.17	
Friendliness.	0.72	14.49	
Supportive services quality			
Size of the classrooms.	0.81	15.49	
Necessary equipment in the classrooms (computer, digital projector etc)	0.83	15.79	.75/.55/.78
Catering services and cafes**.**	0.54	9.55	
Quality of providing career opportunities			
Providing knowledge which contributes to finding a job	0.70	13.96	.90/.65/.90
Effective career center.	0.75	15.19	
Good career after graduation.	0.90	20.31	
Find a job easily and quickly	0.89	19.81	
Provide better career opportunities compared with other universities.	0.77	15.76	

X^2/d.f. (714.45/289)=2.47; RMSEA= 0.068; NFI= 0.96; NNFI= 0.97; CFI= 0.98; IFI= 0.98

Notes: α = internal reliability (Cronbach 1951), ρvc(n) = variance extracted (Fornell and Larcker 1981), and ρ = composite reliability (Bagozzi 1980).

The validity of the measures was examined through a confirmatory factor analysis (CFA) with LISREL 8 (Jöreskog & Sörbom, 1996). PRELIS was used to compute the covariance matrix used by LISREL. Results (in Table 4), as interpreted by the goodness-of-fit measures, showed that the model fits the data well, confirming the convergent validity characteristic of the measures (X^2/d.f. (714.45/289) =2.47; RMSEA= 0.068; NFI= 0.96; NNFI= 0.97; CFI= 0.98; IFI= 0.98).

To verify the reliability for each dimension, Cronbach's alpha was assessed and the composite reliability (ρ) was calculated. A complementary measure is the average variance extracted, which directly shows the amount of variance that is captured by the construct in relation to the amount of variance due to measurement error.

The reliability statistics for the capability dimension were shown in Table 4. All the items were significantly related to their specified constructs, verifying the posited relationships among the indicators and constructs. The Cronbach's alphas vary from 0.75 to 0.93 and the construct reliabilities range from 0.78 to 0.93, both exceeding the minimum recommended level of 0.60. The average variance-extracted meets the recommended 50 percent (Diamantopoulos & Siguaw (2000) cited from Vanhala *et al*. 2011) in all components.

Validity assessment

Validity is the extent to which a measure or set of measures correctly represents the concept of study. For the purpose of validating the five service quality constructs, the following validity tests, namely, face validity, content validity, and construct validity (convergent and discriminant validity) were conducted. As was noted in section 2.2, the authors have already assessed the face and content validity.

Construct validity

Bagozzi, Yi, and Phillips (1991: 422) note that "Without assessing construct validity one cannot estimate and correct for the confounding influences of random error and method variance, and the results of theory testing may be ambiguous. According to Hair, Black, Babin, Anderson, and Tatham (2006, p. 776), "construct validity is the extent to

which a set of measured items actually reflects the theoretical latent construct those items are designed to measure." Churchill (1979) suggests that convergent and discriminant validity should be assessed in investigating construct validity. Therefore, as part of the construct validity check, analyses of convergent and discriminant validity were performed.

Convergent validity is analyzed to determine whether the "indicators of a specific construct should converge or share a high proportion of variance in common" (Hair *et al*., 2006, p. 776). In other words, convergent validity refers to the extent of correlation between the intended measure and other measures used to measure the same construct (Hung & Petrick, 2010). To establish convergent validity, the magnitude of factor loadings should be greater than .6 (Bagozzi & Yi, 1988).

Discriminant validity refers to the extent of dissimilarity between the intended measure and the measures used to indicate different constructs. It can be examined by monitoring the inter-correlations among variables (Hung & Petrick, 2010). According to Diamantopoulos (2005: 6) "Establishing discriminant validity simply means that one can empirically differentiate the construct from other constructs that may be similar and that one can point out what is unrelated to the construct". Farrell (2010) defines discriminant validity as a latent variable able to account for more variance in the observed variables associated with it than a) measurement error or similar external, unmeasured influences; or b) other constructs within the conceptual framework. He also stresses that researchers can not be certain whether results confirming hypothesized structural paths are real or whether they are a result of statistical discrepancies unless they assess discriminant validity. Several methods are suggested by the literature to assess discriminant validity such as paired constructs test, average variance extracted versus squared correlation test, and Multitrait-multimethod matrix (MTMM). For paired construct test, Anderson and Gerbing (1988) recommend that the parameter estimate for two factors be constrained to 1.0 (constrained model) and compared to a model where this parameter is freely estimated (unconstrained model). For the second method, a researcher compares the AVE of each construct with the shared variance between constructs. If the AVE for each construct is greater than its squared correlation with any other construct, discriminant validity is supported (Fornell & Larcker, 1981). The last method, MTMM method, uses more than one measure of constructs and more than one method to measure them to assess discriminant validity (Farrell, 2010).

In this study, the authors use, average variance extracted (ρvc(n)), composite reliability (ρ), and the item factor loadings to assess convergent validity, according to the following criteria: ρvc(n) >0.5, factor loadings>0.6, and ρ >0.6. As shown in Table 4, the item factor loadings are consistently above 0.6 (only two items had less than 0.6: Curriculum is flexible: 0.50 and Catering services and cafes**:** 0.54) and significant ($p<0.01$), therefore suggesting convergent validity. Correlations <0.90 indicate distinct constructs and low correlations indicate discriminant validity (Ruvio, Shoham, & Brencic, 2008). As a test of discriminant validity, the correlations among the latent constructs were checked (in Table 5): they provided evidence of discriminant validity.

Table 5: Scale means, standard deviations, and correlations

Scale	**Mean (s. d.)**	Academic quality	Administrative services quality	Library services quality	Supportive services quality	Quality of providing career opportunities
Academic quality	3.70 (.79)	1.00				
Administrative services quality	3.31 (.95)	0.57	1.00			
Library services quality	3.65 (.95)	0.49	0.46	1.00		
Supportive services quality	3.78 (.92)	0.44	0.39	0.51	1.00	
Quality of providing career opportunities	3.44 (.90)	0.65	0.53	0.61	0.59	1.00

More rigorous evidence requires that the individual ρvc(n) of each construct must be higher than the squared correlation between the two constructs (Fornell & Larcker, 1981). As shown in Table 4, Table 5, and Table 6 this condition is met. Therefore, the CFA model demonstrates discriminant validity.

Table 6: Squared correlations

Scale	Academic quality	Administrative services quality	Library services quality	Supportive services quality	Quality of providing career opportunities
Academic quality	1.00				
Administrative services quality	0.32	1.00			
Library services quality	0.24	0.21	1.00		
Supportive services quality	0.19	0.15	0.26	1.00	
Quality of providing career opportunities	0.42	0.28	0.37	0.35	1.00

Higher order factor

According to Noar (2003) a hierarchical model tests the idea that a second-order factor can account for relations between the five HEDQUAL factors. Therefore, this model recognizes that the five constructs are related. However, it goes further suggesting that all factors are related to a higher order factor. Retention of such a model suggests that summing the total of the entire scale is appropriate and represents a meaningful and interpretable score. The advantage of a second-order CFA is that it is a more restrictive theoretical model. It provides us with more information as to the relationship between the higher order HEDQUAL construct and the lower-order factors in the form of path coefficients rather than in the form of correlations as in the measurement model (Matsuno, Mentzer & Rentz, 2000).

Therefore, a higher-order factor model of HEDQUAL was also estimated. (see Figure 2)

Concluding remarks

Examination of service quality levels can help us to understand consumer behavior satisfaction levels with services offerings better. The aim of this study is to reveal students' expectations from MBA education today in detail using the HEDQUAL scale rather than the previous HEdPERF scale, under the following dimensions: "Academic quality", "Administrative services quality", "Library services quality", "Supportive services quality", and "Quality of providing career opportunities". We believe that such an approach would guide the institutions a lot better.

Several tests such as normality, unidimensionality, reliability and validity tests were conducted to examine the appropriateness of HEDQUAL for MBA programs. HEDQUAL contains 26 items and five factor structures (administrative services quality, library services quality, quality of providing career opportunities, academic quality, and supportive services quality). All the tests appear to indicate that it is an appropriate instrument that can be used to measure the service quality for MBA programs.

The availability of a services quality measurement instrument, such as HEDQUAL**,** which is specifically designed for the MBA programs, contributes significantly to the literature and practitioners.

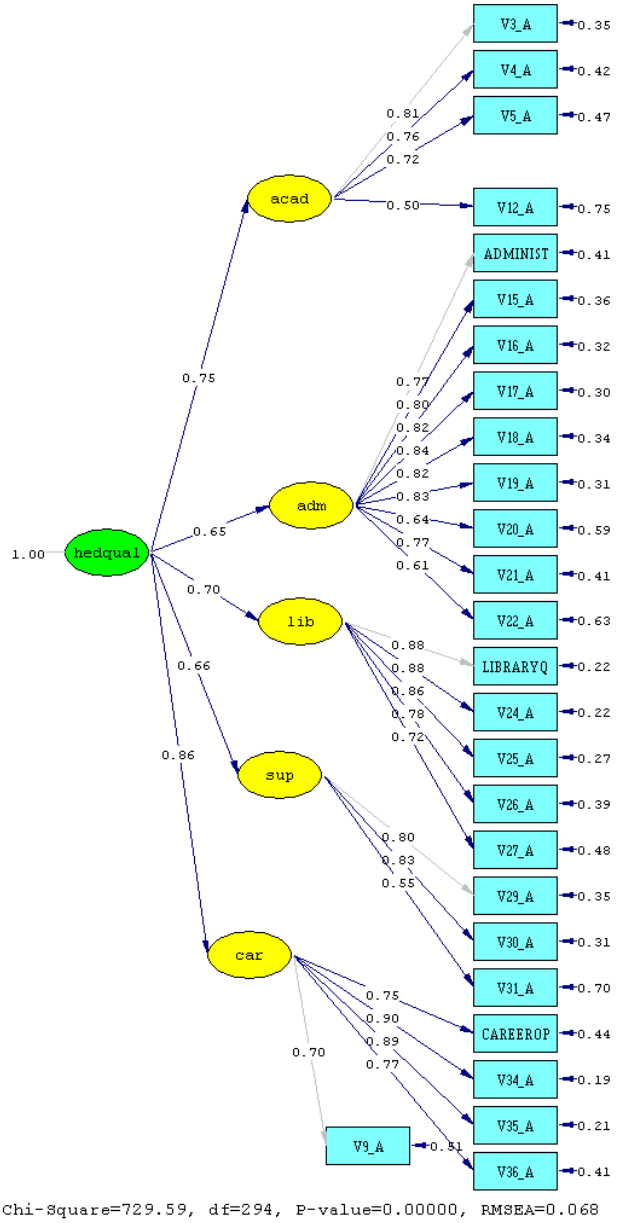

Figure 2: Higher order factor

References

Abdullah, F. 2006a. 'The development of HEdPERF: A new measuring instrument of service quality for the higher education sector', *International Journal of Consumer Studies*, **30**(6):569-81.

Abdullah, F. 2006b. 'Measuring services quality in higher education: HEdPERF versus SERVPERF', *Marketing Intelligence&Planning*, **24**(1):31-47

Al-Alak, B.A.M. 2006. 'The impact of marketing actions on relationship quality in the higher education sector in Jordan', *Journal of Marketing for Higher Education*, **16**(2):1-23.

Anderson, J.C. & Gerbing, D.W. 1988. 'Structural equation modeling in practice: A review and recommended two-step approach', *Psychological Bulletin*, **103**(3): 411-423.

Arambewela, R., Hall, J. & Zuhair, S. 2005. 'Postgraduate international students from Asia: Factors influencing satisfaction', *Journal of Marketing for Higher Education*, **15**(2):105-127.

Armstrong, J. & Overton, T. 1977. 'Estimating nonresponse bias in mail surveys', *Journal of Marketing Research*, **14**(3): 396– 402.

Arena, M., Arnaboldi, M. & Azzone, G. 2013. 'Students perceptions and central administrative services: The case of higher education in Italy', *Studies in Higher Education*, **35**(8):941-959.

Awan, H.M. 2010. 'Be_Squal: A multiple-item scale for evaluating services quality of business education in Pakistan'. Paper read at the International Conference on Assesing Quality in Higher Education, Lahore-Pakistan, December 6-8.

Bagozzi, R.P. 1980. *Causal models in marketing*. New York: John Wiley & Sons.

Bagozzi, R.P. & Yi, Y. 1988. 'On the evaluation of structural equation models', *Journal of the Academy of Marketing Science*, **16**(1): 74–94.

Bagozzi, R.P., Yi, Y. & Phillips, L.W. 1991. 'Assessing construct validity in organizational research', *Administrative Science Quarterly*, **36**(3): 421-458.

Barnes, B.R. 2007. 'Analysing service quality: The case of post-graduate Chinese students', *Total Quality Management*, **18**(3): 313-331

Becket, N. & Brookes, M. 2006. 'Evaluating quality management in university departments', *Quality Assurance in Education*, **14**(2): 123-42.

Brochado, A. 2009. 'Comparing alternative instruments to measure services quality in higher education', *Quality Assurance in Education*, **17**(2):174-90.

Butt, B.Z. & Rehman, K.U. 2010. 'A study examining the students satisfaction in higher education', *Procedia Social and Behavioral Sciences*, **2**: 5446-5450.

Cheng, Y.C. & Tam, M. M. 1997. 'Multi-models of quality in education', *Quality Assurance in Education*, **5**(1): 22-31.

Churchill, G.A. Jr 1979. 'A paradigm for developing better measures of marketing constructs', *Journal of Marketing Research*, **16**: 64–73.

Cronbach, L.J. 1951. 'Coefficient alpha and the internal structure of tests', *Psychometrika*, **22**(3): 297-334.

Cronin, J.J. & Taylor, S.A. 1992. 'Measuring service quality: Re-examination and extension', *Journal of Marketing*, **56**(3): 56-68.

DeVellis, R.F. 2003. *Scale development: Theory and applications* (2nd Edition.). Thousand Oaks, CA: Sage.

Diamantopoulos, A. 2005. 'The C-OAR-SE procedure for scale development in marketing: A comment', *International Journal of Research in Marketing*, 22: 1-9.

Drolet, A.L. & Morrison, D.G. 2001. 'Do we really need multiple-item measures in service research?' *Journal of Service Research*, **3**(3): 196-205.

Elliott, K.M. & Healy, M.A. 2001. 'Key factors influencing student satisfaction related to recruitment and retention', *Journal of Marketing for Higher Education*, **10**(4): 1-11.

Farrell, A.M. 2010. 'Insufficient discriminant validity: A comment on Bove, Pervan, Beatty, and Shiu (2009)', *Journal of Business Research*, **63**:324–327.

Fornell, C. & Larcker, D. 1981. 'Evaluating structural equation models with unobservable variables and measurement error', *Journal of Marketing Research*, **28**:39–50.

Hair, J. F., Black, W. C., Babin, B. J., Anderson, R. E. & Tatham, R. L. 2006. *Multivariate data analysis* (6th Edition). New Jersey: Prentice Hall International.

Heslop, L. A. & Nadeau, J. 2010. 'Branding MBA programs: The use of target market desired outcomes for effective brand positioning', *Journal of Marketing for Higher Education*, **20**:85-117.

Hinkin, T. R. 1995. 'A review of scale development practices in the study of organizations', *Journal of Management*, **21**:967–988.

Hinkin, T.R. 1998. 'A brief tutorial on the development of measures for use in survey questionnaires', O*rganizational Research Methods,* **1**:104-121.

Hung, K. & Petrick, J.F. 2010. 'Developing a measurement scale for constraints to cruising, *Annals of Tourism Research*, **37**(1): 206–228

Jöreskog , K.G. & Sörbom, D. 1996. *LISREL 8 User's reference guide.* Chicago, USA: Scientific Software International.

Khodayari, F. & Khodayari, B. 2011. 'Services quality in higher education', *Interdisciplinary Journal of Research in Business*, **1**:9.

Kiran, K. & Diljit, S. 2012. 'Modeling web based library service quality', *Libray & Information Science Research*, **34**(3):148-196.

Kitchroen, K. 2004. Literature review: Service quality in educational institutions', *ABAC Journal*, **24**: 14 – 25.

Kuo, Y. & Ye, K. 2009. 'The causal relationship between service quality, corporate image and adults' learning satisfaction and loyalty: A study of professional training programmes in a Taiwanese vocational institute', *Total Quality Management & Business Excellence*, **20**:749-762.

Lane, F.C., Anderson, B, Ponce, H. & Natesan, P. 2012. 'Factorial invariance of Libqual as a measure of library services quality over time', Library & Information Science Research, **34**(1):22-30.

Lages, C., Lages, C.R. & Lages, L. F. 2005. 'The RELQUAL scale: A measure of relationship quality in export market ventures', *Journal of Business Research*, **58**(8): 1040–1048.

Lau, L.K. 2003. 'Institutional factors affecting student retention', *Education*, **124**:126-136.

Lewis, R.C. & Booms, B.H. 1983. 'The marketing aspects of service quality'. **In** Berry,L., Shostack, G. & Upah, G. (eds.). *Emerging perspectives on services marketing.* Chicago, IL: American Marketing Association, pp. 99-107.

Matsuno, K., Mentzer, J.T. & Rentz, J.O. 2000. 'A refinement and validation of the MARKOR scale', *Journal of the Academy of Marketing Science*, **28**(4*):* 527-539

Mitrega, M., Forkmann, S., Ramos, C. & Henneberg, S.C. 2012. 'Networking capability in business relationships - Concept and scale development', *Industrial Marketing Management*, **41**: 739–751.

Nadiri, H. & Mayboudi, S.M.A. 2010. 'Diagnosing university students' zone of tolerance from university library services', *Malaysian Journal of Library& Information Science*, **15**(1): 1-21

Negra, A. & Mzoughi, N. 2012. 'How wise are online procrastinators? A scale development', *Internet Research*, **22**(4): 426 – 442.

Nesset, E. & Helgesen, O. 2009. 'Modelling and managing student loyalty: A study of a Norwegian University Collage', *Scandinavian Journal of Educational Research*, **53**(4):327-345.

Noar, S.M. 2003. 'The role of structural equation modeling in scale development, structural equation modeling', *A Multidisciplinary Journal*, **10**(4): 622-647.

Parasuraman, A., Zeithaml, V.A. & Berry, L.L. 1988. 'SERVQUAL: A multiple-item scale for measuring consumer perceptions of services quality', *Journal of Retailing*, **64**(1): 12-40.

Rojas-Méndez, J.I., Vasquez-Parraga, A.Z., Kara, A. & Cerda-Urrutia, A. 2009. 'A Determinants of student loyalty in higher education: A tested relationship approach in Latin America', *Latin American Business Review*, **10**: 21-39.

Rossiter, J.R. 2002. 'The C-OAR-SE procedure for scale development in marketing', *International Journal of Research in Marketing* **19**(4): 305–335.

Ruvio, A., Shoham, A., Brencic, M.M. 2008. 'Consumers' need for uniqueness: short-form scale development and cross-cultural validation', *International Marketing Review*, **25**: 33 – 53.

Sampaio, C.H., Perin, M.G., Simoes, C. & Kleinowski, H. 2012. 'Students' trust, value and loyalty: Evidence from higher education in Brazil', *Journal of Marketing For Higher Education*, **22**: 83–100.

Shanahan, P. & Gerber, R. 2004. 'Quality in university student administration: stakeholder concepts', *Quality Assurance in Education*, **12**(4):166.

Shank, M.D., Walker, M. & Hayes, T. 1995. 'Understanding professional service expectations: Do you know what our students expect in a quality education?' *Journal of Professional Service Marketing*, **13**(1): 71-89.

Sohail, M.S. & Shaikh, N.M. 2004. 'Quest for excellence in business education: A study of student impressions of service quality', *The International Journal of Educational Management*, **18**:58-65.

Steenkamp, JE. & Van Trijp, HC. 1991. 'The use of LISREL in validating marketing construct', *International Journal of Research Marketing*, **8**(4): 283 –99.

Styles, C. 1998. 'Export performance measures in Australia and the United Kingdom', *Journal of International Marketing*, **6**(3):12– 36.

Tang, S.F. 2012. 'Academic quality characteristics and satisfaction: An empirical survey among the students of two Malaysian private universities', **2**(1): 213-228.

Thomas, S. 2011. 'Linking satisfaction to loyalty: A structural model for business schools'. Paper read at Eighth AIMS International Conference on Management, January 1-4. Ahmedabad-India.

Tsinidou, M., Gerogiannis, V. & Fitsilis, P. 2010. 'Evaluation of the factors that determine quality in higher education: An emprical study', *Quality Assurance in Education*, **18:** 227-244.

Tuzun, I.K. & Devrani, T.K. 2008. 'Müşteri memnuniyeti ve müşteri-çalışan etkileşimi üzerine bir araştırma' *Eskisehir Osmangazi Universitesi IIBF Dergisi*, **3**:13-24.

Ugah, D.A. & Chilaka, G. 2011. 'Size and quality of information sources and the use of library services in the libraries in the universities in the southeast of Nigeria', *Library Philosophy and Practise*, 2011. [online]URL:http://unllib.unl.edu/LPP/ Accessed on 14-02-2013.

Vanhala, M., Puumalainen, K .& Blomqvist, K. 2011. 'Impersonal trust: The development of the construct and the scale', *Personnel Review*, **40**: 485 – 513.

Venkatraman, S. 2007. 'A framework for implementing TQM in higher education programs', *Quality Assurance in Education*, **15**(1): 92-112.

Wiers-Jenssen, J., Stensaker, B. & Grogaard, J.B. 2002. 'Student satisfaction: Towards an empirical deconstruction of the concept', *Quality in Higher Education*, **8**: 183-195.

Worthington, R.L. & Whittaker,T.A. 2006. 'Scale development research. A content analysis and recommendations for best practices', *Counseling Psychology*, **34**:806–838.

Wright, C. & O'Neill, M. 2002. 'Services quality evaluation in the higher education sector: An empirical investigation of students' perceptions', *Higher Education Research&Development*, **21**(1): 23-39

Zeithaml, V.A. 1988. 'Consumer perceptions of price, quality and value: a means-end model and synthesis of evidence', *Journal of Marketing*, **52**(3): 2-22.

Appendix

HEDQUAL SCALE

Academic Quality **Scale:** 1=Strongly Disagree 5=Strongly Agree					
1-Opportunity of having a good communication with academicians.	1	2	3	4	5
2- Positive attitudes/behaviors towards all students.	1	2	3	4	5
3- High academic support towards students from academicians.	1	2	3	4	5
4- Flexible curriculum.	1	2	3	4	5
Administrative Services Quality					
5- Having enough knowledge about systems and procedures.	1	2	3	4	5
6- Rapid service.	1	2	3	4	5
7- Timely notification to students regarding schedule changes and/or cancellations new decisions, activities etc.	1	2	3	4	5
8- Clear guidelines.	1	2	3	4	5
9- Promise keeping.	1	2	3	4	5
10- Availability of information material.	1	2	3	4	5
11- Sufficient working hours.	1	2	3	4	5
12- Friendliness.	1	2	3	4	5
13- Easily accessible administrative personnel. (phone, email).	1	2	3	4	5
Library Services Quality					
14- Availability of textbooks and journals.	1	2	3	4	5
15- Availability of e-library and online journal membership**.**	1	2	3	4	5
16- Easy borrowing process.	1	2	3	4	5
17- Appropriate working hours. (Long working hours).	1	2	3	4	5
18- Friendliness.	1	2	3	4	5
Supportive Services Quality					
19- Size of the classrooms.	1	2	3	4	5
20- Necessary equipment in the classrooms (computer, digital projector etc).	1	2	3	4	5
21- Catering services and cafes**.**	1	2	3	4	5
Quality of Providing Career Opportunities					
22- Providing knowledge which contributes finding a job.	1	2	3	4	5
23- Effective career center.	1	2	3	4	5
24- Good career after graduation.	1	2	3	4	5
25- Find a job easily and quickly	1	2	3	4	5
26- Providing better career opportunities compared with other universities.	1	2	3	4	5