Journal of Modelling in Management

Effect of student perceived service quality on student satisfaction, loyalty and motivation in Indian universities: Development of HiEduQual

Subrahmanyam Annamdevula, Raja Shekhar Bellamkonda,

Received 29 January 2014
Revised 17 October 2014
Accepted 11 December 2014

Effect of student perceived service quality on student satisfaction, loyalty and motivation in Indian universities

Development of HiEduQual

Subrahmanyam Annamdevula
School of Business Studies, Central University of Karnataka, Gulbarga, India, and
Raja Shekhar Bellamkonda
School of Management Studies, University of Hyderabad, Hyderabad, India

Abstract

Purpose – This paper attempts to develop and validate a service quality instrument called HiEduQual to measure the perceived service quality of students in higher education institutions. This paper aims to propose a structural model by examining the theoretical and empirical evidences on the relationships between students' perceived service quality (SPSQ), students' satisfaction (SSt), students' loyalty (SL) and students' motivation (SM).

Design/methodology/approach – The paper uses survey research design to gather data regarding attitudes of students about quality of service, satisfaction, motivation and loyalty from seven public universities in India and tests the relationships between these variables using structural equation modeling.

Findings – The paper identifies a model with six-structured dimensions containing 23 items for HiEduQual. It proved the direct positive effect of the perceived service quality of students on satisfaction, loyalty and motivation. The paper also supports the partial and complete mediation role of students' satisfaction between perceived service quality of students, their loyalty and motivation toward services being provided by the universities. The competing Model 1 (M1) with partial mediation role of students' satisfaction between students' perceived service quality, loyalty and motivation was proved as the best among the alternative models.

Research limitations/implications – The paper developed and tested a new measurement instrument that covers all the service aspects experienced by the student as primary customer in higher education. Further studies can also measure service quality of the universities in the perspective of other key stakeholders. The authors would recommend studying other possible antecedents which would have influence on satisfaction motivation and loyalty.

Practical implications – The findings suggested that it would be worthwhile for university leaders to make proper allocation of resources, to provide better educational services including support services and facilities. It is believed that this paper has a significant competence for engendering more precise applications related to quality of services, especially concerning students' satisfaction, loyalty and motivation.

Journal of Modelling in Management
Vol. 11 No. 2, 2016
pp. 488-517

1746-5664
DOI 10.1108/JM2-01-2014-0010

The authors would like to thank the students for their participation in the survey. The authors are also indebted to the editor and reviewers for their encouragement and support during the review process. The authors contributed equally to this paper, and order of authorship was decided by rolling dice.

Social implications – The changing nature and need of higher education services and increase in competitive intensity necessitates higher performance levels in the Indian higher education (universities). These can only be achieved through a better understanding of the expectations of students and the importance placed by them on aspects such as teaching, administrative services, academic facilities, campus infrastructure, support services and internationalization. The paper identified that student perceived service quality is a key antecedent to student satisfaction, motivation and loyalty, which conveys that service quality is an important construct.

Originality/value – Previous studies have primarily focused on the relationship between service quality, satisfaction and loyalty. Along with the above, this paper includes students' motivation and assesses the effect of service quality and satisfaction on motivation which was not previously used in services marketing research, especially in higher education sector. Higher education service holds some unique features like customers' (student) cognitive participation in the service process, requirements of the students to be fulfilled by different parties and long-term continuous services. All these features require student participation. The results indicate that quality of academic and non-academic services play a vital role in motivating students to perform better in their academics.

Keywords Student motivation, Student loyalty, Student satisfaction, HiEduQual, Structural model, Student perceived service quality

Paper type Research paper

1. Introduction

Quality, as a concept, is generally easier to define in a manufacturing setting. However, the concept is much more difficult and complex to define in the service sector, which is generally referred to as Service-Quality. In the current socioeconomic context, the service sector has become progressively more important (Seth *et al.*, 2005). Continuous improvement of customer (user) service is essential for successful development of business in today's highly competitive, dynamic and complex business environment (Bolton *et al.*, 2004; Kotler, 2000). There is no escape from it even for philanthropic areas, leave alone higher education.

Higher education plays a vital role in the development of a country, as it enhances social, cultural and economic development and promotes active citizenship while inculcating ethical values in the citizens. Numerous studies have identified the importance of service quality and its measurement, in higher education (O'Neill and Palmer, 2004; Parri, 2006; Quinn *et al.*, 2009). However, there is no consensus about the dimensions and antecedents of student perceived service quality (Sultan and Wong, 2012).

There has been rapid development in higher education in India in the past two decades (Gupta and Gupta, 2012). At present, there are over 700 universities in the country and University Grants Commission (UGC) plans to establish more in the near future. Unfortunately, this expansion comes with a variety of problems, such as inconsistent quality of education, lack of resources and capacity, regulatory difficulties, etc. But, yet, the future holds great potential and the Indian Government is rightly focusing on improvement and growth of the higher education system. Though this aggressive growth is satisfying the market demand, it has certain lacunas also. The Indian education system has to guarantee quality and excellence in education which cannot be compromised at any cost. In this context, the present study explores the factors affecting the quality of higher education and provides a framework to measure service quality. The study also aims to develop a structural model to identify the

relationships between the student perceived service quality, satisfaction, loyalty and motivation.

Service quality in the educational sector has been the subject of numerous studies, given its ability to influence the outcome. Quality in higher education is a complex and multi-faceted concept, and there is no single reliable definition of quality (Harvey and Green, 1993). As a consequence, consensus concerning "the best way to define and measure service quality" does not exist yet (Clewes, 2003). However, researchers recognized the importance of measuring service quality in higher education and they made an effort to define it in their own words. Rowley (1996) defines Services-Quality as the difference in customers' perceptions between performance and expectation. Oldfield and Baron (2000) define Service-Quality in three dimensions: processes, interpersonal factors and physical evidence, while Quinn *et al.* (2009) describe higher education operations in three broad categories of educational or instructional, administrative and auxiliary processes from a Service-Quality point of view.

The satisfaction concept has been extended to the context of higher education. The still limited amount of research suggests that student satisfaction is a complex concept, consisting of several dimensions (Marzo-Navarro *et al.*, 2005; Richardson, 2005). By referring to Oliver and DeSarbo's (1989) definition of satisfaction, Elliott and Shin (2002) describe student satisfaction as:

> […] the favorability of a student's subjective evaluation of the various outcomes and experiences associated with education. Student satisfaction is being shaped continually by repeated experiences in campus life.

Studies focused on student loyalty in the higher education sector help college administrators to establish appropriate programs that promote, establish, develop and maintain successful long-term relationships with both present and former students. In educational services, loyalty requires developing a strong relationship with students who eventually provide the financial basis for future university activities. Students' loyalty creates a brand image for an educational institute during and after their campus life. Therefore, student loyalty refers to loyalty both during and after a student's period of study at an educational institution (Hennig-Thurau *et al.*, 2001).

To date, the study of service quality, satisfaction and loyalty issues have dominated the services literature. The relationships between these constructs has shown its role and importance in management and marketing literature (Caruana, 2002; Cronin and Taylor, 1992; Nguyen, 2009), but the relationships between these three concepts are ambiguous (Mosahab *et al.*, 2010). All the efforts and discussions made by the many researchers enable to discriminate between these three constructs and have resulted in an emerging consensus as their interrelationships.

Another important concept measured in this study is student motivation in the higher education service. Studies rarely focus on the customer motivation because customers are primarily motivated by their needs. In this situation, the process starts with needs and ends with purchasing of the service/product. The satisfaction with service brings customer for repetitive purchases. So marketing researchers focused on service quality, satisfaction and loyalty as key concepts for organizational growth and development. Unlike other services, higher education has some unique features like:

- customers' (student) cognitive participation in the service process;
- the needs of the students are fulfilled by different service providers; and
- long-term and continuous services.

The motivation of the student is highly essential for cognitive involvement in lengthy and continuous process of education. It is a cyclic process that when the educational organization provide better services to the students, they get motivated to participate in the education process, which, in turn, improves the quality of educational outcome (Stukalina, 2010). The latter authors, however, point out that educational services also differ from other professional services in several ways: Educational services play a central role in the students' lives and students require huge amounts of motivation and intellectual skills to attain their goals (Gruber *et al.*, 2010). Hence, the present study has considered student motivation as an essential factor in quality evaluation and examined the relationships between service quality, satisfaction and motivation.

In this context, this paper is an attempt to develop a model that embraces both second-order measurement model and structural model which measures the relationships between student perceived service quality, student satisfaction, loyalty and motivation. In the first stage of this research, measurement model that measures the student perceived service quality is developed. It has been tested for validity and reliability using exploratory and confirmatory factor analysis. In the second stage, the structural model is developed with proposed relationships between the constructs.

Indeed, even a passing evaluation of the literature reveals numerous conflicting results and no significant study has simultaneously compared the relative influence of service quality and satisfaction on loyalty and motivation. Hence, the research both synthesizes and builds on the efforts to conceptualize the effects of student's perceived service quality and satisfaction on the student's loyalty and motivation. The study builds on recent advances in service marketing theory and assesses the relationship between these four constructs in Indian higher education sector. Two competing models are developed and compared to the theoretical model. As the theoretical model (M_T) was proposed to test the complete mediation role of student satisfaction between student perceived service quality and loyalty and motivation (Figure 2), the first competing model (M_1) was proposed to test the partial mediation role of student satisfaction (Figure 3) and the second competing model (M_2) was proposed to test the direct relationship of student's perceived service quality with students' satisfaction, loyalty and motivation (Figure 4).

2. Literature review

The sole purpose of this research is to develop and validate the instrument HiEduQual and test the structural model which represents the causal relationships between the student perceived service quality, satisfaction, loyalty and motivation. Following is a brief overview and discussion of main concepts and the interrelationships between them.

2.1 Service quality

The quality concept which is an established phenomenon in the management literature was first suggested by Juran (1974) and Deming and Edwards (1982); however, Service-Quality is relatively a new concept, which was introduced by Gronroos (1984)

and Parasuraman *et al.* (1988). In the past 20 years, service quality was talked much about by researchers, and it has become an established concept because of the dynamic global business requirements. A service is an activity or series of activities of more or less intangible nature. It normally, but not necessarily, takes place in interactions between customers and service employees and/or physical resources or goods and/or systems of the service provider (Shahin, 2006). The conceptualization and measurement of service quality became a central issue in services marketing research. The major contribution in this area is the five-factor SERVQUAL model developed by Parasuraman *et al.* (1988), three dimension model by Groonros (1984, 1990), a multi-level service quality model by Dabholkar *et al.* (1996) and the recent contribution is the hierarchical model by Brady and Cronin (2001). However, these models have been criticized in terms of applicability across different sectors.

2.2 Service quality in higher education

Numerous studies have been carried out in the higher education sector by adopting SERVQUAL model (Chua, 2004; Cuthbert, 1996; Oliveira and Ferreira, 2009; Pariseau and McDaniel, 1997). With the criticism of application of generic models in higher education sector, alternative models and measurements were developed (Abdullah, 2006; Clewes, 2003; Mahapatra and Khan, 2007; Senthilkumar and Arulraj, 2011). Clewes (2003) developed student-centered model of service quality in higher education that has three clearly differentiated stages in the postgraduate students' service-quality experience. First, the pre-course position, which is centered on service expectations; second, the in-course experience; and third, post-course service value assessment. Abdullah (2006) proposed HEdPERF (Higher Education PERFormance), a new and more comprehensive performance-based measuring scale that attempts to capture the actual determinants of service quality within the higher education sector. The 41-item instrument has been empirically tested for unidimensionality, reliability and validity using both exploratory and confirmatory factor analysis. Mahapatra and Khan (2007) evolved a systematic integrated approach for modeling customer evaluation of service quality applied to the technical education system through a survey instrument known as EduQUAL, specifically proposed for the education sector, is used to measure the satisfaction level of four key stakeholders, namely, students, alumni, recruiters and parents. On the other hand, recently, Senthilkumar and Arulraj (2011) have worked on this issue and developed a research model "SQM-HEI" (Service Quality Measurement in Higher Education in India), which measures the quality of higher education. The model focuses on three dimensions: teaching methodology (TM), environmental change in study factor (ECSF), disciplinary action (DA) and placement as the mediating factor and the outcome as the quality education.

Nevertheless, measuring service quality in higher education sector is a difficult task, as it has unique characteristics and dimensions (Subrahmanyam *et al.*, 2013). There is also extensive literature on the causes and consequences of quality education (Blass and Weight, 2005; Chua, 2004; Cornuel, 2005; Oliveira and Ferreira, 2009).

2.3 Relationship between service quality, satisfaction, loyalty and motivation

The increasing amount of literature on service quality, customer's satisfaction and loyalty marks its importance in marketing literature. The importance of the relationship

between satisfaction and loyalty has been identified by the researchers (Chaudhuri and Holbrook, 2001; Oliva *et al.*, 1992).

Ample studies have empirically verified the relationships between service quality, satisfaction and loyalty in management/marketing (Bloemer and Ruyter 1998; Caruana 2002; Cronin and Taylor, 1992; Gronholdt *et al.*, 2000; Mosahab *et al.*, 2010) but few in higher education sector (Peng and Samah, 2006; Rowley, 1996; Tsuji *et al.*, 2007; Yunus *et al.*, 2010). The student satisfaction with quality services provided by the institution has been studied by the researchers (Aldridge and Rowley, 1998; Alves and Raposo, 2007; Douglas *et al.*, 2006; Petruzzellis *et al.*, 2006). Studies have also been conducted to measure student loyalty in the higher education sector, as it implies behavioral intentions, retention and word of mouth publicity (Clemes *et al.*, 2013, 2008). Most of them found the mediator role of satisfaction in the influence of service quality on loyalty in higher education (Chen *et al.*, 2007; Clemes *et al.*, 2013; Huili and Jing, 2012; Jiewanto *et al.*, 2012). These studies have established that core academic services including support and other peripheral services also play an important role in student's satisfaction and loyalty.

Huili and Jing (2012) developed a customer satisfaction index model about postgraduate education service quality by using structural equation modeling method. Authors identified the relationships between nine constructs, which includes perceived service quality, student satisfaction and student loyalty. The relationships between these constructs were found positive and student satisfaction plays mediation role between perceived quality and student loyalty.

According to Yunus *et al.* (2010), students are the primary customers in higher educational institutions as their needs would be fulfilled by the other relevant groups, such as the need to acquire a valuable academic knowledge and good service quality. It is the institution's responsibility to provide the quality degree program or particular course. On the other hand, Rowley (1996) stated that along with academic program the study environment, opportunities for students' self-improvement, the facilities provided, services and other aspects are also influencing the student satisfaction. When dealing with facilities, students consider a quality university as being one that has an excellent library, sport, recreational, computing, classroom and academic facilities (Peng and Samah 2006).

The quality in academic performance/achievement of the student is highly affected by the teaching and classroom environment, student motivation, emotional and cognitive factors (Alpert and Haber, 1960; Brown and Holtzman, 1966; Covington, 2000; Eccles and Wigfield, 2002; Entwistle and Entwistle, 1970; Meyer and Turner, 2006; Pascarella, 1980; Wolters and Pintrich, 1998). Over the past decades, studies have been conducted to answer the question about how motivation facilitates learning and how it improves the student performance in educational settings (Covington, 2000; Eccles and Wigfield, 2002). Very few studies addressed the question: how to motivate students and what factors influence the motivation level of students. The studies focus on how to study habits, methods, anxiety or motivation levels, which would influence the academic performance but not on the factors causing anxiety or the motivation levels. However, there was no consensus on the issue of how students will get motivated to deep engagement in learning.

Wolfgang and Dowling (1981) stressed that higher education institutions must assess the student needs and motivations and make appropriate adjustments in support

services, administrative procedures, programming and the teaching-learning process. Poor services by the academicians, administrators and other supporting staff leads student enragement, which ultimately results in poor academic performance. Hufton *et al.* (2003) pointed out that the interrelationship among the affairs, processes and other academic-related tasks can facilitate in developing higher motivation for learning. Hence, the quality education resulted from overall services provided by the institution include teaching, classroom environment, administrative services, support services and facilities.

Therefore, there is a consensus among the researchers with regard to the causal order between these four constructs. With this theoretical background, the present study proposed a theoretical model (M_T) to test the complete mediation role of students' satisfaction between students' perceived service quality and loyalty and motivation.

Hypotheses intended for theoretical model M_T:

H1. Student satisfaction fully mediates the relationship between student perceived service quality and student loyalty (SPSQ → SSt →SL).

H2. Student satisfaction fully mediates the relationship between student perceived service quality and student motivation (SPSQ → SSt →SM).

Literature also supports the partial mediation role of satisfaction between service quality and loyalty when service quality has direct relationship with loyalty (Bloemer and Ruyter, 1998; Caruana, 2002). Bloemer and Ruyter (1998) have proposed a model which presents the causal effect of mental picture, service quality and customer satisfaction on customer loyalty. The findings of this study have shown that the service quality influences loyalty both directly and indirectly (through satisfaction). In the same way, Caruana (2002) also has confirmed the mediator role of customer satisfaction in the effect of service quality on service loyalty. In this way, studies have empirically proven the full and partial mediation role of satisfaction between service quality and loyalty. Hence, the study has proposed a competing model (M_1) to test the two hypotheses below of partial mediation role of student satisfaction between student perceived service quality and loyalty (Figure 3).

Hypotheses intended for competing model M_1:

H3. Student satisfaction partially mediates the relationship between student perceived service quality and student loyalty (SPSQ → SSt → SL when SPSQ → SL).

H4. Student satisfaction partially mediates the relationship between student perceived service quality and student motivation (SPSQ → SSt → SM when SPSQ → SM).

Through improvement of conceptual foundation and empirical evidence, the majority of recent publications (Carrillat *et al.*, 2007; Dabholkar *et al.*, 2000; Iacobucci *et al.*, 1995; Yavas *et al.*, 2004; Zeithaml *et al.*, 2008) consider service quality as an antecedent to customer satisfaction. Further support can be found in the higher education literature (Ahmed *et al.*, 2010; Clemes *et al.*, 2013; Guolla, 1999), which examined that students' perceived service quality is the main determinant of satisfaction.

Customer loyalty can be viewed as the strength of the relationship between an individual's relative attitude and repeated patronage. The central theme of any

organization relies on development, maintenance and enhancement of customer loyalty toward its product or services (Dick and Basu, 1994). Studies focus on students' loyalty in higher education sector, which helps college administrators to establish appropriate programs that promote, establish, develop and maintain successful long-term relationships with both current and former students. Higher quality of perceptions positively affects the intended behavior of students (Boulding *et al.*, 1993; Zeithaml *et al.*, 1996). The quality of teaching and the students' emotional commitment to their institution are crucial for student loyalty (Hennig-Thurau *et al.*, 2001).

Numerous studies have been done by educational researchers to identify the aspects which enhance academic achievement and prevent students from dropping out of colleges and institutes (Bean and Metzner, 1985; Frankola, 2001; Pascarella, 1980; Tinto, 1987). Most of these studies revealed that educational outcome is not only influenced by cognitive factors but also by emotional and motivational factors. Students with high motivation level will learn more and will be more successful than those with less motivation (Frankola, 2001; LaRose and Whitten, 2000). Hence, motivation is an important concept in higher education sector and it must be rigorously studied to understand the antecedents of students' motivation. Therefore, the research intends to study the impact of service quality on students' motivation in the higher education sector.

Based on the above-mentioned theoretical considerations, the study proposed another competing model (M_2) to test the direct relationship of student perceived service quality with student satisfaction, loyalty and motivation (Figure 4).

Hypotheses intended for competing model M_2:

H5. Student perceived service quality is positively related to student satisfaction (SPSQ → SSt).

H6. Student perceived service quality is positively related to student loyalty (SPSQ → SL).

H7. Student perceived service quality is positively related to student motivation (SPSQ → SM).

3. The research

The key concepts in this study are student perceived service quality (SPSQ), student satisfaction (SSt), student loyalty (SL) and student motivation (SM). This study used descriptive research design to gather data regarding attitudes of students about service quality, satisfaction, motivation and loyalty toward university services and to measure the relationship between these variables in the higher education sector to add empirical evidence to the existing field of knowledge.

The total analysis was done in two stages. In stage one refers the various steps in the process of development and validation of the instrument HiEduQual. Exploratory and confirmatory factor analyses are used to extract the factors and to assess the validity and reliability of the instrument. In Stage 2, structural equation modeling was used to measure the causal relationship between the latent variables. The study presents a structural model that begins with theoretical justification to define the nature of the focal constructs and then uses a series of empirical tests to support the causal direction between the constructs and their measures (Coltman *et al.*, 2008).

The first-order and second-order measurement models were developed using confirmatory factor analysis specifying that scale items are reflective indicators of their corresponding latent constructs and allowing the latent constructs to inter-correlated (Parasuraman *et al.*, 2005). Specifying scale items as reflective or formative indicators to latent construct is a challenging and important issue (Coltman *et al.*, 2008; Jarvis *et al.*, 2003). The model is based on the review of literature which provides a set of decision rules for deciding whether the measurement model should be a formative or a reflective one (Jarvis *et al.*, 2003).

The decision to use reflective approach to develop the scale to measure the attitude of students on services being provided by the university, satisfaction, loyalty and motivation is consistent with key four criteria recommended by Jarvis *et al.*, (2003) for determining specification over the formative specification: The direction of causality flows from the construct and its indicators, inter-changeability and homogeneity of the indicators within each construct, sufficient covariance among the indicators within each construct and the expectation that indicators within each dimension (e.g. teaching and course content) are likely to be affected by the same antecedents (e.g. teacher and course characteristics) and have similar consequences (e.g. response and practices). Similarly, second-order measurement model was developed by considering that all first-order latent constructs are reflective indicators of a second-order student perceived service quality (SPSQ). This assumption is conceptually and empirically supported by the literature (Parasuraman *et al.*, 1988, 2005).

The results substantiate the decision on reflective approach to develop measurement models. All the items of concern construct have high positive inter-correlations and all the items of each construct have similar signs and significance of relationships with the antecedents/consequences of the construct. The items of each construct were measured for internal consistency via Cronbach's alpha, construct reliability, the average variance extracted and factor loadings. Content validity is established based on theoretical considerations and assessed empirically via convergent and discriminant validity.

3.1 Survey instrument

The survey instrument called HiEduQual was developed in multiple stages and with the consideration of valuable advises given by the researchers. Total 57 items (indicators) were generated from in-depth literature review that focuses on group discussions and expert opinion, 42 of which were related to services being provided by the university and measured the student perceived service quality. The questionnaire was comprehensive and covers all the academic and non-academic services experienced by the student, being the primary customer in the higher education sector. Five items were used to measure the student motivation. All service quality and motivation indicators were measured on a seven-point Likert scale that varied from 1 = strongly disagree to 7 = strongly agree. Four-item scale was used to measure student loyalty by the seven-point Likert scale that varied from 1 = not at all to 7 = very frequent and six to measure student satisfaction through seven-point Likert scale that varied from 1 = highly dissatisfied to 7 = highly satisfied (see Appendix).

3.2 The sample

The respondents of the study are senior students who have completed at least one year of education in the university. A non-probability purposive sampling method was used

to collect the sample from seven universities in Andhra Pradesh, India. Seven universities were selected based on multiple criteria of: universities established before the year 1990, National Assessment of Accreditation Council (NAAC) accreditation and geographical representation.

Among the 43 universities in Andhra Pradesh, 15 universities were established before the year 1990. Among these, ten universities are accredited by NAAC as on March 2011. The rationale to choose the universities set up before the year 1990 and NAAC accredited is that these universities are well established in terms of infrastructure and other facilities. Seven universities were selected from the remaining ten universities, based on the criteria of geographical distribution in three regions, namely, Telangana, Andhra and Rayalaseema.

Of the seven universities, three universities, namely, University of Hyderabad, Osmania University and Jawaharlal Nehru Technological University Hyderabad are from Telangana region. Two universities, Andhra University and Acharya Nagarjuna University, are from Andhra region and the remaining two universities, Sri Venkateswara University and Sri Padmavathi Women's University, are from Rayalaseema region.

The total valid sample of 2,565 was collected with 85 per cent response rate. For using structural equation modeling (SEM), it is required to have minimum sample size of 500, when the models have a larger number of constructs (Hair *et al.*, 2008). Respondents are almost an equal split between males (48.5 per cent) and females, 68 per cent of the students are in the age group of 18 to 22 years. Respondents belong to various department/schools across the university. Demographic profile of the total respondents of four universities is shown in Table I.

A great deal of effort has been put to minimize common method bias (CMB) to make the research more effective. The extent of the bias caused by common method variance influences (a) measures used in the field and (b) relationships between these measures (Podsakoff *et al.*, 2003). As recommended in the literature, study implemented *ex ante* approaches, to minimize the common method bias, in the research design stage by constructing the key measures of dependent and independent variables from different sources of information, and a number of procedural remedies have been considered in designing and administering the questionnaire. As a part of *ex post* statistical approaches, this study examined the data for common method variance that influences structural results using Harman's one-factor test. First, six factor model was tested

Demography	Category	Frequency	(%)
Gender	Male	1,244	48.5
	Female	1,321	51.5
Age	18-22	1,743	68.0
	23-27	774	30.2
	Above 27	48	1.8
Department	Sciences	912	35.6
	Social sciences	508	19.8
	Humanities	205	8.00
	Engineering	671	26.2
	Management	269	10.5

Table I. Demographic profile of respondents

using exploratory factor analysis by fixing the factor number to one, and this single factor explains only 28 per cent of variance, which indicates that the total variance explained by one factor is significantly less than 50 per cent (Chang *et al.*, 2010). Second, Harman's one-factor test was performed using confirmatory factory analysis. Results of χ^2 difference test indicate that common bias may not be a serious problem. Although Harman's method is a useful diagnostic test, it is limited to control the effects of common method variance (Podsakoff *et al.*, 2003). Hence, study integrated a common method factor into measurement model along with the six factors of functional interest to the study. It was specified that the method factor to be uncorrelated with the other constructs and allowed each item to load on the method factor, as well as its respective underlying factor (Podsakoff *et al.*, 2003). The results signified that both the measurement models fit the data well and are scientifically evident for convergent and discriminant validity. However, standardized loadings were diminished with the inclusion of method factor, but the difference is not more than 0.20. χ^2 value and AVE between the constructs also slightly decreased as the observed indicators were simultaneously explained by its constructs and the common factor. This suggests that the data and measured relationships may not be potentially influenced by the common method variance.

A preliminary analysis of the data was conducted to test the multivariate normality, linearity and outliers to meet the basic assumption of normality and ensure the usage of multivariate techniques like factor analysis and SEM. An assessment of normality was done through kurtosis and skewness tests. Normally, distributed data have skewness and kurtosis ranges between +2 and −2 (Kline, 2005). Kolmogorov and Shapiro (K–S) method and linearity were measured by Pearson's correlations and a scatter plot (Field, 2005; Hair *et al.*, 2008; Tabachnick and Fidell, 2001). Outliers were detected using Mahalanobis D^2 measure (Kline, 2005). The results of above tests substantiated that the data were normally distributed and the variables have linear relationships. The AMOS output of Mahalanobis D^2 measure found no serious multivariate outliers.

The whole valid sample of 2,565 was divided into two samples based on the geographical region: Sample $n_1 = 1{,}126$ from Telangana region and Sample $n_2 = 1{,}439$ from Andhra and Rayalaseema regions. In the first stage of analysis, these two samples were used to perform the following: the first sample (n_1) was used in an exploratory study to identify the underlying structure of student's perceived quality; the second sample (n_2) was used in a confirmatory study to validate the underlying structure.

3.3 Stage 1: Development and validation of HiEduQual

3.3.1 Exploratory factor analysis (EFA). The sample $n_1 = 1{,}126$ was used for EFA to develop the "HiEduQual" theoretical model to identify the underlying factor structure. A preliminary analysis of the data was analyzed by frequency and percentages. Cronbach's alpha coefficient and critical analysis of correlation of the data matrix were computed to ensure the usage of factor analysis (Hair *et al.*, 2008). The value of coefficient alpha of all the items was above 0.90, which indicates that all the items are internally consistent (Nunnally, 1978). Totally four items were deleted, as the total correlation of these items was less than 0.40 (Hair *et al.*, 2008; Nunnally, 1978). The other statistical prerequisites to continue with exploratory factor analysis are Bartlett test of sphericity, which was significant at 0.001, $\chi^2 = 16{,}303.05$ ($p = 0.000$). The

Kaiser-Meyer-Olkin (KMO) measure of sampling adequacy showed adequate fit (KMO = 0.934), indicating the suitability of factor analysis.

The principal component analysis with subsequent varimax rotation was adopted to reduce the data either into smaller number of variables or into a set of uncorrelated measures for subsequent use in other multivariate techniques (SEM). Three criteria were used to determine the factor structure:

(1) factor loadings more than ±0.40 remained for further analysis in the study;

(2) exclude items which cross-load more than one factor; and

(3) the difference between the cross-loadings should be minimum 0.20 (Hair *et al.*, 2008).

Seven items did not fit these criteria and were deleted for subsequent analysis. The latent root criterion was used to extract the factors; a total of 31 items which grouped under six factors emerged from the factor analysis. The Cronbach's α value of six factors ranged from 0.65 to 0.86, indicating that the scale was internally consistent and reliable (Cronbach, 1951; Nunnally, 1978). Research validation heuristics suggest that for the factor structure to be considered reliable, α should be >0.7 for confirmatory research and >0.6 for exploratory research (Straub *et al.*, 2004). Authors also note that more is not necessarily better with regard to reliability. A very high Cronbach's α (>0.95) may suggest common method bias in the study. Although some of the Cronbach's α values are high, they are not greater than 0.95. The extracted six factors with factor loadings are displayed in Table II.

3.3.2 Confirmatory factor analysis

3.3.2.1 First-order measurement model. The output of exploratory factor analysis was considered as the underlying measurement model for confirmatory factor analysis (CFA), which consists of 31 items with six factors. The sample $n_2 = 1{,}439$ was used to test the "HiEduQual" measurement model for validating the indicators and the dimensions of the model. In the process of validating the first-order measurement model, however, eight items were discarded, as they had high standard residuals (>±0.40) or less standard estimates (<0.50). The assessments of measurement model were done through multiple approaches: construct validity and construct reliability. The construct validity includes face validity, convergent validity, discriminant validity and nomological validity (Churchill, 1979).

Face (validity) validity was examined at the stage of items' generation from extensive review of literature and by adopting changes and suggestions from various experts. The three measures of convergent validity are standardized coefficients (loadings) of the six factors, the average variance extracted (AVE) and construct reliability for each factor.

All the indicators are statistically significant at a level of significance of 0.001 and standard estimations are above 0.50 (ranging from 0.62 to 0.90) (Hair *et al.*, 2008). The AVE and construct reliability (CR) values of each construct exceeded the minimum level of 0.50 and 0.70, respectively. It indicates that measured variables of concern construct share a high proportion of variance in common (Byrne, 2010; Hair *et al.*, 2008).

Discriminant validity was checked with the comparison of variance extracted (VE) estimates for each construct with the squared inter-construct correlations (SIC) associated with that factor. All the extracted variance estimates are greater than squared inter-construct correlations, indicating that each factor is unique and captures

Items		M	SD	Component 1	2	3	4	5	6
Factor 1: Teaching (TC)									
TC1	Teachers' responsive and accessible	4.77	1.66	0.77					
TC2	Course content develops students' knowledge	3.01	1.85	0.75					
TC3	Teachers follow good teaching practices	4.43	1.78	0.74					
TC4	Teachers follow curriculum strictly	4.68	1.71	0.69					
TC5	Continuously evaluate the student's performance	4.09	1.81	0.67					
TC6	Department has sufficient academic staff	4.56	1.96	0.63					
TC7	Teachers treat all students in equal manner	4.41	1.99	0.52					
TC8	Collects feedback to provide better services	5.16	1.69	0.48					
Factor 2: Administrative services (AS)									
AS1	Admin staff provides error-free work	3.92	1.67		0.80				
AS2	Admin staff provides service without delay	3.80	1.80		0.79				
AS3	Admin staff is courteous and willing to help	4.19	1.77		0.74				
AS4	Admin maintains accurate and retrieval records	4.51	1.58		0.73				
AS5	Admin staff accessible during office hours	4.20	1.69		0.64				
AS6	Students informed promptly of changes	4.10	1.76		0.56				
Factor 3: Academic facilities (AF)									
AF1	Classrooms equipped with teaching aids	4.45	1.81			0.67			
AF2	Computer/science labs are well equipped	4.50	1.89			0.64			
AF3	Library has adequate academic resources	4.82	1.61			0.60			
AF4	Library is electronically equipped (E-library)	4.61	1.64			0.59			
AF5	Campus environment is convenient to study well	5.02	1.77			0.58			
AF6	University has adequate auditoriums etc.	5.39	1.57			0.58			
AF7	Maintenance of facilities	4.55	1.59			0.57			
Factor 4: Campus infrastructure (CI)									
CI1	University has sports and recreation facilities	4.83	1.83				0.81		
CI2	University has adequate hostel facilities	4.64	1.93				0.76		
CI3	University has safety and security measures	3.30	1.90				0.74		
CI4	University hostels provide quality food	4.98	1.61				0.52		
Factor 5: Support services (SS)									
SS1	University has adequate amenities	4.28	1.89					0.73	
SS2	University organizes cultural and extracurricular	4.42	1.85					0.69	
SS3	University provides counseling services	5.13	1.78					0.65	
SS4	University provides good medical services	5.17	1.66					0.59	
Factor 6: Internationalization (IN)									
IN1	University promotes international activities	5.24	1.56						0.80
IN2	University has teachers from abroad	5.34	1.53						0.73

Notes: Loadings less than 0.40 are not shown; M = mean; SD = standard deviation

Table II.
The results of exploratory factor analysis

some experience other measures do not. Finally, nomological validity was tested by examining whether the Pearson product-moment correlations between the constructs in a measurement model make sense. The positive significant correlation between the constructs indicates that the constructs have nomological validity (Byrne, 2010; Hair *et al.*, 2008). The above-mentioned results indicate that the 28 items with six dimensions of first-order model are valid and reliable.

As numerous fit indices consider different aspects of fit for SEM (Hair *et al.*, 2008), the study uses three typical fit indices to assess the model fit: absolute fit measures, incremental fit indices and parsimony fit indices. A value of 4.12 for χ^2/df ratio indicates that the model is acceptable. The goodness of fit index (GFI) and root mean square error of approximation (RMSEA) values were above 0.90 and between 0.03 and 0.08, respectively, indicating that the model theory fits the sample data. Further, normed fit index (NFI), Tucker-Lewis index (TLI) and comparative fit index (CFI) were used to assess how well a specified model fits relative to some alternative baseline model. All of these values were above 0.90. Finally, average goodness of fit index (AGFI) and Parsimony normed fit index (PNFI) were used to assess significant improvements over competing models, where the values were close to 0.90 and 0.80, indicating that the model fits well (Hair *et al.*, 2008; Hu and Bentler, 1999).

3.3.2.2 Second-order measurement model. The purpose of the second-order measurement model is to integrate all the service quality factors into one second-order factor that helps to study the hypotheses, as well as for future adoption in structural modeling (Byrne, 2010). The study assumed that all the first-order constructs are integrated into one second-order construct called students' perceive service quality (SPSQ), which was supported by an argument made by Parasuraman *et al.* (1988) that there exists a single overall service quality construct. All the considerations and model fit indices were verified as first-order constructs are indicators of the second-order construct (Figure 1).

All the first-order factors are significantly loaded onto second-order construct. The standard estimates range from 0.62 to 0.85 with all critical ratios above 1.96. The convergent validity measured through the standard estimates of the first-order indicators and AVE are over 0.50 and the CR value exceeds the recommended level of 0.70 (Byrne, 2010; Hair *et al.*, 2008). Table III represents the second-order measurement model fit indices along with the comparison of preceding model fit indices. The chi-square GOF test alone is difficult to use for model fit; therefore, other alternative measures of fit were used to assess. The other fit indices such as RMSEA = 0.051 and GFI, *NFI*, *TLI*, *CFI*, *AGFI* were above 0.90 and PNFI were above 0.80. It indicates that the second-order measurement model has good fit.

3.4 Stage 2: Structural model

The theoretical model (M_T) shows the fully mediated role of students' satisfaction (SSt) between SPSQ and SL and SM (Figure 2). All the fit indices of theoretical model are above 0.90 and RMSEA = 0.050 shows that the model M_T has good fit (Table IV). The estimated coefficients (paths) provide the direct empirical evidence for accepting or rejecting the relationships between the latent variables depicted in the structural model (Hair *et al.*, 2008). The AMOS output showed that all paths proposed in the theoretical model were positive and statistically significant:

- students' perceived service quality is positively related to students' satisfaction (standard estimate: 0.88);
- students' satisfaction is positively related to students' loyalty (standard estimate: 0.71); and
- students' satisfaction is positively related to students' motivation (standard estimate: 0.86).

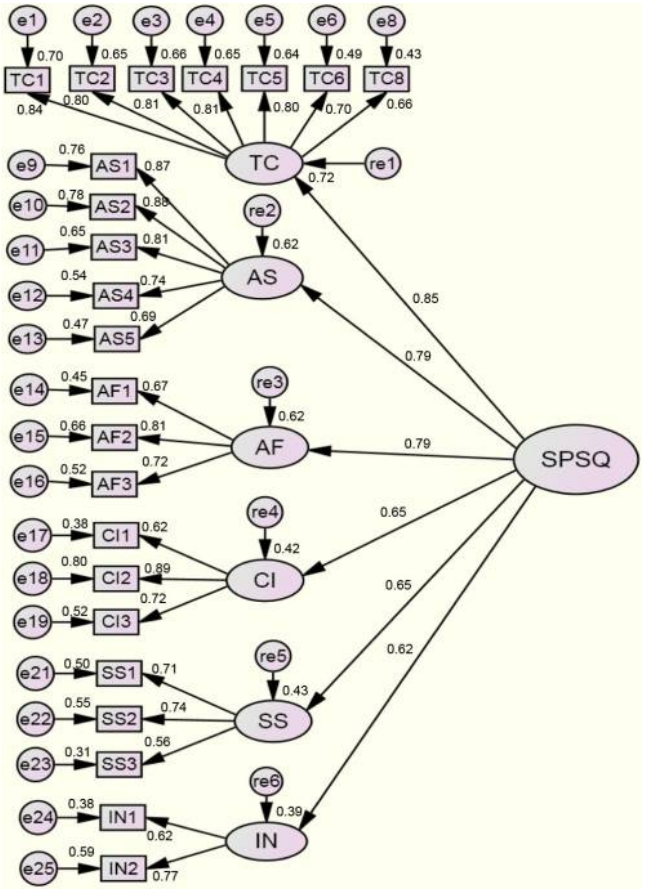

Figure 1.
Second-order measurement model

From the results above, it can be concluded that SSt fully mediates the relationship between SPSQ and SL and SM. Hence, the two hypotheses (*H1* and *H2*) cannot be rejected. After estimating and testing the model indices, the study proceeds to compare this model with two competing models.

3.4.1 Comparing with competing models. A good model with reliable and significant estimates does not support the structural theory. Thus, the study sought to compare a proposed theoretical model (M_T) with two alternative models, that is, M_1 and M_2, where those alternative relations were theoretically endorsed (Hair *et al.*, 2008) (Figures 3 and 4). The objective was to determine the best fitting model among the competing models.

In M_1, the direct relationship was added from SPSQ to SL and SM to test the partial mediation role of SSt between SPSQ and SL and SPSQ and SM (Figure 3).

In M_2, the relationship from SSt to SL and SM was annulled and a direct relationship was added from SPSQ to SL and SM to test the direct influence of SPSQ on SL and SM (Figure 4).

Chi-square (χ^2) difference statistic ($\Delta\chi^2$) test was used to compare the three structural models. The null hypothesis was developed so that no significant difference existed

Table III.
Comparison of first- and second-order measurement model fit indices

Measurement model	χ^2	df	χ^2/df	GFI	RMSEA	NFI	TLI	CFI	AGFI	PNFI
First-order measurement model	887.43 (*p* = *0.000*)	215	4.128	0.948	0.047	0.938	0.944	0.952	0.933	0.797
Second-order measurement model	1,063.86 (*p* = *0.000*)	224	4.749	0.937	0.051	0.925	0.932	0.940	0.923	0.819

between the two nested structural models (denoted as $M_T - M_1 = 0; M_2 - M_1 = 0$). If the null hypothesis was accepted, then the two constrained models were tentatively accepted. The chi-square difference test ($\Delta\chi^2$) between M_T and M_1 ($\Delta\chi^2 = 97.91$; $\Delta df = 2$) suggested that competing model M_1 performed significantly better than M_T. All the relationships in competing Model 1 (M_1) were positive and statistically significant. Figure 3 presents the standard estimates of the relationships between the constructs. Thus, the SSt is supported by the partially mediated role of the relationship between SPSQ → SL and SPSQ → SM. Thus, the *H3* and *H4* were deemed to be accepted.

The parameter coefficients of the competing model M_2 are SPSQ → SSt (standard estimate = 0.89; $p = 0.000$); SPSQ → SL (standard estimate = 0.73; $p = 0.000$); and SPSQ → SM (standard estimate = 0.90; $p = 0.000$) were positive and statistically significant. Hence, the *H5*, *H6* and *H7* were deemed to be accepted. The chi-square difference test ($\Delta\chi^2$) between M_2 and M_1 ($\Delta\chi^2 = 15.31$; $\Delta df = 2$) was significant; therefore, the competing Model 1 (M_1) along with more freely estimated parameters (paths) fits the data better that the competing Model 2 (M_2), and it further suggests that competing model M_1 was performing significantly better than M_2.

The high standard estimate between SPSQ and SSt in theoretical model M_T demonstrates that the service quality is strongly related to the satisfaction (0.88) in the absence of relation with student loyalty and motivation (Sumaedi *et al.*, 2011). It is noted that student satisfaction also has a strong relationship with student loyalty (0.71) and motivation (0.86). Similarly, standard loadings of direct relation from SPSQ to SSt, SL and SM in the competing model M_2 is still better, which indicates that service quality has high influence on satisfaction, loyalty and motivation (0.89, 0.73 and 0.90) (Figure 4). It indicates that the consequence (loyalty or motivation) has a strong relationship with single antecedent (service quality or satisfaction). In the competing Model 1 (M_1), the consequents are explained by service quality and satisfaction simultaneously; hence, they share the total affect on loyalty and motivation.

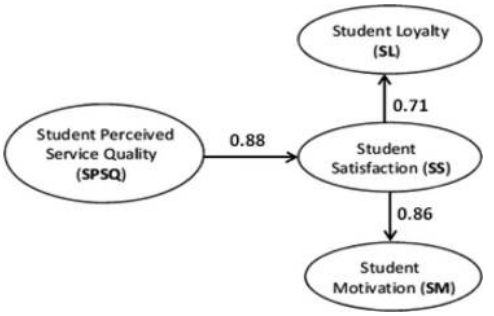

Figure 2.
Theoretical model (M_T)

Table IV.
Model fit indices of the competing models

Model	χ^2	df	χ^2/df	GFI	AGFI	NFI	TLI	CFI	RFI	IFI	RMSEA
M_T	2,198.97	486	4.325	0.910	0.896	0.908	0.925	0.927	0.900	0.927	0.050
M_1	2,101.06	484	4.341	0.914	0.900	0.912	0.925	0.931	0.904	0.931	0.048
M_2	2,116.37	486	4.355	0.914	0.901	0.912	0.924	0.930	0.904	0.930	0.048

Statistical fit indices are necessary to make comparisons between these three models to determine the model that fits best. Table IV presents the fit indices of three competing models, where competing model M_1 had a little better fit than M_T and M_2. Thus, it was concluded that the competing Model 1 (M_1) could be retained as a feasible alternative for acceptance. Therefore, based on the comparative analysis using chi-square difference ($\Delta\chi^2$) statistic test, the study identified that the competing model (M_1), which measures partial mediation role of students' satisfaction between students' perceived service quality and students' loyalty and motivation, significantly performed better than the other two models (Figure 5).

4. Discussion and conclusion

4.1 Theoretical implications

The originality of this research is based on the development of a comprehensive model that examines the factors influencing service quality. Although studies have been conducted on service quality in higher education sector globally, the present study of service quality in Indian universities is significant because the Indian higher education system is one of the largest education systems in the world, having more than 700 universities and face issues related to quality.

The study tests the direct and indirect relationships between the SPSQ, SSt, SL and SM. Three competing models with different type of relationships were developed and the best model identified based on the chi-square difference ($\Delta\chi^2$) statistical tests and model fit. The competing model "M_1" with partial mediation role of

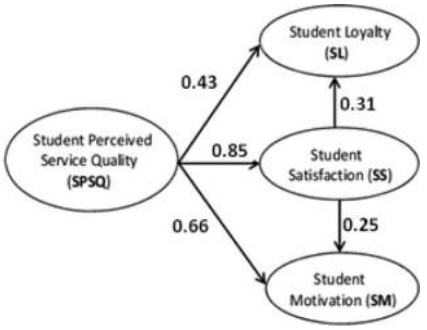

Figure 3.
Competing model 1 (M_1)

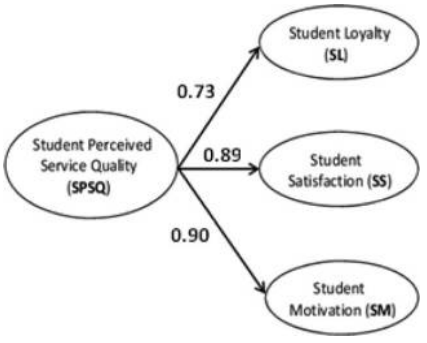

Figure 4.
Competing model 2 (M_2)

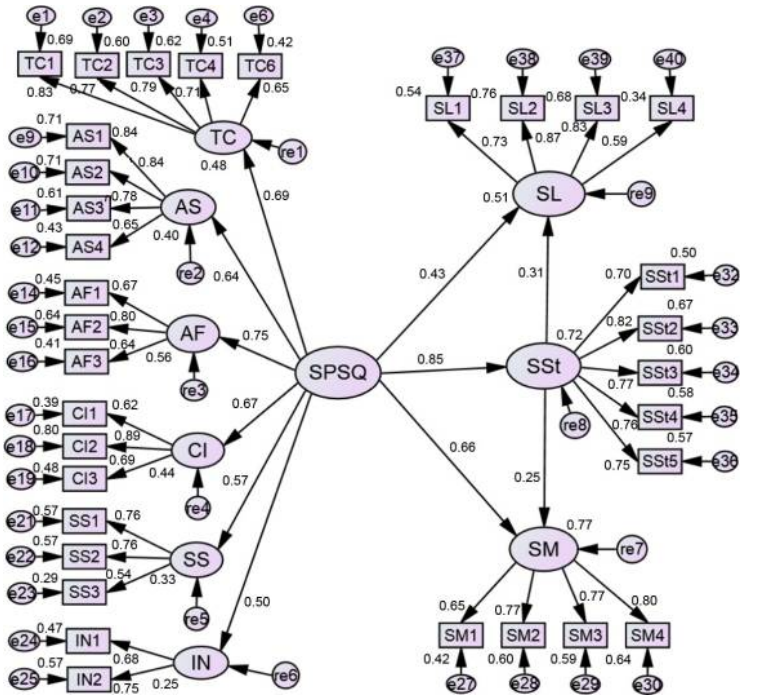

Figure 5.
Results of competing model 1 (M_1)

students' satisfaction between SPSQ and SL and SM was shown to be comparatively better than the other models M_T and M_2.

The findings of the study supported the positive relationships between SPSQ and SSt and SL (*H5* and *H6*) (Bloemer and Ruyter, 1998; Cronin and Taylor, 1992; Parasuraman *et al.*, 1985, 1988). The mediating role of student satisfaction between service quality and student loyalty is also widely accepted as a causal relationship in services marketing literature (Bloemer *et al.*, 1999; Caruana, 2002; Gronholdt *et al.*, 2000; Mosahab *et al.*, 2010; Olsen, 2002). Though studies have proved the mediation role of satisfaction between service quality and loyalty, but it is not well defined whether it is a fully mediation or partially mediation role. This study supports both fully and partial mediating role of satisfaction between student perceived service quality and student loyalty (*H1* and *H3*). Hence, the present study is adding empirical evidence and providing theoretical clarification to the existing field of knowledge on the mediation role of satisfaction between service quality and loyalty.

Further, the study proved SPSQ has a direct positive relationship with SM in the competing model M_2 (*H7*) and full and partial mediation role of SSt between SPSQ and SM in the theoretical model M_T (*H2*) and competing model M_1 (*H4*), respectively. It indicates that perceived service quality is an immediate antecedent to motivation and it also affects motivation through satisfaction (Elliott and Shin, 2002). Thus, the service quality has a positive effect on satisfaction which is a potential consequence of student motivation. Poor services by the academicians, administrators and other supporting staff lead to students feeling estranged, which ultimately results in poor academic

performance (Ahmed *et al.*, 2010; Hufton *et al.*, 2003; Mason, 2012). Quality services could have a direct impact on students' mood, well-being and participation, which in turn builds motivation (Stukalina, 2010; Wolfgang and Dowling, 1981). Hence, service quality and satisfaction play a vital role in student motivation.

In the literature, although the importance of service quality and the student motivation is acknowledged, not much has been done to investigate the causes to student motivation and the relationship between service quality and student motivation. This study revealed and confirmed the existence of the critical relationship among perceived service quality, student satisfaction, loyalty and motivation.

4.2 Managerial implications

The Indian higher education institutions are facing enormous issues related to quality in education. There is an incremental growth in Gross Enrollment Ratio, but there is no much emphasis on the quality in education. The massive expansion of the institutions leads to compromise in quality. The major findings of this research address some important management implications for administrators, academic and non-academic staff of the institutions.

First of all, the exploratory and confirmatory factor analyses have shown that service quality is made up of six latent dimensions (teaching, administrative services, academic facilities, campus infrastructure, support services and internationalization). These results could help leaders of institution to better recognize the factors contributing to service quality, so that they are able to discreetly provide better services that enhance student satisfaction, motivation and loyalty.

From the results of SEM, the service quality acts as a key antecedent to student satisfaction, loyalty and motivation. Therefore, the institution management must strive to improve the quality of services to satisfy and motivate the students. Motivating the students for present and future studies with better participation in the process is equally important to get quality output. The best services also make a student loyal to the institution.

4.3 Theoretical contribution

The research contributes to academic theory by developing the HiEduQual model, which identifies variables and dimensions in student perceived service quality measurement. The contribution to theory development falls mainly within the confines of the quality of services of Indian universities. Structural theory with simultaneous measurement of the direct and indirect relationships between student perceived service quality, satisfaction, motivation and loyalty also adds a new contribution to the existing field of knowledge. The dimensions derived out of this research will contribute to a greater understanding at the generic level of the role played by these constructs in determining the higher education services.

The study contributes methodologically to existing service quality measurement research. Testing and validating the HiEduQual model with data across the state of Andhra Pradesh through vigorous psychometric scale development procedures and methodologies in each phase shows that the HiEduQual instrument is robust. The process of development of alternative competent models with different relationships and identifying the best model was also evident in the exhaustive analysis of the relationships among the constructs.

4.4 Managerial contribution to higher education sector (universities)

The research provides significant insights and demonstrates good understanding of student perceived service quality in Indian university context. There are a number of higher education sector-related contributions that emerge from this research. The changing nature and need of higher education services and increase in competitive intensity necessitates higher performance levels in the Indian higher education (universities). These can only be achieved through a better understanding of the expectations of students and the importance placed by them on aspects such as teaching, administrative services, academic facilities, campus infrastructure, support services and internationalization. The study identified that student perceived service quality is a key antecedent to student satisfaction, motivation and loyalty, which conveys that service quality is an important construct.

5. Limitations and scope for further research

The research has its own limitations. As the sample was collected from seven universities in the state of Andhra Pradesh, the result cannot be generalized to all the universities in India as a whole. The study developed and tested a new measurement instrument that covers all the service aspects experienced by the student as primary customer in higher education (Hill, 1995). Further studies can also measure service quality in the perspective of other key stakeholders.

Service quality and student satisfaction were studied as antecedents to the student loyalty motivation. There may be additional factors influencing and interacting with the student loyalty and motivation. The future studies can reveal a causal relation with different samples to generalize the theory; also, it is recommended to study other possible antecedents which would influence motivation, loyalty and satisfaction.

References

Abdullah, F. (2006), "The development of HEdPERF: a new measuring instrument of service quality for the higher education sector", *International Journal of Consumer Studies*, Vol. 30 No. 6, pp. 569-581.

Ahmed, I., Nawaz, M.M., Ahmad, Z., Ahmad, Z., Shaukat, M.Z., Usman, A. and Ahmed, N. (2010), "Does service quality affect students performance? Evidence from institutes of higher learning", *African Journal of Business Management*, Vol. 4 No. 12, pp. 2527-2533.

Aldridge, S. and Rowley, J. (1998), "Measuring customer satisfaction in higher education", *Quality Assurance in Education*, Vol. 6 No. 4, pp. 197-204.

Alpert, R. and Haber, R.N. (1960), "Anxiety in academic achievement situations", *Journal of Abnormal and Social Psychology*, Vol. 61 No. 2, pp. 207-215.

Alves, H. and Raposo, M. (2007), "Conceptual model of student satisfaction in higher education", *Total Quality Management & Business Excellence*, Vol. 18 No. 5, pp. 571-588.

Angell, R.J., Heffernan, T.W. and Megicks, P. (2008), "Service quality in postgraduate education", *Quality Assurance in Education*, Vol. 16 No. 3, pp. 236-254.

Bean, J.P. and Metzner, B.S. (1985), "A conceptual model of non-traditional undergraduate student attrition", *Review of Educational Research*, Vol. 55 No. 4, pp. 485-540.

Blass, E. and Weight, P. (2005), "The MBA is dead – part 1: God save the MBA!", *On the Horizon*, Vol. 13 No. 4, pp. 229-240.

Bloemer, J. and Ruyter, K. (1998), "On the relationship between store image, store satisfaction and storeloyalty", *European Journal of Marketing*, Vol. 32 Nos 5/6, pp. 499-513.

Bloemer, J., de Rutyer, K. and Wetzels, M. (1999), "Linking perceived service quality and service loyalty: a multi-dimensional perspective", *European Journal of Marketing*, Vol. 33 Nos 11/12, pp. 1082-1106.

Bolton, R.N., Lemon, K.N. and Verhoef, P.C. (2004), "The theoretical underpinnings of customer asset management: a framework and propositions for future research", *Journal of the Academy of Marketing Science*, Vol. 32 No. 3, pp. 271-292.

Boulding, W., Kalra, A., Staelin, R. and Zeithaml, V.A. (1993), "A dynamic process model of service quality: from expectations to behavioral intensions", *Journal of Marketing Research*, Vol. 30 No. 1, pp. 7-28.

Brady, M.K. and Cronin, J.J. Jr (2001), "Some new thoughts on conceptualizing perceived service quality: a hierarchical approach", *Journal of Marketing*, Vol. 65 No. 3, pp. 34-49.

Brown, W.F. and Holtzman, W.H. (1966), *Manual of the Survey of Study Habits and Attitudes*, Psychology Corporation, New York, NY.

Byrne, B.M. (2010), *Structural Equation Modeling with AMOS: Basic Concepts, Applications, and Programming*, 2nd ed., Psychology Press, New York, NY.

Carrillat, F.A., Jaramillo, F. and Mulki, J.P. (2007), "The validity of the SERVQUAL and SERVPERF scales: a meta-analytic view of 17 years of research across five continents", *International Journal of Service Industry Management*, Vol. 18 No. 5, pp. 472-490.

Caruana, A. (2002), "Service loyalty: the effects of service quality and the mediating role of customer satisfaction", *European Journal of Marketing*, Vol. 36 No. 7, pp. 811-828.

Chang, S.J., Van Witteloostuijn, A. and Eden, L. (2010), "From the editors: common method variance in international business research", *Journal of International Business Studies*, Vol. 41 No. 2, pp. 178-184.

Chaudhuri, A. and Holbrook, M.B. (2001), "The chain of effects from brand trust and brand affect to brand performance: the role of brand loyalty", *Journal of Marketing*, Vol. 65 No. 2, pp. 81-93.

Chen, Y.F., Hsiao, C.H. and Lee, W.C. (2007), "How does student satisfaction influence student loyalty–from the relationship marketing perspective", (accessed 30 January 2012).

Chua, C. (2004), "Perception of quality in higher education", *Proceedings of the Australian Universities Quality Forum, Toronto*.

Churchill, G.A. Jr (1979), "A paradigm for developing better measures of marketing constructs", *Journal of Marketing Research*, Vol. 1 No. 1, pp. 64-73.

Clemes, M.D., Cohen, D.A. and Wang, Y. (2013), "Understanding Chinese university students' experiences: an empirical analysis", *Asia Pacific Journal of Marketing and Logistics*, Vol. 25 No. 3, pp. 391-427.

Clemes, M.D., Gan, C.E.C. and Kao, T. (2008), "University student satisfaction: an empirical analysis", *Journal of Marketing for Higher Education*, Vol. 17 No. 2, pp. 292-325.

Clewes, D. (2003), "A student-centered conceptual model of service quality in higher education", *Quality in Higher Education*, Vol. 9 No. 1, pp. 69-85.

Coltman, T., Devinney, T.M., Midgley, D.F. and Venaik, S. (2008), "Formative versus reflective measurement models: two applications of formative measurement", *Journal of Business Research*, Vol. 61 No. 12, pp. 1250-1262.

Cornuel, E. (2005), "The role of business schools in society", *Journal of Management Development*, Vol. 24 No. 9, pp. 819-829.

Covington, M.V. (2000), "Goal theory, motivation and school achievement: an integrative review", *Annual Review of Psychology*, Vol. 51 No. 1, pp. 171-200.

Cronbach, L.J. (1951), "Coefficient alpha and internal structure test", *Psychometrika*, Vol. 16 No. 3, pp. 297-300.

Cronin, J.J. Jr and Taylor, S.A. (1992), "Measuring service quality: a reexamination and extension", *Journal of Marketing*, Vol. 56 No. 3, pp. 55-68.

Cuthbert, P.F. (1996), "Managing service quality in HE: is SERVQUAL the answer? Part 1", *Managing Service Quality*, Vol. 6 No. 2, pp. 11-16.

Dabholkar, P.A., Shepherd, C.D. and Thrope, D.I. (2000), "A comprehensive framework for service quality: an investigation of critical conceptual and measurement issues through a longitudinal study", *Journal of Retailing*, Vol. 76 No. 2, pp. 131-139.

Dabholkar, P.A., Thorpe, D.I. and Rentz, J.O. (1996), "A measure of service quality for retail stores: scale development and validation", *Journal of the Academy of Marketing Science*, Vol. 24 No. 1, pp. 3-16.

de Jager, J. and Gbadamosi, G. (2010), "Specific remedy for specific problem: measuring service quality in South African higher education", *Higher Education*, Vol. 60 No. 3, pp. 251-267.

Deming, W.E. and Edwards, D.W. (1982), *Quality, Productivity, and Competitive Position*, Massachusetts Institute of Technology, Center for Advanced Engineering Study, Cambridge, MA, Vol. 183.

Dick, A.S. and Basu, K. (1994), "Customer loyalty: toward an integrated conceptual framework", *Journal of the Academy of Marketing Science*, Vol. 22 No. 2, pp. 99-113.

Douglas, J., Douglas, A. and Barnes, B. (2006), "Measuring student satisfaction at a UK university", *Quality Assurance in Education*, Vol. 14 No. 3, pp. 251-267.

Eccles, J.C. and Wigfield, A. (2002), "Motivational beliefs, values, and goals", *Annual Review Psychology*, Vol. 53 No. 1, pp. 109-132.

Elliott, K.M. and Shin, D. (2002), "Student satisfaction: an alternative approach to assessing this important concept", *Journal of Higher Education Policy and Management*, Vol. 24 No. 2, pp. 197-209.

Entwistle, N.J. and Entwistle, D. (1970), "The relationships between personality, study methods and academic performance", *British Journal of Educational Psychology*, Vol. 40 No. 2, pp. 132-143.

Field, A. (2005), *Discovering Statistics using SPSS*, 2nd ed, Sage Publications, London.

Frankola, K. (2001), "Why online learners drop out", *Workforce-Costa Mesa*, Vol. 80 No. 10, pp. 52-61.

Gamage, D.T., Suwanabroma, J., Ueyama, T., Hada, S. and Sekikawa, E. (2008), "The impact of quality assurance measures on student services at the Japanese and Thai private universities", *Quality Assurance in Education*, Vol. 16 No. 2, pp. 181-198.

Gronholdt, L., Martensen, A. and Kristensen, K. (2000), "The relationship between customer satisfaction and loyalty: cross-industry differences", *Total Quality Management*, Vol. 11 Nos 4/6, pp. 509-514.

Grönroos, C. (1984), "A service quality model and its marketing implications", *European Journal of Marketing*, Vol. 18 No. 4, pp. 36-44.

Gronroos, C. (1990), "Relationship approach to marketing in service contexts: the marketing and organizational behavior interface", *Journal of Business Research*, Vol. 20 No. 1, pp. 3-11.

Gruber, T., Fuß, S., Voss, R. and Gläser-Zikuda, M. (2010), "Examining student satisfaction with higher education services: Using a new measurement tool", *International Journal of Public Sector Management*, Vol. 23 No. 2, pp. 105-123.

Guolla, M. (1999), "Assessing the teaching quality to student satisfaction relationship: applied customer satisfaction research in the classroom", *Journal of Marketing Theory and Practice*, Vol. 7 No. 3, pp. 87-97.

Gupta, D. and Gupta, N. (2012), "Higher education in India: structure, statistics and challenges", *Journal of Education and Practice*, Vol. l3 No. 2, pp. 17-24.

Hair, J.F. Jr, Black, W.C., Babin, B.J., Anderson, R.E. and Tatham, R.L. (2008), *Multivariate Data Analysis*, 6th ed, Pearson Prentice Hall, New Delhi.

Harvey, L. and Green, D. (1993), "Defining quality", *Assessment and Evaluation in Higher Education*, Vol. 18 No. 1, pp. 9-34.

Helgesen, Ø. and Nesset, E. (2007), "What accounts for students' loyalty? Some field study evidence", *International Journal of Educational Management*, Vol. 21 No. 2, pp. 126-143.

Hennig-Thurau, T., Langer, M.F. and Hansen, U. (2001), "Modeling and managing student loyalty an approach based on the concept of relationship quality", *Journal of Service Research*, Vol. 3 No. 4, pp. 331-344.

Hill, F. (1995), "Managing service quality in higher education: the role of the student as primary consumer", *Quality Assurance in Education*, Vol. 3 No. 3, pp. 10-21.

Hu, L. and Bentler, P.M. (1999), "Cutoff criteria for fit indexes in covariance structure analysis: conventional criteria versus new alternatives", *Structural Equation Modeling: A Multidisciplinary Journal*, Vol. 6 No. 1, pp. 1-55.

Hufton, N.R., Elliott, J.G. and Illushin, L. (2003), "Teachers' beliefs about student motivation: similarities and differences across cultures", *Comparative Education*, Vol. 39 No. 3, pp. 367-389.

Huili, Y. and Jing, Y. (2012), "Empirical research and model building about customer satisfaction index on postgraduate education service quality", *Canadian Social Science*, Vol. 8 No. 1, pp. 108-111.

Iacobucci, D., Ostrom, A. and Grayson, K. (1995), "Distinguishing service quality and customer satisfaction: the voice of the customer", *Journal of Consumer Psychology*, Vol. 4 No. 3, pp. 277-303.

Jarvis, C.B., MacKenzie, S.B. and Podsakoff, P.M. (2003), "A critical review of construct indicators and measurement model misspecification in marketing and consumer research", *Journal of Consumer Research*, Vol. 30 No. 2, pp. 199-218.

Jiewanto, A., Laurens, C. and Nelloh, L. (2012), "Influence of service quality, university image, and student satisfaction toward WOM intention: a Case Study on Universitas Pelita Harapan Surabaya", *Procedia - Social and Behavioral Sciences*, Vol. 40 No. 1, pp. 16-23.

Juran, J.M. (1974), *Quality Control Handbook*, 3rd ed, McGraw-Hill, New York, NY.

Katiliūtė, E. and Kazlauskienė, I. (2010), "The model of studies quality dimensions from student's perception", *Economics and Management*, Vol. 15 No. 1, pp. 580-586.

Kline, R.B. (2005), *Principles and Practice of Structural Equation Modeling*, 2nd ed, Guilford, New York, NY.

Kotler, P. (2000), *Marketing Management*, 11th Edition, Prentice Hall, New Jersey.

Lagrosen, S., Seyyed-Hashemi, R. and Leitner, M. (2004), "Examination of the dimensions of quality in higher education", *Quality Assurance in Education*, Vol. 12 No. 2, pp. 61-69.

LaRose, R. and Whitten, P. (2000), "Re-thinking instructional immediacy for web courses: a social cognitive exploration", *Communication Education*, Vol. 49 No. 4, pp. 320-338.

Mahapatra, S.S. and Khan, M.S. (2007), "A framework for analyzing quality in education settings", *European Journal of Engineering Education*, Vol. 32 No. 2, pp. 205-217.

Marzo-Navarro, M., Pedraja-Iglesias, M. and Rivera-Torres, M.P. (2005), "A new management element for universities: satisfaction with the courses offered", *International Journal of Educational Management*, Vol. 19 No. 6, pp. 505-526.

Mason, M.M. (2012), "Motivation, satisfaction, and innate psychological needs", *International Journal of Doctoral Studies*, Vol. 7 No. 1, pp. 259-277.

Meyer, D.K. and Turner, J.C. (2006), "Re-conceptualizing emotion and motivation to learn in classroom contexts", *Educational Psychology Review*, Vol. 18 No. 4, pp. 377-390.

Mosahab, R., Mahamad, O. and Ramayah, T. (2010), "Service quality, customer satisfaction and loyalty: a test of mediation", *International Business Research*, Vol. 3 No. 4, pp. 72-80.

Nguyen, T.D. (2009), "Signal quality and service quality: a study of local and international MBA programs in Vietnam", *Quality Assurance in Education*, Vol. 17 No. 4, pp. 364-376.

Nunnally, J.C. (1978), *Psychometric Theory*, McGraw-Hill Book Company, New York, NY.

Oldfield, B.M. and Baron, S. (2000), "Student perceptions of service quality in a UK university business and management faculty", *Quality Assurance in education*, Vol. 8 No. 2, pp. 85-95.

Oliva, T.A., Oliva, R.L. and Macmillan, I.C. (1992), "A catastrophe model for developing services satisfaction strategies", *Journal of Marketing*, Vol. 56 No. 3, pp. 83-95.

Oliveira, O.J.D. and Ferreira, E.C. (2009), "Adaptation and application of the SERVQUAL scale in higher education", *POMS 20th Annual Conference, Orlando, FL*.

Oliver, R.L. and DeSarbo, W.S. (1989), "Processing of the satisfaction response in consumption: a suggested framework and research proposition", *Journal of Consumer Satisfaction, Dissatisfaction and Complaining Behavior*, Vol. 2 No. 1, pp. 1-16.

Olsen, S.O. (2002), "Comparative evaluation and the relationship between quality, satisfaction, and repurchase loyalty", *Journal of the Academy of Marketing Science*, Vol. 30 No. 3, pp. 240-249.

O'Neill, M.A. and Palmer, A. (2004), "Importance-performance analysis: a useful tool for directing continuous quality improvement in higher education", *Quality Assurance in Education*, Vol. 12 No. 1, pp. 39-52.

Parasuraman, A., Zeithaml, V.A. and Berry, L.L. (1985), "A conceptual model of service quality and its implications for future research", *The Journal of Marketing*, Vol. 49 No. 1, pp. 41-50.

Parasuraman, A., Zeithaml, V.A. and Berry, L.L. (1988), "SERVQUAL: a multiple-item scale for measuring consumer perceptions of service quality", *Journal of Retailing*, Vol. 64 No. 1, pp. 12-40.

Parasuraman, A., Zeithaml, V.A. and Malhotra, A. (2005), "ES-QUAL a multiple-item scale for assessing electronic service quality", *Journal of service research*, Vol. 7 No. 3, pp. 213-233.

Pariseau, S.E. and McDaniel, J.R. (1997), "Assessing service quality inschools of business", *International Journal of Quality & Reliability Management*, Vol. 14 No. 3, pp. 204-218.

Parri, J. (2006), "Quality in higher education", *Vadyba/Management*, Vol. 2 No. 11, pp. 107-111.

Pascarella, E.T. (1980), "Student-faculty informal contact and college outcomes", *Review of Educational Research*, Vol. 50 No. 4, pp. 545-595.

Peng, P.J. and Samah, A.J.A. (2006), "Measuring students' satisfaction for quality education in a e-learning university", *Unitar e-Journal*, Vol. 2 No. 1, pp. 11-21.

Petruzzellis, L., D'Uggento, A.M. and Romanazzi, S. (2006), "Student satisfaction and quality of service in Italian universities", *Managing Service Quality*, Vol. 16 No. 4, pp. 349-364.

Podsakoff, P.M., MacKenzie, S.B., Lee, J.Y. and Podsakoff, N.P. (2003), "Common method biases in behavioral research: a critical review of the literature and recommended remedies", *Journal of Applied Psychology*, Vol. 88 No. 5, pp. 879-903.

Quinn, A., Lemay, G., Larsen, P. and Johnson, D.M. (2009), "Service quality in higher education", *Total Quality Management*, Vol. 20 No. 2, pp. 139-152.

Richardson, J.T.E. (2005), "Instruments for obtaining student feedback: a review of the literature", *Assessment and Evaluation in Higher Education*, Vol. 30 No. 4, pp. 387-415.

Rojas-Méndez, J.I., Vasquez-Parraga, A.Z., Kara, A.L.I. and Cerda-Urrutia, A. (2009), "Determinants of student loyalty in higher education: a tested relationship approach in Latin America", *Latin American Business Review*, Vol. 10 No. 1, pp. 21-39.

Rowley, J. (1996), "Measuring quality in higher education", *Quality in Higher Education*, Vol. 2 No. 3, pp. 237-255.

Senthilkumar, N. and Arulraj, A. (2011), "SQM-HEI – determination of service quality measurement of higher education in India", *Journal of Modeling in Management*, Vol. 6 No. 1, pp. 60-78.

Seth, N., Deshmukh, S.G. and Vrat, P. (2005), "Service quality models: a review", *International Journal of Quality & Reliability Management*, Vol. 22 No. 9, pp. 913-949.

Shahin, A. (2006), "SERVQUAL and model of service quality gaps: a framework for determining and prioritizing critical factors in delivering quality services", *Service Quality – An Introduction*, Vol. 2 No. 3, pp. 117-131.

Straub, D., Boudreau, M.C. and Gefen, D. (2004), "Validation guidelines for is positivist research", *Communications of the ACM*, Vol. 13 No. 24, pp. 1-79.

Stukalina, Y. (2010), "Using quality management procedures in education: managing the learner-centered educational environment", *Technological and Economic Development of Economy Baltic Journal on Sustainability*, Vol. 16 No. 1, pp. 75-93.

Subrahmanyam, A., Raja Shekhar, B. and Mishra, R.K. (2013), "Critical review on issues and challenges to measure service quality in higher education", *International Journal of Current Research*, Vol. 5 No. 1, pp. 038-041.

Sultan, P. and Wong, H.Y. (2012), "Antecedents and consequences of service quality in a higher education context a qualitative research approach", *Quality Assurance in Education*, Vol. 21 No. 1, pp. 70-95.

Sumaedi, S., Bakti, I.G.M.Y. and Metasari, N. (2011), "The effect of students' perceived service quality and perceived price on student satisfaction", *Management Science and Engineering*, Vol. 5 No. 1, pp. 88-97.

Tabachnick, B.G. and Fidell, L.S. (2001), *Using Multivariate Statistics*, 4th ed, Harper Collins College, New York, NY.

Tinto, V. (1987), *Leaving College: Rethinking the Causes and Cures of Student Attrition*, University of Chicago Press, Chicago, IL.

Tsinidou, M., Gerogiannis, V. and Fitsilis, P. (2010), "Evaluation of the factors that determine quality in higher education: an empirical study", *Quality Assurance in Education*, Vol. 18 No. 3, pp. 227-244.

Tsuji, Y., Bennett, G. and Zhang, J. (2007), "Consumer satisfaction with an action sports event", *Journal Sport Marketing Quarterly*, Vol. 16 No. 4, pp. 199-208.

Wolfgang, M.E. and Dowling, W.D. (1981), "Differences in motivation of adult and younger undergraduates", *The Journal of Higher Education*, Vol. 52 No. 6, pp. 640-648.

Wolters, C.A. and Pintrich, P.R. (1998), "Contextual differences in student motivation and self-regulated learning in mathematics, English, and social studies classrooms", *Instructional Science*, Vol. 26 No. 1, pp. 27-47.

Yavas, U., Benkenstein, M. and Stuhldreier, U. (2004), "Relationships between service quality and behavioural outcomes", *The International Journal of Bank Marketing*, Vol. 22 No. 2, pp. 144-157.

Yildiz, S.M. and Kara, A. (2009), "The PESPERF scale: an instrument for measuring service quality in the school of physical education and sports sciences (PESS)", *Quality Assurance in Education*, Vol. 17 No. 4, pp. 393-415.

Yunus, N.K.Y., Ishak, S. and Razak, A.Z.A.A. (2010), "Motivation, empowerment, service quality and polytechnic students' level of satisfaction in Malaysia", *International Journal of Business and Social Science*, Vol. 1 No. 1, pp. 120-128.

Zeithaml, V.A., Berry, L.L. and Parasuraman, A. (1996), "The behavioral consequences of service quality", *the Journal of Marketing*, Vol. 60 No. 2, pp. 31-46.

Zeithaml, V.A., Bitner, M.J. and Gremler, D.D. (2008), *Services Marketing: Integrating Customer Focus across the Firm*, 5th Ed, McGraw-Hill, Boston, MA.

Further reading

Anderson, E.W. and Sullivan, M.W. (1993), "The antecedents and consequences of customer satisfaction for firms", *Marketing science*, Vol. 12 No. 2, pp. 125-143.

Annamdevula, S., Bellamkonda, R.S. and Mishra, R.K. (2013), "Critical review on issues and challenges to measure service quality in higher education", *International Journal of Current Research*, Vol. 5 No. 1, pp. 038-041.

Baird, J.R., Fensham, P.J., Gunstone, R.F. and White, R.T. (1991), "The importance of reflection in improving science teaching and learning", *Journal of research in Science Teaching*, Vol. 28 No. 2, pp. 163-182.

Beerli, A., Martin, J.D. and Quintana, A. (2004), "A model of customer loyalty in the retail banking market", *European Journal of Marketing*, Vol. 38 Nos 1/2, pp. 253-275.

Borsboom, D., Mellenbergh, G.J. and Van Heerden, J. (2004), "The concept of validity", *Psychological Review*, Vol. 111 No. 4, pp. 1061-1071.

Netemeyer, R.G., Bearden, W.O. and Sharma, S. (Eds.). (2003), *Scaling Procedures: Issues and Applications*, Sage Press, New York, NY.

Nguyen, N. and LeBlanc, G. (2001), "Image and reputation of higher education institutions in students' retention decisions", *The International Journal of Educational Management*, Vol. 15 No. 6, pp. 303-311.

Nunnally, J.C. (1970), *Introduction to Psychological Measurement*, McGraw-Hill Book Company, New York, NY.

Patterson, P.G. and Spreng, R.A. (1997), "Modeling the relationship between perceived value, satisfaction and repurchase intentions in a business-to-business, services context: an empirical examination", *The International Journal of Service Industry Management*, Vol. 8 No. 5, pp. 415-432.

Philip, G. and Hazlett, S.A. (1997), "The measurement of service quality: a new P-C-P attributes model", *International Journal of Quality & Reliability Management*, Vol. 14 No. 3, pp. 260-286.

Roest, H. and Pieters, R. (1997), "The nomological net of perceived service quality", *The International Journal of Service Industry Management*, Vol. 8 No. 4, pp. 336-351.

Rossiter, J.R. (2002), "The C-OAR-SE procedure for scale development in marketing", *International Journal of Research in Marketing*, Vol. 19 No. 4, pp. 305-335.

Ruyter, K. (1997), "Measuring service quality and service satisfaction: an empirical test of an integrative model", *Journal of Economic Psychology*, Vol. 18 No. 4, pp. 387-406.

Spector, P.E. (Ed.) (1992), *Summated Rating Scale Construction: An Introduction (No. 82)*, Sage, New York, NY.

Taylor, S.A. and Baker, T.L. (1994), "An assessment of the relationship between service quality and customer satisfaction in the formation of consumers' purchase intentions", *Journal of Retailing*, Vol. 70 No. 2, pp. 163-178.

Teas, R.K. (1993), "Performance evaluation, and consumers' perceptions of quality", *Journal of Marketing*, Vol. 57 No. 4, pp. 18-34.

Appendix 1

Code	Indicators	Source
Factor 1: Teaching (TC)		
TC1	Teachers' responsive and accessible	Lagrosen *et al.* (2004) Sweden
TC2	Course content develops students' knowledge	Abdullah, (2006) Malaysia; Katiliūtė; and Kazlauskienė; (2010) Lithuania
TC3	Teachers follow good teaching practices	SELF
TC4	Teachers follow curriculum strictly	SELF
TC5	Continuously evaluate the student's performance	SELF
TC6	Department has sufficient academic staff	SELF
TC7	Teachers treat all students in equal manner #	Yildiz, and Kara (2009) Turkey
TC8	Collects feedback to provide better services	Abdullah, (2006) Malaysia
Factor 2: Administrative services (AS)		
AS1	Admin staff provides error-free work	SELF
AS2	Admin staff provides service without delay	SELF
AS3	Admin staff are courteous and willing to help	Mahapatra and Khan (2007) India
AS4	Admin maintains accurate and retrieval records	Abdullah, (2006) Malaysia
AS5	Admin staff accessible during office hours	SELF
AS6	Students informed promptly of changes #	SELF
Factor 3: Academic facilities (AF)		
AF1	Classrooms equipped with teaching aids	SELF
AF2	Computer/science labs are well equipped	de Jager and Gbadamosi (2010), Africa
AF3	Library has adequate academic resources	SELF
AF4	Library is electronically equipped (E-library)#	SELF
AF5	Campus environment is convenient to study well#	SELF
AF6	University has adequate auditoriums etc.#	SELF
AF7	Maintenance of facilities#	SELF
Factor 4: Campus infrastructure (CI)		
CI1	University has sports and recreation facilities	Angell *et al.* (2008) UK
CI2	University has adequate hostel facilities	SELF
CI3	University has safety and security measures	SELF
CI4	University hostels provide quality food#	SELF
Factor 5: Support services (SS)		
SS1	University has adequate amenities	SELF
SS2	University organizes cultural and extracurricular	SELF
SS3	University provides counseling services	Abdullah (2006) Malaysia
SS4	University provides good medical services#	Tsinidou *et al.* (2010) Greece

(*continued*)

Table AI. Indicators of HiEduQual scale and their source

	Indicators	Source
Factor 6: Internationalization (IN)		
IN1	University promotes international activities	SELF
IN2	University has teachers from abroad	Gamage *et al.* (2008) Thailand & Japan
Student satisfaction		
SSt1	Satisfaction with the quality of academic services	SELF
SSt2	Satisfaction with the quality of administrative services	SELF
SSt 3	Satisfaction with the quality of support services	SELF
SSt 4	Satisfaction with the quality of equipment and facilities	SELF
SSt 5	Satisfaction with the overall maintenance of the university	SELF
SSt6	Satisfaction with the overall quality of services being provided by the university#	SELF
Student loyalty		
SL1	Preference to pursue higher studies in the same university	Helgesen and Nesset (2007), Norway
SL2	Recommending the university to friends and family members	Rojas-MéNdez *et al.* (2009), Canada
SL3	Feeling proud to be associated with the university	SELF
SL4	Taking care of the university	SELF
Student motivation		
SM1	Teaching practices followed by teachers are motivating me to study well	SELF
SM2	Academic services (class rooms, library, labs, etc.) provided by the university motivate me to carry out my studies better	SELF
SM3	Support and administrative services provided by the university help me to carry out my studies smoothly	SELF
SM4	Physical facilities of the university persuade me to study well	SELF
SM5	University environment motivates to study well#	SELF

Notes: The items below are grouped by dimension for expositional convenience; they appeared in random order on the survey; the symbols preceding the items correspond to the variable names in Table II in the body of the article. # represents an item deleted after CFA

Table AI.

About the authors

Subrahmanyam Annamdevula is a Faculty at the Central University of Karnataka School of Business Studies. He received his PhD in Services and Operation Management from University of Hyderabad. He has done MBA from Pondicherry Central University, India and MSc (Psychology) from Sri Venkateswara University, India. His primary research interests are related to service quality in higher education and related to services marketing. Annamdevula Subrahmanyam is the corresponding author and can be contacted at: dr.asmin@yahoo.com

Raja Shekhar Bellamkonda is a Professor at the School of Management Studies, University of Hyderabad. He received his PhD from Kakatiya University, India. He has published around 50 papers in national and international journals and conferences. He has authored three books. His primary research interests are related to service quality management, operations research and production and operations management.