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# Evaluation of Service Quality in Higher Education – A Study of Select Universities with Reference to South India

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**Abstract**
Indian higher education system is the third largest in the world, next to United States and China. The higher education sector in India has witnessed a remarkable increase in its institutional ability since independence. Though there is a global recognition to the Indian higher education system, still considerable issues and challenges yet to be addressed, they are quality, excellence, physical infrastructure, adequate number of qualified teachers, effectiveness of the teaching-learning processes, sustained efforts for promoting research and efficient academic governance in Universities and colleges, world class standards. Gross Enrollment Ratio and service quality remain the major areas of concern. To meet these issues and challenges the higher education in India requires major reforms are required. The management of quality needs a different approach when it comes to the service sector. The studies on service quality on various sectors have been increasing from past four decades. Among all the service sectors, higher education needs a special emphasis on evaluating the issues related to quality of services and its measurement.
Quality in higher education is a complex and multifaceted concept. Few studies have been done in Service quality in Higher Education in Indian Context especially focusing on the Southern part of India. In this scenario this study in service quality in higher education sector in South India (commonly known as the center for global education) has been proposed. A Scale has been developed to measure service quality in Higher Education using confirmatory Factor Analysis.

**Key words:** Service quality, confirmatory Factor Analysis, higher education

## Introduction

The socio-economic development of any country solely depends on the quality of education it has. The utmost preference of any county is development of its human resources, keeping intact with the societal values and changes in various aspects like scientific development of the country. The quality and level of higher education plays a crucial role in creating skills, knowledge, abilities, and awareness among students. It acts as an antidote to poverty, hunger, malnutrition and corruption. The higher education sector acts as a powerful tool to build a knowledge-based society and also has a direct bearing on it.

## Issues and Challenges in Higher Education in India:

Though there is a global recognition to the Indian higher education system, still considerable issues and challenges yet to be addressed, they are quality, excellence, physical infrastructure, adequate number of qualified teachers, effectiveness of the teaching-learning processes, sustained efforts for promoting research and efficient academic governance in Universities and colleges, world class standards. Gross Enrollment Ratio and service quality remain the major areas of concern. In spite of all these challenges the 21st century model of higher education aims at providing a high quality, yet equitable and affordable and focuses to make India a role-model for a higher education system that is not just the best in the world but the best for the world.

## Literature Review:

### Service Quality in Higher Education:

The management of quality needs a different approach when it comes to the service sector. The studies on service quality on various sectors have been increasing from past four decades. Among all the service sectors, higher education needs a special emphasis on evaluating

the issues related to quality of services and its measurement. Quality in higher education is a complex and multifaceted concept where a single correct definition of quality is lacking (Harvey & Green, 1993). As a consequence, consensus concerning the best way to define and measure service quality does not exist yet (Clewes, 2003). As researchers recognized the importance of measuring service quality in higher education, they still stressed to define in common words. Service quality in the educational sector is considered by various researchers because of its importance and outcomes.

**Service Quality Measurement Models in Higher Education**

The measurement of student satisfaction in higher education is not a new concept Berdie (1944) investigated relationships within engineering students curricular satisfaction. A number of well-developed instruments are available for the study of such variables as the college environment **(**Pace, 1963; Astin, 1963), student needs (Stern, 1963), and student-environment congruence (Pervin, 1967) . Koushiki Choudhury (2015) Evaluated the customer perceived service quality in business management education in India by using a modified SERVQUAL scale with a sample of 1,152 customers from six institutions and analyzed the results using SPSS.

Annamdevula Subrahmanyam & Bellamkonda Raja Shekhar (2012) developed a scale to know the factors affecting student perceived service quality and student satisfaction called as HiEduQual in the Indian context. And validated the instrument using Confirmatory Factor Analysis (CFA) and identified the six critical factors namely Teaching, Administrative services, Academic facilities, Campus Infrastructure, Support services and Internationalization with 23 items. Jain.R, Sahney & Gautam Sinha (2013) developed an instrument for measuring students perceptions regarding service quality in the Indian context with 38 items. They conducted the study with a sample of 246 student's and identified seven dimensions those are curriculum, input quality, interaction quality, support facilities, industry interaction, academic facilities and non academic processes.N. Senthilkumar and A. Arulraj (2011) developed a new model called SQM-HEI for measuring service quality in Indian higher educational institutions. The survey was conducted across Tamil Nadu with a structured questionnaire of 41 items and on seven point Likert scale. The results show that the quality education is based on best faculty, excellent physical resources and placement. Sultan.P & HO Yin Wong (2010) developed PHEd-model (Performance-based Higher Education) for measuring service quality in the higher education sector. the instrument with 67 items loaded with eight factors are of assurance, capability, effectiveness, efficiency, dependability, semester and syllabus competencies, unusual situation management and scale reliability is confirmed using the Cronbach's alpha. The principle component analysis followed by a Varimax method is used to extract the factor loadings. This study finds that academics are the core of the value-based higher education sector.. The results also stated that advertisements and word-of-mouth motivate students to seek admission particularly for international students.

Sangeeta Angom (2015) conducted a study on private higher education in India in two private Universities and concluded that Indian private higher education is getting more competitive with increase in the number of institutions. The administrative style is similar to that of public Universities but lack of administrative staff like controller of examination, deputy registrar etc.

Khanchitpol Yousapronpaiboon (2014) examines the SERVQUAL scale validity and reliability in Thailand higher education by collecting 350 samples from a private University. They found that higher education in Thailand did not meet the student's expectation and observed the gap in perceptions and expectations of all the five dimensions, as follows Reliability, Tangible, Responsiveness, Empathy, Assurance. Yeo, R. K., & Li, J. (2014) explored the competitive forces of higher education beyond SERVQUAL . Rajani Jain, Sangeeta Sahney & Gautam Sinha (2013) measured service quality in higher education in the Indian context. It was observed that service quality in higher education setting comprises seven

dimensions viz., input quality, curriculum, academic facilities, industry interaction, interaction quality, support facilities and non academic processes..Chahal and Devi, (2013) stated that service failure in education sector refers the extent of gap in the service delivery. In education sector, the types of service failure occurs in teaching, examination, library, laboratories, administration, infrastructure and miscellaneous such as canteen or hostel facility. Parves Sultan and Ho Yin Wong (2013) conducted a study at Australian University with 19 students by focused group discussions to identify the antecedents to perceived service quality in a higher education context. They found that academic, administration and facilities are the three aspects of service quality. Student satisfaction and student trust are found to have direct positive relationship with perceived service quality as consequence and brand performance and behavioral intention are found to have indirect relationships. Calvo-Porral, C., Lévy-Mangin, J. P., & Novo-Corti, I. (2013) conducted a study on perceived quality in higher education: an empirical study by using a modified SERVQUAL instrument in private and public Universities. They found that the private Universities got a better assessment than the public. The service quality dimensions tangibility and empathy are the most important determinants of perceived quality in higher education having direct positive impact on perceived quality. Among these two dimensions, tangibility has the greatest contribution to the development of perceived quality. Ardi, R., Hidayatno, A., & Madeline Melchor Cardona & Y Juan Jose Bravo (2012) measured the service quality in higher education institutions in Colombian University by testing the quality frame work 5Q's model proposed by Zineldin (2007) and concluded that Zineldin's framework was similar to their research findings.Annamdevula, S., & Bellamkonda, R. S. (2012) measured service quality in Indian higher education sector. The study identified five determinants to evaluate the service quality in the higher education sector those are administrative services, academic facilities, teaching & course content, campus infrastructure and support services. Senthilkumar, N.,&Arulraj, A. (2011) measured service quality of higher education in India, and found that the quality of education is based on the best faculty (TM), the excellent physical resources (ECSF), a wide range of disciplines (DA) which paved the diverse student body and to improve the employability of the graduates coming out of the higher educational institutions in India. Ahmed, I., Nawaz, M. M., Ahmad, Z., Ahmad, Z., Shaukat, M. Z., Usman, A., & Ahmed, N. (2010) examined the relationship between service quality, satisfaction and motivation in higher education institutions using SERVQUAL model. The findings show that service quality has a significant effect on satisfaction and motivation of students. Further studies also proved that student satisfaction and motivation are important for better performance. Chatterjee, A., Ghosh, C. & Bandyopadhyay, S. (2009) conducted a study to prove that the student's feedback reports are valid measures for measuring teaching effectiveness and improvement of teaching quality. It has been argued successfully that ratings can be used as an aid for teaching improvement. Stodnick, M., & Rogers, P. (2008) measured the quality of classroom experience by using SERVQUAL at Southwestern University in USA and find tangibility, reliability, assurance, empathy, and responsiveness are the important dimensions for the students.

Douglas, J., McClelland, R., & Davies, J. (2008) developed a conceptual model of student satisfaction with their experience in higher education. The study identified critical satisfiers and dissatisfies with teaching, assessment, learning and ancillary provision. The students are dissatisfied with attitude, tangibles, team work, responsiveness, communication, and access.

Abdullah, F. (2006) Compared the three measuring instruments of service quality HEdPERF, SERVPERF and HEdPERF-SERVPERF in the Malaysian Universities of which instrument had the superior measuring capability in terms of uni-dimensionality, reliability, validity and explained variance. They find that the modified five–factor structure of HEdPERF scale with 38 items is advantage of being more specific in areas that are important in evaluating service quality within higher

education sector. Better in explain the variance of service quality level and giving quantitative results it is of superior instrument in measuring service quality within higher education. Abdullah F. (2006a) compared three instruments of service quality HEdPERF (Higher Education Performance) SERVPERF and HEdPERF-SERVPERF in Malaysian territory institutions with a sample of 381 students and concluded that a modified five-factor structure of HEdPERF is most appropriate scale for the higher education sector. Abdullah, F. (2006b) reported that the six dimensions namely, academic aspects, non-academic aspects, reputation, access, program issues and understanding are distinct and important issues in the higher education context. Douglas, J., Douglas, A., & Barnes, B. (2006) suggested that the student experience and its improvement should be at the forefront of any monitoring of higher education quality. Tan, K. C., & Kek, S. W. (2004) conducted a study for measuring the service quality and student satisfaction in two engineering colleges with SERVQUAL instrument. The survey was conducted through online questionnaire comprises of 76 attributes categorized into eight factors with a sample of 958 students. For validating the instrument the principle component method and VARIMAX rotation were used. Sahney, S., Banwet, D. K., &Karunes, S. (2004) conducted a study in engineering and management institutions with a sample of 219 students to identify the customer requirement and constructs of service quality improvement from student perspective. They Identified Competence, Attitude, Content, Delivery and Reliability are the customer requirements of service quality. The Management system, Technical system and Social system are the constructs for improving service quality as perceived by the customers. Joseph, M., Stone, G., & Joseph, B. (2003) conducted a study to identify the determinants of service quality in education from the perspective of foreign students using a set of measurement scales based upon the importance. Major factors of the instrument were obtained during the focus group discussions and the measurement instrument used in the study was divided into four sections to obtain data about University, quality service experience, perception of their own University and demographical information. Finally the factors were plotted in the importance-performance grid to identify their positions. Overall results of this study proved that universities are doing a satisfactory job from the foreign student perspective. Kwan, P. Y., & Ng, P. W. (1999)conducted a study "quality indicators in higher education – comparing Hong Kong and China's students" they measured the gap score by using the SERVQUAL instrument proposed by Parasuraman and the questionnaire with 51 statements consisting of seven factors they are course content, concern for students, facilities, assessment, medium of instruction, social activates and people. The survey conducted with a sample of 800 students in both the countries and analyzed the gap scores using principal component meted and varimax rotation. The results shows that both Hong Kong and Chinese students are very practical they give importance to study related matters and University education as an investment thus stress course content and facilities. Hong Kong students satisfied with communication and counseling services. Chinese are expecting better communication with University. Hampton, G. M. (1993)and observed the students in the United States shows more interest in campus life, whereas Hong Kong and Chinese give importance to study related matters. They finally concluded that the student's expectations and perceptions are influenced by cultural orientation and environmental factors. Ford, J. B., Joseph, M., & Joseph, B. (1999) developed an instrument to assess service quality perceptions of business students in New Zealand and the USA. The appropriate attributes were identified by focus group discussions which were used to develop the New Zealand questionnaire. Based on the similarity those 20 attributes were grouped into seven factors, i.e., Program issues, Academic reputation, Physical aspects, Career opportunities, Location, Time and others. For the US survey, the same attributes were grouped into six different factors they are program issue, physical aspects, academic reputation, time issues, choice influencers and others. Since there were only insignificant differences between the survey instruments except wording and spelling differences the same New Zealand

attributes were used for US survey. The attributes identified in the New Zealand study were deemed appropriate for use in the USA. Owlia, M. S., & Aspinwall, E. M. (1996) conducted a study that compares various service quality dimensions models in higher education. Authors broadly discussed the quality dimensions in higher education in the view of different groups of customers. From the extensive literature review, the authors have identified six quality dimensions namely Tangibles, Competence, Attitude, Content, Delivery, Reliability and their corresponding characteristics in higher education. Also a framework was developed to disclose the attributes relevant to different groups of customers based on degree of interest and feeling.

Hill, F. M. (1995) discussed aspects of current service quality theory in the context of British higher education, focused on the role of the student as a primary consumer of higher education services.Hampton, G. M. (1993) measured the student's satisfaction by Gap analysis proposed by Parasuraman. The SERVQUAL questionnaire consists of 45 attributes resulting five factors those are quality of education, teaching, social life, campus facilities and effort to pass courses. The survey was conducted on a sample of 473 students and reliability analysis was performed using coefficient alpha. It is identified from the results that the attributes namely quality education, efforts to pass and campus faculties were relatively important for student's evaluation of service quality. Betz, E. L. (1969) developed an instrument called College Student Satisfaction Questionnaire (CSSQ) for measuring student satisfaction. The Questionnaire comprises of 92 items representative of the six satisfaction dimensions those are of policies & procedures, working conditions, compensation, and quality of education, social life and recognition. The survey was conducted in Iowa state University with a sample of 463 students and the internal consistency reliability coefficient were calculated using the average inter item correlation method (Menne, J. W., & Klingensmith, J. E.1969)

**Significance of the study**

With a vision to ensure quality in education the government at the state and central level with various regulatory and accreditation bodies are monitoring the higher educational institutions, yet the quality of higher education is struggling to attain the global level excellence in India. Even in the existing universities the quality does not meet the global standards. Out of the top 400 world University rankings only four institutes are from our country (Times Higher Education World University Ranking 2018). In the area of quality research, India is still lacking in comparison with many countries. The quality of higher education is every body's concern today. Due to the lack of service quality in our education system every year 0.4 million students are going abroad and spending approximately $12bn, this leads to not only loss of foreign exchange but also brain drain, most of them are not coming back. Whereas in the developed countries like USA, Australia, UK and Singapore the higher education is transforming as an industry contributing billions to their GDP

**Objectives of the study**

1. To develop a scale for measuring service Quality in Higher Education

**Data Collection Methods**

The survey research method was used to gather primary data in this study, as the purpose of this research was to understand the attitudes of Students about service quality and satisfaction.

**Survey Instrument**

For measuring service quality the widely used NAAC (National Assessment and Accreditation Council) Parameters and NBA (National Board of Accreditation) Parameters were used to prepare the survey instrument. The questionnaire was modified according to the context after discussions with experts and academicians. .It was finalized after discussions with experts and academicians.

**Respondents and Sample Distribution**

For this study Multi stage sampling procedure was adopted. In India, five major states representing, Southern part of India (namely Tamil Nadu, Andhra Pradesh, Telangana, Kerala, and Karnataka) were selected. From each state, five Universities were selected on the basis of year of establishment, number of courses offered by the

University and its student's enrolment. The sample of the study constitutes 25 Universities in Southern India, among which from each University 100 students were selected representing both genders. The students were drawn from six basic courses representing Science, Arts and Engineering groups selected on the basis of regularity and seniority. Hence the total sample is 25 X 100 =2500.Stratified Random Sampling Technique was employed in the final selection of sample.

**Critical Factors of Service Quality From the Students Perspective**

To identify the important dimensions of service quality as perceived by University students of South India EFA technique was employed. The factor analysis identified five critical factors which were named as –Governance and Management, Research Consultancy and extension, Curricular aspects &Teaching, Learning &Evaluation and Infrastructure and learning Resources (based on Eigen values>1).The results showed the value of Kaiser-Meyer-Olkin (KMO), is 0.894 a measure of sampling adequacy. The KMO value must exceed 0.50 and the value above 0.8 is considered meritorious (Hair et al., 2008). The total variance explained by all these four factors was 56 percent. The result were significant at 0.05, x2 =8102.415 ($p$ = *0.000*) which clearly indicates the suitability of factor analysis.

**Table 1: KMO and Bartlett's Test**

| | | |
|---|---|---|
| Kaiser-Meyer-Olkin Measure of Sampling Adequacy. | | 0.894 |
| Bartlett's Test of Sphericity | Approx. Chi-Square | 8102.415 |
| | df | 210 |
| | Sig. | 0.000 |

**Table 2: Rotated Component Matrix**

| Items | Components | | | | |
|---|---|---|---|---|---|
| | Governance and Management | Research consultancy and extension | Curricular aspects & Teaching | Teaching Learning and evaluation | Infrastructure and learning resources |
| University follows proper administrative policies and procedures | .645 | | | | |
| Academic and administrative records are maintained accurately | .645 | | | | |
| University follows good governing mechanism | .634 | | | | |
| University looks after the well-being of its vicinity | .633 | | | | |
| Administrative staff are willing to help and understand your specific needs | .589 | | | | |
| University maintains greenery across campus | .587 | | | | |
| University has effective and efficient leadership | .582 | | | | |
| University has foreign collaboration in research projects | | .767 | | | |
| University has collaborations with foreign Universities and promotes international activities like student exchange programme | | .734 | | | |
| University operates an excellent entrepreneurship cell | | .603 | | | |
| University has modern accommodation with all safety and security measures | | .599 | | | |

| | | | | | |
|---|---|---|---|---|---|
| The placement cell works efficiently | | .599 | | | |
| Department has well qualified staff | | | .843 | | |
| Department has adequate staff | | | .720 | | |
| Teachers have positive attitude towards students | | | .698 | | |
| University conducts exams at right time | | | | .779 | |
| University announce results promptly | | | | .747 | |
| Department timely informs exam schedules and time tables | | | | .702 | |
| Library has a wide range of journals and magazines | | | | | .826 |
| Library offers wide range of resources | | | | | .746 |
| Computer labs are equipped with latest software and internet facilities | | | | | .580 |
| Extraction Method: Principal Component Analysis. Rotation Method: Varimax with Kaiser Normalization. | | | | | |
| a. Rotation converged in 7 iterations. | | | | | |

*Reliability test* for the data collection instrument indicated that the Cronbach alpha is 0.884 satisfying the reliability criteria (acceptable standard is 0.5) which indicates the strong reliability of the instrument.

**Scale Development and validation**

The study used AMOS 20 to run the CFA for all the constructs by means of structural equation modeling which was used to evaluate the underlying four factor model where individual items in the model were examined to understand how closely they represent the same construct. The output of explorative factor analysis was considered as underlying measurement model for CFA. The process started with preliminary analysis of the data and developing individual CFA model for each factor of the theoretical factor structure that was identified in EFA. Several runs of CFA were conducted until satisfactory goodness of fit statistics was obtained. During this process, nine items with low variance were removed. After deletion of nine items, a valid scale with three dimensions and nine items emerged. (Fig:1) . The scale emerged after CFA was assessed for goodness of fit statistics.

***Model Fit***: The scale was examined in terms of several goodness of fit statistics. The p-value of 0.00 for the Chisquare statistics implies good absolute model fit. RMSEA value (0.045) is between 0.03 and 0.08, indicates an acceptable level of internal consistency ( Hu and Bentler, 1999) and also implies that the model theory fits the sample data (Hair *etal.,*2008). The fit indices RMR(0.063), GFI(0.974),NFI(0.952),IFI(0.958),CFI (0.958),TLI(0.932) AGFI(0.946). Are all within the recommended tolerances and the normed Chi-square (147.915) is also within the broader recommended range. The amount of squared multiple correlations for all dimensions in the model are more than 0.5 thus indicating acceptable squared factor loadings. All the factor loadings in the CFA model developed are statistically significant at 0.001 level of significance. The fit indices reflect acceptable level of fit and all the indices are within recommended tolerances.

**Table 3- The CFA Goodness of Fit Indices of Scale**

| | **Model value** | **Key goodness of fit indices/level of acceptable fit** |
|---|---|---|
| Chisquare: 147.915 | 6.72 | **If chisquare /df => 0.05 = good fit,< 2 = over fit,≤ 5= Good fit, >5 = adequate fit** |
| df=22 | | |
| P | 0.000 | P < 0.001 |
| GFI | 0.974 | ≥ 0.9 indicates Good fit |

| | | |
|---|---|---|
| AGFI | 0.946 | ≥ 0.9 indicates Good fit |
| NFI | 0.952 | ≥ 0.9 indicates Good fit |
| CFI | 0.958 | ≥ 0.9 indicates Good fit |
| RMR | 0.063 | 0.05 = Good fit,Between0.05 to 0.1,Reasonable fit |
| RMSEA | 0.068 | ≤ 0.05 = Good fit,Between0.05 to 0.1,Reasonable fit |
| IFI | 0.958 | ≥ 0.9 is Good fit |
| TLI | 0.932 | ≥ 0.9 is Good fit, Between 0.850 to 0.9 Reasonable fit |

**Validity of Measurement Model:** All validity tests were conducted to validate the four service quality constructs.

**Face (Content) Validity:** The Questionnaire was developed based on broadly used service quality measurement - SERVQUAL scale (Parasuraman et al., 1988, 1991). The necessary modifications were made in the questionnaire based on suggestions from various experts and academicians thus satisfying the validity criteria.

**Convergent validity**

Factor Loadings, Variance Extracted (VE) and Construct Reliability (CR) (Fornell & Lacker, 1981; Hair et al., 2008) are used to test Convergent validity. The standardized loadings estimates should be 0.5 or higher, and ideally 0.7 or higher. A good rule of thumb is an AVE of 0.5 or higher indicates adequate convergent validity. The rule of thumb for a construct reliability estimate is that 0.7 or higher suggests good reliability. The results of the study (table-6) show that AVE is above 0.5 and C.R is above 0.7 satisfying the above criteria. The CFA standardized factor loadings of each variable in this study is above 0.50. In addition, all Eigen values of constructs are greater than 1.0 also confirm convergent validity (Hair et al., 1998). The study identified that all the extracted variance estimates are greater than squared inter-construct correlations, satisfying discriminant validity (Table-4).Thus, the measurement model reflects good model fit, construct validity and reliability.

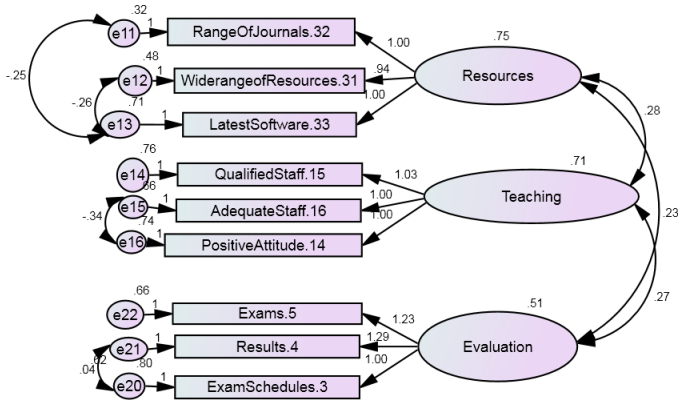


Figure 1: Student Perceived Service Quality Scale

**Table 4- CFA Results of developed Students Perceived Service Quality Scale**

| Constructs | Attributes | SE | C.R | Cronbach alpha | AVE |
|---|---|---|---|---|---|
| Infrastructure and learning resources | Library has a wide range of journals and magazines | 0.837<br>0.760<br>0.715 | 0.7 | 0.709 | 0.5 |
| | Library offers wide range of resources | | | | |
| | Computer labs are equipped with latest software and internet facilities | | | | |
| Curricular aspects & Teaching | Department has well qualified staff | 0.705<br>0.720<br>0.700 | 0.68 | 0.685 | 0.5 |
| | Department has adequate staff | | | | |

| | | | | | |
|---|---|---|---|---|---|
| | | | | | |
| | Teachers have positive attitude towards students | | | | |
| Teaching Learning and evaluation | University conducts exams at right time | 0.736 | 0.68 | 0.753 | 0.596 |
| | University announce results promptly | 0.761 | | | |
| | Department timely informs exam schedules and time tables | 0.625 | | | |
| S.E-Standardized Estimates, A.V.E-Average Variance Extracted, C.R-Construct Reliability | | | | | |

**Table 5- AVE and Squared Inter-Construct (covariance) Correlations (SIC) for Discriminant validity analysis**

| **Dimensions** | Infrastructure and learning resources | Curricular aspects & Teaching | Teaching Learning and evaluation | AVE |
|---|---|---|---|---|
| Infrastructure and learning resources | | | | **0.5** |
| Curricular aspects & Teaching | .390*.390=0.15 | | | **0.5** |
| Learning and evaluation | .376*.376=0.14 | .455*.455=.20 | | **0.596** |
| AVE | **0.5** | **0.5** | **0.596** | |
| Note: AVE in bold | | | | |

Assessment of uni-dimensionality using goodness of fit statistics, scale reliability and construct validity therefore confirmed that the scale which emerged during CFA (Figure1) is a good model. It has three dimensions (Infrastructure and learning resources, curricular aspects & Teaching and Learning and evaluation) and nine items. This model constitutes a service quality scale for measurement of service quality in Universities. The study identified through factor analysis five critical factors of service quality which were named as –Governance and Management, Research Consultancy and extension, Curricular aspects & Teaching, Learning & Evaluation, Infrastructure and learning Resources (based on Eigen values>1). The results showed the value of Kaiser-Meyer-Olkin (KMO) is 0.894 a measure of sampling adequacy. The KMO value must exceed 0.50 and the value above 0.8 is considered meritorious (Hair et al., 2008). The total variance explained by all these four factors was 56 percent. The result were significant at 0.05, x2 =8102.415 ($p$ = *0.000*) which clearly indicates the suitability of factor analysis. *Reliability test* for the data collection instrument indicated that the Cronbach alpha is 0.819 satisfying the reliability criteria (acceptable standard is 0.5). Reliability for all the constructs surpassed the recommended level of 0.60 which indicates the strong reliability of the instrument.

**b). Scale Development and Validation**

The study used AMOS 20 to run the CFA for all the constructs by means of structural equation modeling which was used to evaluate the underlying four factor model where individual items in the model were examined to understand how closely they represent the same construct. The output of explorative factor analysis was considered as underlying measurement model for CFA. The process started with

preliminary analysis of the data and developing individual CFA model for each factor of the theoretical factor structure that was identified in EFA . Several runs of CFA were conducted until satisfactory goodness of fit statistics was obtained. During this process, nine items with low variance were removed. After deletion of nine items, a valid scale with three dimensions -Infrastructure and learning resources, curricular aspects & Teaching and Learning and evaluation and nine items emerged. The scale emerged after CFA was assessed for goodness of fit statistics. The p-value of 0.00 for the Chi-square statistics implies good absolute model fit. RMSEA value (0.045) is between 0.03 and 0.08, indicates an acceptable level of internal consistency (Hu and Bentler, 1999) and also implies that the model theory fits the sample data (Hair*etal.*2008). The fit indices RMR(0.063),GFI(0.974),NFI(0.952),IFI(0.958),CFI (0.958),TLI(0.932) AGFI(0.946) are all within the recommended tolerances and The normed Chi-square (147.915) is also within the broader recommended range. The amount of squared multiple correlations for all dimensions in the model are more than 0.5 thus indicating acceptable squared factor loadings. All the factor loadings in the CFA model developed are statistically significant at 0.001 level of significance. The fit indices reflect acceptable level of fit and all the indices are within recommended tolerances.

Assessment of unidimensionality using goodness of fit statistics, scale reliability and construct validity therefore confirmed that the scale which emerged during CFA is a good model. This model constitutes a service quality scale for measurement of service quality in Universities.

**Conclusion:**

The Uniqueness of this research is developing scale to measure service quality in 25 major Universities of South India based on students perspective using NAAC and NBA Parameters where actually few studies have been done addressing these two aspects in India. The study gives rise to the development of new concepts and models in the area of Higher Education Service Quality. aThis study identified the factors effecting service quality in higher education which plays a vital role in effecting the socio-economic development of the economy. The theoretical framework focused on student perceived service quality has been tested empirically and theoretically in Indian settings.The factor analysis identified five critical factors which were named as – Governance and Management, Research Consultancy and extension, Curricular aspects &Teaching, Learning &Evaluation and Infrastructure and learning Resources.. The Scale with three dimensions-Infrastructure and learning resources, curricular aspects & Teaching and Learning was developed and tested for validity and reliability. The contributions of this study are methodologically significant as it is one of the few studies that tests service quality in Higher Education sector in Indian context. This research has filled gaps in the area of service quality in Higher Education sector by identifying the important predictors of service quality in Indian Universities which can be used in Management research in similar and other countries. Moreover, this study develops its own scale to measure service quality. The research contributes to the existing knowledge both industrial as well as theoretical perspective. The research adds new insights within the education context.

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