Measuring and Evaluating Graduate Students Perceptions at Higher Education Institutions in Ludhiana, Punjab

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ABSTRACT This study assesses overall student's perceptions from the higher education intuitions in Ludhiana, Punjab and to uncover the constructs that underlie these desire expectations to reveal the underlying benefits that students look for. This paper focuses on identifying and evaluating techniques used to take on the challenges of quality improvement in higher education institutions. A questionnaire consisting of 32 items was developed to measure the construct and its dimensions. The purpose of this work is to examine the performance of six alternative measures of service quality in the higher education system in Punjab. The dimensions are as follows: Physical aspects (5 items), Reliability (5 items), Competence (4 items), Personal interaction (7 items), Course structure (5 items) and Policy (6 items). The first draft of the questionnaire was subject to a pilot testing through a focus group and an expert evaluation. Data were gathered from a 400 students' sample of in Ludhiana, Punjab. Structural equation modeling using AMOS 16 was used to test the higher education service quality. Confirmatory factor analysis results provide strong support for the four dimensional structure of service quality in higher education institutions.

Introduction:

Higher education institutions are playing an increasingly important role in the economy of many nations. Stern and Tseng (1993) reported that few higher institutions have adopted a service quality philosophy. Earlier research has demonstrated that students are reluctant to complain about poor service (Gronhaug and Arndt, 1980) but these students are becoming increasingly more value conscious. The educational institutions in India, today's world, increasingly find themselves in an environment that is focused on understanding the role and importance of service quality. Relentless global, social, cultural and economic change is being translated by educational institutions into a continuous stream of complex reforms based on quality. Not oblivious to the need for adaptation to serve the interests of its stakeholders in terms of greater responsiveness, responsibility, accountability and increased expectations, the educational systems are being pressurized to shift their focus from quantitative expansion, to an emphasis on quality. The quality of service experience becomes an important factor in buying decision (Baston, 1995). Higher education quality assurance systems place emphasis on the student experience as one of the most important assessment criteria (Allen and Davis, 1991; Ramsden, 1991). In response to growing concerns from stakeholders about poor or inconsistent quality, institutions of higher education are increasingly realizing the significance of students centered philosophies and thereby, seeking ways to improve and provide better students' service. Students' service could be viewed as a philosophy of management permeating throughout the institutions with the aim of satisfying the students through the quality of services. Educational institutions have begun to realize the importance of this philosophy, which is shown by an increasing concern among academics about the dissatisfaction of students regarding the quality of education and overall management of educational institutions. The educational literature suggests that there is mounting pressure from the students, parents, employers and even legislators, to close the widening gap between their expectations of institutional performance and the actual performance (Brigham, 1994). Quality in higher education exhibits all the classical features of services: it is intangible and heterogeneous, meets the criterion of inseparability by being produced and consumed at the same time, satisfies the perishability criterion and assumes the students participation in the delivery process (Cuthbert 1996a). Quality in services, with impact on students' psychology and resultant behavior, exhibited in terms of a positive attitude towards higher education services, has led to the conclusion that the quality is the single most important factor for long–term success and survival. Nowadays, educational institutes have begun to realize the significance of a qualitative orientation and commensurate to this, there have been attempts at providing better services to the students.

The objective of this research paper is to analyze service quality among a sample of Indian graduate students. Starting with the theoretical background, the paper outlines the results of a study conducted on the students as primary customers to obtain a perspective on service quality of select educational institutions. Based on the literature review, followed by a pilot study, the various students' requirements were identified. The modified SERVQUAL model was applied to identify the gap and determine the level of service quality in higher education institutes. Following this, use of structural equation modeling, confirmative factor analysis was set of minimum quality components that meet the requirements of the students as important customers Therefore, it is imperative that educations institutes actively monitor the quality of their services and commit to continuous improvements in an effort to respond to the needs of the institutional constituencies.

Service quality: The service quality has aroused considerable interest and debate in the research literature because of the difficulties in both defining it and measuring, it with no consensus emerging on either (Parasuraman *et al.,* 1985; Dotchin & Oakland, 1994; Gaster, 1995; Asubonteng *al.,* 1996). A definition of 'service quality' is person dependent and has different meaning for different people. Most definitions of service quality are customer- centered (Galloway & Wearn, 1998), with customer satisfaction being seen as functions of perceived quality (Anderson & Sullivan, 1993), or perceived quality being a function of customer satisfaction (Parasuraman et *al.,* 1988). Thus, the commonly accepted orientation defines service quality as the extent to which a service meets customers' needs or expectations (Lewis & Mitchell, 1990; Dotchin & Oakland, 1994; Asubonteng *et al.,* 1996). Service quality, as perceived by customers, involves a comparison of what they feel the service should be (expectation, E) with their judgment of the services they received (perception, P) (Sasser & Arbeit, 1978; Gronroos, 1984; Parasuraman et *al.,* 1985; Zeathaml et *al.,* 1985). It is defined as the difference between customer expectations of service and perceived service. If expectations are greater than performance, then perceived quality is less than satisfactory and hence customer dissatisfied occurs (Parasuraman et *al.,* 1985; Lewis & Mitchell, 1990)

Measuring service quality: To achieve quality as perceived by the customer, proactive organizational commitment is required. Berry (1995) suggests that service plays an important role in enhancing value, and can positively influence a firm's success. From a customer perspective, a provider's service can help to offset potential burdens, like having to play a high price, or

make a purchase from retail establishment situated in an inconvenient location. As a result, understanding and measuring customer expectations and performance are therefore an essential component that can be used to enhance a company's service provision. In analyzing service from the customer's perspective, research by Parasuraman *et.al* (1988) yielded a useful concept of ten potentially overlapping dimensions. When developing their framework further, extensive statistical analysis revealed significant correlations between certain dimensions depicted in the original concept, and this led to the regrouping of the original ten items into five subsequent dimensions(tangibles, reliability' responsiveness, assurance and empathy) and was labeled as the SERVQUAL scale (Parasuraman *et.al* 1988). The instrument represents a multi-item scale that since its development has been widely used for measuring consumer expectations and perceptions of service quality. It consists of 22 parallel expectation (E) and perception (P) statements the five service quality dimensions. In order to obtain view for the statement, consumers are required to select a response on Likert scales that range from strongly disagree to strongly agree. This then allows for the difference scores for each dimension to be calculated. The difference (P-E = Q) represents the measure of service quality (Q). Where Q is negative a service gap exists. However, Q is positive, customer expectations are being exceeded.

A further section of the instrument provides for the measurement of the relative importance associated with each dimension. After the mean for each dimension has been calculated, the relative importance score can then be used to calculate a weighted average score for each dimension. The instrument was developed with the intention that it could be applied in a variety of service setting and, as a result, many researchers including Babukus & Mangoled (1992) have taken the broad framework and added or deleted items based on the context of their own research investigations.

Service quality in higher education: Service quality in higher education is relative concept, with respect to the stakeholders in higher education and circumstances in which it is involved. In other words, quality means different things to different people as well as person may adopt different conceptualizations at different moments (Zafiropoulos et al.2005). However, (Sahney et al. 2004) highlighted that definitions of quality in education follow the general definitions of quality. The applicability of service quality in the educational sector attracted the interest of many theorists and researcher (Edwell, 1993; Sherr & Lozier, 1991; Tribus, 1994; Brigham, 1993). Educational institutions are perceived as organizations designed to transform teaching, curriculum, organizational and management processes in a way which serves students interests. Substantial interest in service quality in management has begun to emerge (Sallis, 1993), and this interest has been focused primarily on higher education institutes(Coate, 19900; Cope & Sherr, 1991; Masters & Leiker, 1992; Saunders & Walker, 1991; Sutcliffe & Polock, 1992; Van Vught & Westerheijden, 1992; Winter,1991). As with services, the concept of quality when applied to higher education has been inclusive (Williams, 1990; Staropli, 1992; Liaison committee of records' conferences, 1993; Cheng & Tam, 1997) service quality in higher education has been defined variedly as, excellence in education (Peters & Waterman, 1982), value in addition(Feigenbaum,1951), fitness for purpose (Reynolds,1986; Brennan et al. ,1992;Tang &Zairi,1998), fitness of educational outcome and experience for use (Juran & Gryna,1998), conformance of education output to planned goals, specifications and requirements (Gilmore, 1974; Crosby, 1979), defect avoidance in education process (Crosby, 1979), and meeting or exceeding customer's expectations of education (Parasuraman et al. 1985). Quality initiatives have been the subject of enormous amount of practitioner and academic discourse, and various levels have found a gateway into higher education (Avdjieva & Wilson, 2002).Many academic institu-

tions have implemented such policies in response to a reduction in student funding, complaints by employers and parents, as well as the pioneering success of such drivers in many corporate business (Kanji and Tambi, 199). However, since the early to mid 1990s a stream of work has explored aspects of service quality relating to the teaching and learning factors, and the environmental attributes influencing higher education (Harrop & Douglas, 1996; Narasimhan, 1997; and Shank et al. 1995), with the majority of such investigations using students' evaluations to assess quality (Rowley, 1997; Aldridge & Rowley, 1998). It may be concluded that service quality in higher education is a multiple concept with varying conceptualizations and this poses problems in formulating a single, comprehensive definition. It concludes within its ambit the quality of inputs in the form of students, faculty, support staff and infrastructure; the quality of processes in the form of learning and teaching activity; and the quality of outputs in the form of the enlightened students that move out of the system. In fact, it is all permeating covering the different aspects of academic life.

Gap analysis in higher education: Gap analysis is not new in higher educational context, and a number of studies have been influenced by the work of (Parasuraman *et al.,* 1985). For example, (Long *et al.,*1999) 'gap analysis' to develop a number of questions in order to compare what students 'look for'(expect) and what they 'experience' on a course. (Sander *al.,* 2000) meanwhile examined undergraduates' expectations and preferences in teaching, learning and assessment. (LaBay & Comm 2003) also developed a number of measures to evaluate student expectations and perceptions, concerning their tutor, on a sample of undergraduate and distance learning student. Using a wide range of scale, (Lampley 2001) formed a number of question statements relating to responsiveness/caring, records/paperwork, university services, accessibility/safety, knowledge/scheduling, facilities/equipment, and public relations to measure expectations and perceptions among doctoral students in six universities. Customers judge actually quality according to their expectations (Ghobadian *et al.,* 1994; Dotchin &Oakland, 1994: Kandampully, 1997; Fergueson *et al.,* 1999; Lee *et al.,* 2000; Walter & Germunden, 2000). The ultimate measure of quality is whether or not the product or service lives up to expectations of the customers. The most widely used and tested service quality instrument has SERVQUAL, based on the service quality 'gap model' (Parasuraman *et al.,*1988,1991,1993,1994), which defines service quality as a function of gap between customers' expectations of a service and their perceptions of the actual service delivery by organization. In brief, SERVQUAL is recognized as a tried and tested instrument that has been successfully applied in various different contexts (Buttle, 1996). Its strengths more than outweigh any deficiencies, and the results can be presented in a format useful for targeting specific service improvements (O'Neill & Palmer, 2001). Over recent years the higher education sector has become more quality conscious, which has been fuelled by increasing competition, a reduction in state funding, and greater consumer demands (Ford *et al.,* 1999; Kanji & Tambi, 1999). In response, a growing number of institutions and academics have grappled with such quality issues and have undertaken research with the aim of addressing some of the key concerns (Lau, 2003; Oldfield & Baron, 2000).

This research therefore aims to bridge this gap, by using a modified SERVQUAL instrument to investigate service quality among graduate Indian students. However, for this study the terminology has been borrowed, the items that these dimensions contain have changed to adapt to the needs of an educational service. Other dimensions have also been added.

The conceptual model: As to higher education in India, six dimensions which composed distinct components of perceived service quality considered.

Figure-1: Perceived service quality model
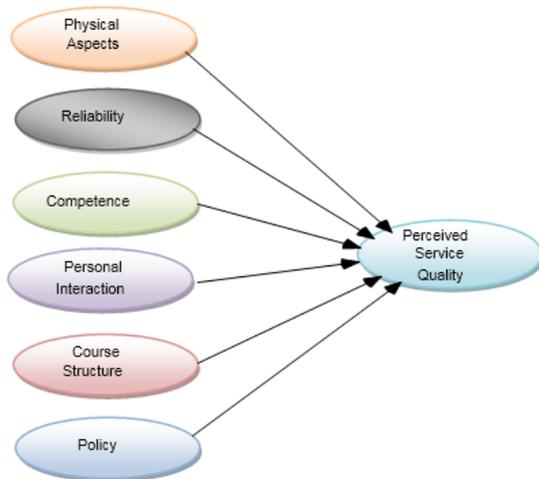
Research Methodology:

Sampling and Data collection: We solicited anonymous response to questionnaire given to graduate students in Ludhiana. Questionnaires were administered during the first three weeks of July 2015 data were gathered from students of graduate programs. Surveys were hand delivered to all students participating in the course. Four hundred students participating in several course of the degree programs accepted to participate in this study. Students were given verbal instructions, and completed the questionnaire during the last twenty minutes of class, resulting in a

100 percent response rate. Convenience sample was deemed appropriate because the purpose of the study was not to provide point and interval estimates of the variables, but to explore the relationships among them, and thus is adequate for this purpose (Cader *et al.,* 1981) response were gathered on the perceived service quality of the graduate students in university.

Measure Instrument: The literature review along with interaction held with faculty members provided the basis for constructing our conceptual model and for developing the questionnaire used in this study. The survey instrument contained 32 variables related to different dimensions of the higher education institutions offering, 3 variables measuring behavioral intentions and one measure of overall service quality. Items pertaining to service quality assessment were measured on a 5 point Likert scale (1 = Strongly disagree to 5 = Strongly agree). According to recommendations made by Carman (1990) and Cronin and Taylor (1992), service quality was measured using performance only items. The information gathered was analyzed using the factorial analysis and multiple regression techniques. The factorial analysis allowed us to identify the dimensional structure of perceived service quality. Then, the regression analysis allowed us to identify the more important dimensions. Confirmatory factor analysis was also used to validate the factorial structure founded with exploratory factor analysis and to asses convergent and discriminant validity of the instrument.

Data Analysis and interpretation: The next step of education service evaluation is to collect the results of the modified SERVQUAL questionnaire, and adopt various statistical methods to analyze the data. This study will adopt a special measurement to analyze the data in the following aspects.

Table-1: Mean score (Standard deviation) for modified SERVQUAL dimensions

S.No.	Items	P (Std. D)	E (Std. D)	P-E
Physical Aspects				
1	Modern-looking equipment	1.932(1.343)	3.783(1.142)	-1.85
2	Visually appealing	2.454(1.212)	3.827(1.124)	-1.37
3	Support services like Library, Computer lab etc.	2.512(1.532)	4.113(1.167)	-1.60
4	Neat cleaned, attractive and convenient	2.356(1.121)	4.235(1.356)	-1.88
5	Sufficient physical equipment	2.433 (1.124)	3.827(1.113)	-1.39
Reliability				
6	Deliver service on time	2.932(1.152)	3.717(1.765)	-.79
7	Ability to solve complains	3.212(1.222)	4.166(1.112)	-.95
8	Perform right the first time	2.245(1.165)	3.898(1.141)	-1.65
9	Promises to do something by a certain time	2.456(1.103)	3.764(1.109)	-1.31
10	Solving the problems of students	3.876(1.213)	3.873(1.214)	.00
Competence				
11	Sufficient faculty/support staff	3.555(1.235)	4.205(0.952)	-.65
12	Experienced faculty	3.598(1.151)	4.328(0.845)	-.73
13	Theoretical knowledge and adequate qualification	3.823(1.167)	4.436(0.933)	-.61
14	Mastery of academic knowledge	3.175(1.156)	4.232(0.852)	-1.06
Personal interaction				
15	Individual attention to students	3.784(1.267)	4.197(1.004)	-.41
16	Prompt service for students	3.656(1.253)	4.134(0.856)	-.48
17	Instills confidence in students	3.344(1.232)	4.209(0.924)	-.86
18	Willing to help students	3.132(1.212)	4.385(0.710)	-1.25
19	Never busy for students	3.124(1.253)	3.907(1.124)	-.78
20	Provide sufficient time to students	3.386(1.213)	4.324(0.745)	-.94
21	To be courteous	3.245(1.146)	4.265(0.828)	-1.02
Course structure				
22	Update syllabus time to time	3.438(1.133)	4.308(1.031)	-.87
23	Designs relevant course curriculum	3.879(1.393)	4.183(0.920)	-.30
24	Encourages teamwork and communication skill	3.432(1.322)	4.103(0.914)	-.67
25	Computer is integral part of the syllabus	2.776(1.455)	4.174(1.119)	-1.40
26	Course contains basic knowledge	3.433(1.265)	4.108(0.905)	-.67

Policy				
27	Appropriate procedure of knowledge delivering	3.904(1.186)	4.148(0.894)	-.24
28	Consistency of teaching activities	3.675(1.143)	4.172(0.815)	-.50
29	Record keeping on performance	3.378(1.161)	4.131(0.983)	-.75
30	Effective classroom management	2.547(1.243)	4.303(1.074)	-1.76
31	Reward structure for work done	3.308(1.337)	4.424(0.768)	-1.12
32	Communication between students and teachers	3.212(1.404)	4.198(0.714)	-.99
SERVQUAL totals		101.212	132.077	-30.87
SERVQUAL average		3.162	4.127	-.965

The mean scores from the sample are illustrated in Tables -1. For each statement the mean Expectation (E) and Perception (P) values, along with a service quality value from the formula are presented, Q = P − E (Parasuraman et al., 1988). The three columns provide summary results for the institution, and the overall SERVQUAL results are illustrated in Table -1, above the three columns. Where the gap (P − E) is negative, this refers to perceptions of the institution falling short against initial students' expectations, and the presence of service quality gaps. The findings suggest a short fall on all the items measured. The expectation and perception items were measured using a five point Lickert scale, from 1 = strongly disagree, to 5 = strongly agree, with three serving as a mid point/neutral opinion on the scale. Mean scores greater than three identify a tendency for respondents to agree with a particular statement, whereas means of less than three indicate disagreement.

Expectations (E)
As can be seen in Tables -1, it can be concluded that expectation (E) values among the Indian graduate students per se were high (means ranging from 4.432 to 4.602). Five statements (23, 24, 25, 31 and 32) illustrate mean scores of 4.432 or greater. This suggests that Indian graduate students really have high expectations in terms of a need for staff to show a design relevant course curriculum, encourage teamwork and communication, computer is an integral part of the study, reward structure for work done and have communication between students and teachers. The students also have a desire for the experienced faculty, willing to help them, provide sufficient time and update syllabus.

Perceptions (P)
Overall nine perception items (1, 2, 3, 4, 5, 6, 8, 9, and 30) are below the mid-point 3 on the scale, suggesting there is some disagreement among students in terms of the institution modern-looking equipment, visually appealing, support services like library, computer lab etc, neat cleaned, attractive and convenient, sufficient physical equipment, deliver service on time, perform right the first time, promises to do something by a certain time and effective classroom management. Meanwhile 6 items (11, 12, 13, 14, 18 and 32) exceeded 3.5, suggesting that the sample had a tendency to agree that sufficient faculty/support staff, have experienced faculty, theoretical knowledge and adequate qualification ,teachers have mastery of academic knowledge, teachers willing to help students and communication between students and teachers. The remainder of the perception scores fell close to the mid-point, somewhere between three and four to be precise.
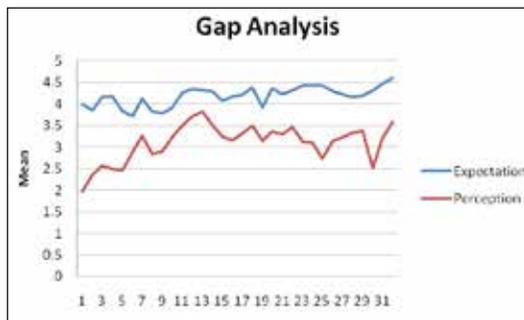

Figure-2: Gap analysis of perception and expectation

Service Quality Gaps Analysis (P-E): The service quality gaps are demonstrated in the third column of Tables -1. As each item has a negative value, students' perceptions of the service are falling short of their expectations. Paired sample t-tests were also undertaken on the perception and expectation mean items, in order to identify whether or not statistically significant service quality gaps were apparent. Findings from data presented in Table 2 demonstrate significant differences between graduate Indian students' perceptions and expectations of service on all 32 statements. Two of the paired items under the tangibles dimension – modern looking equipment and neat employees – were found to be significant at a, 0.05. It can be concluded here that there is a significant difference between the students' expectations and perceptions at the 95% confidence level. However, for all the other statements, there is a statistical significance of a 0.01, which illustrates a statistically significant gap between the students' perceptions and expectations of service at the 99% confidence level. These represent service quality gaps that the institution should take the appropriate measures on-board to bridge.

Table-2: Paired sample t-test statistics

S.No.	Items	t -test	p - value
Physical Aspects			
1	Modern-looking equipment	14.03	0.000
2	Visually appealing	13.32	0.000
3	Support services like Library, Computer lab etc.	12.13	0.000
4	Neat cleaned, attractive and convenient	15.43	0.000
5	Sufficient physical equipment	13.02	0.000
Reliability			
1	Deliver service on time	08.25	0.000
2	Ability to solve complains	09.43	0.000
3	Perform right the first time	05.06	0.000
4	Promises to do something by a certain time	07.85	0.000
5	Solving the problems of students	09.20	0.000
Competence			
1	Sufficient faculty/support staff	10.55	0.000
2	Experienced faculty	14.12	0.000
3	Theoretical knowledge and adequate qualification	17.91	0.000
4	Mastery of academic knowledge	08.35	0.000
Personal interaction			
1	Individual attention to students	13.08	0.000
2	Prompt service for students	17.02	0.000
3	Instills confidence in students	08.49	0.000
4	Willing to help students	09.63	0.000
5	Never busy for students	07.43	0.000
6	Provide sufficient time to students	12.14	0.000
7	To be courteous	17.74	0.000
Course structure			
1	Update syllabus time to time	16.12	0.000
2	Designs relevant course curriculum	12.92	0.000
3	Encourages teamwork and communication skill	14.13	0.000
4	Computer is integral part of the syllabus	13.10	0.000
5	Course contains basic knowledge	19.15	0.000
Policy			
1	Appropriate procedure of knowledge delivering	13.05	0.000
2	Consistency of teaching activities	11.37	0.000

3	Record keeping on performance	15.18	0.000
4	Effective classroom management	12.52	0.000
5	Reward structure for work done	16.64	0.000
6	Communication between students and teachers	15.89	0.000

Dimensionality: Both exploratory and confirmatory factor analysis were used to asses the dimensionality of the service quality measure. During the course of analysis, the service quality subscales were refined to produce an optimal set of items. Table-3 presents the items and the factor loadings from a principal component analysis with varimax rotation which is a tried and tested method that frequently yields a simple structure (Norman & Streiner, 1997). The factor program extracted four factors with an eigenvalue greater than 1.00 and the factors accounting for a minimum 60% of the variance.

Table-3: Factor loading matrix following varimax rotation

Statements	Dimension: 1 Competence-Personal Interaction (CPI)	Dimension: 2 Physical Aspects (PA)	Dimension: 3 Course structure (CS)	Dimension: 4 Reliability (R)	Communalities	Composite Reliability (α)
CPI-1	**0.638**				0.621	
CPI-2	**0.602**				0.632	
CPI-3	**0.727**				0.754	
CPI-4	**0.625**				0.555	
CPI-5	**0.645**				0.612	
CPI-6	**0.676**				0.678	0.943
CPI-7	**0.633**				0.632	
CPI-8	**0.740**				0.724	
CPI-9	**0.622**				0.554	
CPI-10	**0.686**				0.626	
CPI-11	**0.733**				0.755	
PA-1		**0.721**			0.712	
PA-2		**0.726**			0.754	
PA-3		**0.709**			0.732	0.827
PA-4		**0.755**			0.632	
PA-5		**0.634**			0.612	
CS-1			**0.738**		0.713	
CS-2			**0.604**		0.602	0.813
CS-3			**0.667**		0.630	
R-1				**0.621**	0.664	
R-2				**0.622**	0.604	
R-3				**0.674**	0.632	0.854
R-4				**0.767**	0.711	
R-5				**0.798**	0.701	
Eigen Values	15.932	2.132	1.324	1.117		
% of Variation	24.214	13.412	12.211	10.983		
Cumulative % of Variation	24.214	37.635	49.846	**60.826**		

Eight items were eliminated from the scale because they performed poorly in the analysis. Specifically, they had low factor loadings or they had no clear loading on a particular factor. There are four factors each having Eigen value exceeding one for higher education institution. Eigen values for four factors are 15.932, 2.132, 1.324 and 1.117respectively. The 32 items were subjected to EFA and a final four-factor model was estimated. The resulting scale was composed of 24 four items. The four-factor solution accounted for 60.826 % of the total variance, and exhibited a KMO measure of sampling adequacy of 0.723. It is a pretty good extraction because we are able to economize on the number of choice factors (from 32 to 4 underlying factors), we lost 39.174 % of information content for choice of variables. The percentages of variance explained by factors one to four are 24.214, 13.412, 12.211and 10.983 respectively. Large communalities indicate that a large number of variance has been accounted for by the factor solutions. Varimax rotated factor analysis results for higher education institution is shown in table-3 which indicates that after 4 factors are extracted and retained the communality is 0.621 for variable1, 0.632 for variable 2 and so on. It means that approximately 60.826 % of the variance of variable1 is being captured by 4 extracted factors together. The proportion of the variance in any one of the original variable which is being captured by the extracted factors is known as communality (Nargundkar, 2002). The Cronbach alpha figures of 0.947 0.827, 0.813 and 0.854 suggest that the items represent reliable measures for each of the four dimensions and thus support the modified SERVQUAL instrument. The resultant empirical factor structure indicated that the Competence – Personal interaction items combined to form a first factor while some other factors Physical aspects, Course structure and Reliability formed the second, third and fourth factor respectively.

Factor -1, combines items of two theoretical different dimensions: Competence and Personal interaction, a careful study of these eleven items shows that all of them refer direct to the competence and personal interaction with students of the university as whole. This factor accounted for the largest proportion, that is, 24.214% of the total explained variance. We can term this dimension competence and personal interaction. The results show that students are more curious to get competent teachers and effective communication with them. Factor-2, physical aspects, is loaded with items describing the tangible cue associated with university's service delivery system. Factor-2 explained 13.412% of the variance and was constructed by five scale items. Factor-3 is loaded with variables pertaining to course structure. This factor includes variables linked to updated syllabus; design relevant course curriculum; and encourage teamwork and communication skill to the students in a right manner. This dimension explained 12.211% of the variance and was constructed by three scale items. Finally, Factor-4, reliability includes items related to the deliver service on time, ability to solve complains of the students, perform right the first time, university promises to do something by a certain time and teachers solve the problems of students. Finally, the fourth factor, reliability, explained 10.983 % of the variance, and encompassed five items related to the reliability.

Reliability and validity: Internal consistency was measured by computing Cronbach's alpha for each multi-item scale. Reliability coefficients were uniformly above the recommended level of 0.08(Nunnally, 1978) and compare well with reported alpha coef-

ficients in the service quality literature (Morales et al., 1998) and in consumer research (Peterson, 1994). Construct reliabilities were computed for the overall scale as well as at the dimension level. The results of the test indicated that the modified SERV-QUAL model is a very much reliable instrument, registering an overall Cronbach alpha value of 0.9548. Hence, the internal consistency reliabilities of the measures used in this study were all acceptable. Next, the validity of the instrument is assessed using two methods; content validity and discriminant validity. Content validity refers to the degree which an instrument covers the meaning of the concepts included in a particular research (Babbie, 1992). For this study, the content validity of the proposed instrument is adequate enough because the instrument has been carefully constructed, supported by an extensive literature review. Now, we also endeavored to test the discriminant validity of this instrument. Discriminant validity gauges the extent to which measures of 2 different constructs are comparatively distinctive from each other, and that their correlation values are neither an absolute value of 0 nor 1 (Campbell and Fiske, 1959). A correlation analysis was run on all the dimensions of shopping mall motivations and the results are as presented in Table-5. It is found that all the dimensions are not perfectly correlated as their correlation coefficients fall between 0 and 1, hence establishing the discriminant validity of the higher education service quality model.

Table 5: Correlation results

Dimensions	Competence-Personal interaction	Physical aspects	Course structure	Reliability
Competence-Personal interaction	1.000			
Physical aspects	0.450**	1.000		
Course structure	0.433**	0.532**	1.000	
Reliability	0.713**	0.436**	0.642**	1.000

**Correlation is significant at the 0.01 level (2-tailed).

Relative importance of the four dimensions: In order to determine the relative importance of the six dimensions in influencing customers' overall quality perceptions we regress the overall quality assessment scores on the service quality score for the individual dimensions. The results of such a regression analysis are shown in table-6. The adjusted R^2 value is statistically significant, and similar to those obtained by (Parasuraman *et al.* 1988). The combined dimension, competence - personal interaction is most critical dimension for students. Physical aspect is the second most important dimension. A striking result in terms of the dimensions in predicting overall service quality is that course structure and reliability are the least important dimensions for graduate students.

Table-6: Relative importance of the four dimensions in predicting overall service quality

Dimensions	Standard Coefficient	Significance Level	Adjusted R^2
Competence-Personal interaction	0.542	0.000	
Physical aspects	0.265	0.000	0.934 (p<0.000)
Course structure	0.212	0.000	
Reliability	0.176	0.000	

Discussion: The result obtains from applying exploratory factor analysis to our data suggests that the theoretical factor structure consisting of six factors (Physical aspects, reliability, competence, personal interaction, course structure and policy) could not empirically replicate. The empirical factor structure consists of four dimensions being one of them a composition of four theoretical competence and personal interaction dimensions. The only item that loads significantly in two factors does not complicate the interpretation. This item measures the ap-

pearance of professor and this is perceived as both a physical evidence of the service and a characteristics of professor themselves. Thus it seems theoretically logic to found this item loading onto these two different factors. The confirmatory factor analysis results provide strong support for the four dimensional structure of service quality of higher education choice is closely related to the perceived quality of the education provided by the institution (Hampton, 1993; Cook and Zallocco, 1979; Punji and Staelin, 1978: Vaughn *et al.,* 1978). Surprisingly, faculty is not the most important factor in predicting service quality for graduate students. Its third position from four does not means that it is not important. Even small, the regression coefficient is statistically significant and its simple correlation is also significant. Therefore, while faculty is apparently one of the least important dimensions in the model setting it is by no means unimportant.

Conclusions: Delivering quality service has become an important goal for most universities. This study represents an important starting point in the development of valid and reliable measures of higher education institutions service quality. It contributes to the marketing and educational literature by introducing a new measure that provides both researchers and practitioners with more specific information concerning service quality's effect on students' satisfaction with higher education institutions' services. In particular it suggests that higher education institutions service quality can be measured with a four dimension scale where competence-personal interaction is the most important for graduate students. In practice, the importance of this dimension points to the need for stronger management emphasis on service dependability of personalized interest when interacting with graduate students. Although the results of this study provide valuable insight into relationship of student satisfaction with higher education institutions' services, one obvious limitation is its external validity. Since this study is based on a few higher education institutions, the generalizability of findings beyond an institutions setting must be viewed with some caution. The external validity of four our measure cannot be claimed until a series of follow-up studies are conducted in different universities settings. As competition for students has escalated among universities, student loyal has received increased attention. Since service quality and student satisfaction are important factors in retention and loyalty, it is important that faculty and institutions measure service quality and use tools of continuous improvement. Quality is what our customers tell us it is, not what we say it is. Progress can only be determined and improved by measurement (Coates, 1990). This study is an attempt to measure service quality in higher education institutions in Ludhiana, Punjab.

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