Customer Satisfaction on Reliability Dimension of Service Quality in Indian Higher Education

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Abstract—The present research study analyses the students' satisfaction with university performance regarding the reliability dimension, ability of professors and staff to perform the promised services with quality to students in the post-graduate courses offered by Sri Venkateswara University in India. The research is done with the notion that the student compares the perceived performance with prior expectations. Customer satisfaction is seen as the outcome of this comparison. The sample respondents were administered with schedule based on stratified random technique for this study. Statistical techniques such as factor analysis, t-test and correlation analysis were used to accomplish the respective objectives of the study.

Keywords— Satisfaction, Reliability, Service Quality.

I. Introduction

THE word service is related to a task accomplished through human effort to provide assistance to the needy. In the higher education sector, it is difficult to manage the institutions from the marketing point of view because the concept of customer has not been clearly defined. Unlike other service industries, which hold satisfaction as a goal in and of itself, colleges and universities typically perceive satisfaction as a means to an end.

A. Higher Education Institutions in India and Quality Mechanisms

Before independence, access to higher education was very limited, with enrolment of less than a million students in 500 colleges and 20 universities. Since independence, the growth has been very impressive. The number of universities as on December 2011 increased to 634, the number of colleges increased 33,023 (UGC Report Feb. 2012). Today, we have 634 universities, institutions of higher learning and deemed universities, out of which 129 deemed to be universities, 43 institutions of national importance, 42 central universities, 297 state universities, 100 private universities and about 33023 colleges including 203 autonomous colleges. At the beginning of the academic year 2010, the total number of students enrolled in the formal system of education in universities and colleges was 14.6 lakh, 19.1 lakh, and 6.99 lakh teaching faculty employed making India's system of higher education the second largest in the world.

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The main agency which accredits university and colleges in general education is the National Assessment and Accreditation Council (NAAC) established on 16th September. Whereas similar function is done for technical education by the National Board of Accreditation (NBA) set up by AICTE in 1994, and for Agricultural education by Accreditation Board (AB) set up by ICAR in 1996. Some of the other professional regulatory bodies are attempting to set up their own accreditation agencies, for instance both the distance education council (DEC) and the National Council for Teacher Education (NCTE) are currently discussing with NAAC the procedures for developing their own accreditation mechanisms.

B. Customer's Perceptions on Higher Education Products

Students or learners' expectations often consist of what a student believes should or will happen. Learner's perception is a trade-off between the perceived benefits of the education to be undertaken and perceived sacrifice in terms of costs to be paid for the education programs/products. Total cost for learner includes more than monetary price paid for the education products or service. Similarly, the values are more than what the learner gets through his/ her degree. The other values are service value, personnel value and image value [1]. The product value denotes the worth assigned to the education product by the learner. Whereas the personnel value refers to the worth assigned to the service-providing personnel by the learners or customer, and the image value denotes the worth assigned to the image of the service or the service provider by the learner.

C. Service Quality Dimensions in Higher Education

Student assessment of service quality dimensions, such as reliability, assurance, tangibility, empathy and responsiveness of university education.

D. Reliability Dimension of Service Quality

Reliability is defined as the ability to perform the promised service dependably and accurately. In its broadest sense, reliability means that the university delivers on its promises-promises about delivery, service provision, problem resolution, and pricing. Students want to maintain good relations with university that keeps its promises, particularly promises about the service outcomes and core service attributes.

E. Customer Satisfaction in Higher Education

The terms reliability and satisfaction are used interchangeably. *"Service reliability"* is judgment of customers/clients regarding overall performance of the

organization and its services. Primarily service quality focuses on how to meet the customers' expectations. Because expectations are dynamic, evaluations may also shift over time, from person to person and from culture to culture.

The term, *"student satisfaction,"* can be explained in many ways. Kaldenberg, et al [2], discussed and found that in the college, student satisfaction was driven by evaluation of the quality of course work and other curriculum activities and other factors related to the university. Professors should treat students with sensitivity and sympathy, and assistance should be provided when necessary.

F. Need for the Study

It is hoped that the present study will bridge the research gap between customer satisfaction and reliability dimension strategies in the higher education sphere. This study will also help the university to know the level of student satisfaction and also which aspects are the most important and develop their quality of service to increase the satisfaction level of its students.

II. REVIEW OF LITERATURE

An in-depth investigation made into consumers' pretrial multi- expectations of service quality within a higher education context using Zeithmal multi-expectations standards framework [3]. Hasan, Hishamuddin Fitri Abu and others [4] attempted to examine the relationship between service quality dimensions and overall service quality (tangibility, responsiveness, reliability, assurance and empathy) and students satisfaction, examined service quality dimensions from two private higher education institutions. Kenney, Matthew G. and Khanfar, Nile M. [5] explored the relationship between customer satisfaction, service quality and the repurchase intention dimension of consumer loyalty within higher education. The influence of switching costs as a mediating variable was also examined. The setting for the study was the online learning facet of the higher education market. Finney, Treena Gillespie and Finney, R. Zachary [6] examined the relationship between students' perceptions of themselves as customers of their university and their educational attitudes and behaviors, from a medium-sized university in the southern United States. Sia, Mal-Kong [7] found that customer satisfaction was multi-dimensional, with four service quality factors, namely critical, satisfiers, dissatisfies and neutrals.

III. OBJECTIVES OF THE STUDY

1. To analyze the key determinants of student satisfaction on reliability of service quality.
2. To determine the gap between students' expectations and perception on reliability dimension of service quality.

Hypotheses

H_{01}: There is no significant difference in between the influencing factors in so far as their impact on the reliability of service quality.

H_{02}: There is no relationship between selected service quality reliability dimension and overall student's satisfactions in the higher education institution.

IV. RESEARCH DESIGN AND METHODOLOGY

Both primary as well as secondary data were used for the present study to establish causal relationship between the dependent and independent variables. Reliability variable of customer satisfaction consisting academic and non-academic aspects are taken as independent variables while student satisfaction is taken as dependent variable. Likert's five point scale is used to collect the primary data on the opinions of students. The sample unit Sri Venkateswara University was established on September 2, in the year 1954 in the temple city of Tirupati, in the Chittoor district of Andhra Pradesh. Its campus is divided into four constituent colleges, namely College of Arts, College of Commerce, Management and Computer Science, College of Engineering and College of Science with 53 post-graduate departments and with student strength of 2202, from which a sample of 20 per cent (440 students) was selected employing stratified random technique.

V. RESULTS AND DISCUSSION

A. Opinion on Satisfying Attributes of Reliability

The opinions on satisfying attributes of the reliability dimension of services quality has been collected and computed with 't' test and the results are presented in Table I.

Table I shows the expectation and performance (perception of student) on all satisfying attributes of reliability, namely 1, 2, 3, 4, 6, 7, 8, 10, and 19. The difference between expectation of the students and university performance is highest at 0.36 in the case of attribute 3, and lowest at 0.15 in the case of attribute 6. The t-value is significant at 1 per cent level in the case of all the attributes and hence it can be inferred that the mean difference between students' expectations and university performance is highly significant. It is concluded that the university performance must be improved to reach up to the expectations of the students on all the attributes with regard to reliability dimension of service quality.

B. Opinion on Indifferent Attributes of Reliability

Table II: t-test for students' opinion on indifferent attributes of reliability of service quality between students' expectations and the university performance is not significant in the case of indifferent attributes.

The mean difference between expectation of the students and the university performance is highest at 0.15 on the attributes 9 and 12, while it is the lowest at 0.0815 in the case of attribute 11, 17 and 20. The t-value is at insignificant level in the case of all the attributes and hence it can be inferred that the mean difference between students' expectations and the university performance is not significant in the case of indifferent attributes.

C. Opinion on Dissatisfying Attributes

Table III: t-test for opinions on dissatisfying attributes of

reliability dimension attributes and hence it can be inferred that the mean difference

Table III shows that there is a mean difference between the students' expectation and university performance in the attributes of 'the university provides a reliable way for students to democratically express their views' and 'the university provides compensatory service to students who lag behind in academic matters' which is very minute. The t-value is insignificant and hence it can be inferred that the difference between students' expectation and the university's performance on the dissatisfying attributes is not significant.

High Expectation Low			
☞ Statement 1 ☞ Statement 2 ☞ Statement 3 ☞ Statement 4 ☞ Statement 6 ☞ Statement 7 ☞ Statement 8 ☞ Statement 10 ☞ Statement 19		☞ Statement 12 ☞ Statement 14 ☞ Statement 16 ☞ Statement 17 ☞ Statement 20	
☞ Statement 5 ☞ Statement 9 ☞ Statement 11		☞ Statement 13 ☞ Statement 18	
High	Performance		Low

Fig. 1 Portrays the classification of the 20 attributes of reliability dimension in a matrix

Quadrant 1: Attributes of reliability dimension 1, 2, 3, 4, 6, 7, 8, 10, and 19 (High expectation and high performance); *Quadrant 2:* Attributes of reliability dimension 12, 14, 16, 17, and 20 (high expectation and low performance); *Quadrant 3:* Attributes of reliability dimension 5, 9, 11, and 15 (low expectation and high performance); *Quadrant 4*: Attributes of reliability dimension 13 and 18 (low expectation and low performance).

VI. FACTOR ANALYSIS FOR THE STUDENTS' PERCEPTION OF ATTRIBUTES OF RELIABILITY

The principal components factor method was used to generate the initial solution. The eigenvalues suggested that a four- factor solution explained 46.42 per cent of the overall variance before the rotation. The factors with eigenvalues greater than or equal to 1.0 and attributes with factor loadings greater than 0.4 were reported. From the results of the factor analysis the four factors are: factor1, factor2, factor3, factor4.

The overall significance of the correlation matrix was 0.000, with a Bartlett test of sphericity value of 1962.118. The statistical probability and the test indicated that there was a significant correlation between the variables, and the use of factor analysis was appropriate. The Kaiser-Meyer-Olkin overall measure of sampling adequacy was 0.850 which was meritorious.

From the varimax-rotated factor matrix, four factors with 17 variables were defined by the original 20 variables that loaded most heavily on them (loading $\geq$ 0.4). Three attributes were dropped due to the failure of loading on any factor at the level of 0.4 or less. These were 16, 18, and 20 attributes with communalities ranging between 0.234 and 0.384.

To test the reliability and internal consistency of each factor, the Cronbach's alpha of each factor was determined. The results showed that the alpha coefficients ranged between 0.411 and 0.631 for the four factors. The results were considered more than reliable, since 0.60 is the minimum value for accepting the reliability test. The four factors underlying students satisfaction on the reliability dimension of service quality attributes in S. V. University, Tirupati are:

Factor 1 contained 9 attributes and explained 25.428 per cent of the variance in the data, with an eigenvalue of 5.086 and a reliability of 61.0 per cent. The attributes associated with this factor dealt with the required service items, such as 19, 14, 13, 17, 12, 15, and three other attributes namely 16, 18, and 20 were dropped as their factor loading were < 0.5.

Factor 2 accounted for 8.998 per cent of the variance, with an eigenvalue of 1.800 and a reliability of 69.0 per cent. As compared to the factor1 reliability is greater than factor 2 reliability. It shows that stronger views compared to other factors. This factor was loaded with 5 attributes such as 1, 2, 3, 4, and 5.

Factor 3 was loaded with 3 attributes. This factor accounted for 6.322 per cent of the variance, with an eigenvalue of 1.264 and a reliability of 64.1 per cent. These three attributes are 6, 7, and 8.

Factor 4 contained 3 attributes. This factor explained 5.674 per cent of the variance, with an eigenvalue of 1.135 and a reliability of 50.7. These attributes are 10, 11, and 9

Hence, H_{01} "There is no significant difference in between the influencing factors in their impact on the reliability of service quality" is rejected.

VII. CORRELATION ANALYSIS

A correlation coefficient measured the strength of a linear between two variables. In the study, a correlation coefficient measured the strength of a linear between the overall satisfaction of the respondents and four factors. The correlation between overall satisfaction of Students and two factors was positive and was significant at the 0.05 level (2-tailed).

For example, the correlation between overall satisfaction and factor 1 was $0.163^{@}$ (p=0.075); the correlation between overall satisfaction and factor 2 was 0.191* (p=0.037); the correlation between overall satisfaction and factor 3 was $0.117^{@}$ (p=0.203), and the correlation between overall satisfaction and factor 4 was 0.0.277* (p=0.002). Therefore, the study indicated that the correlation between overall satisfaction and Factor 2 and Factor 4 was significant at 5 per cent level and overall satisfaction and factors1 and factor 3 were not significant.

TABLE I
T-TEST FOR STUDENTS' OPINIONS ON EXPECTATION AND SATISFACTION TOWARDS RELIABILITY

S. No.	Satisfying attributes	Means of Student's expectation	Means of University's performance	Mean difference (SE-UP)	t-value
1	The university fulfills promise of providing the latest information on the subject to students	3.50(1.21)	3.21(1.20)	0.29	4.09**
2	University announces examination results promptly and helps you at the right time	3.36(1.34)	3.09(1.35)	0.27	3.65**
3	University delivers on its promise to provide the best lab facilities	3.56(1.22)	3.20(1.24)	0.36	5.05**
4	University provides prompt healthcare facilities to students and staff	3.65(1.21)	3.38(1.22)	0.27	3.67**
6	University evaluates the services of its teachers by collecting the opinions of its Students on them.	3.41(1.28)	3.26(1.26)	0.15	2.94*
7	University collects feed-back the quality of its services from its students	3.33(1.26)	3.19(1.28)	0.14	2.79*
8	University takes action based on the opinions of students	3.35(1.24)	3.15(1.25)	0.20	2.48*
10	University delivers on its promise of providing proper accommodation to students	3.52(1.20)	3.17(1.23)	0.34	4.18**
19	University creates effective environment to the Students to acquire the right personality traits.	3.38(1.19)	3.22(1.20)	0.16	2.98*

TABLE II
T-TEST FOR STUDENTS' OPINION ON INDIFFERENT ATTRIBUTES OF RELIABILITY OF SERVICE QUALITY

S. No	Attributes of service quality	Means of Students expectation	Means of University's performance	Mean difference (SE-UP)	t-value
5	University addresses student grievances in the campus	3.43(1.22)	3.33(1.16)	0.10	1.49@
9	University delivers on its promise to complete the syllabus as per the academic schedule	3.38(1.22)	3.23(1.26)	0.15	1.82@
11	Does the university provide impartial and reliable examination and evaluation system	3.26(1.30)	3.18(1.20)	0.08	0.90@
12	University provides regular and a reliable way of parent-teacher interaction.	3.16(1.25)	3.01(1.31)	0.15	1.73@
14	University creates reliable avenues for students to expose themselves to the latest knowledge and to reveal their creativity	3.35(1.26)	3.20(1.24)	0.14	1.66@
15	University has a reliable and prompt way of appointing the right type of teachers based on changing student and industry needs.	3.38(1.23)	3.27(1.15)	0.10	1.28@
16	Peaceful and student friendly atmosphere on the campus.	3.34(1.16)	3.23(1.26)	0.11	1.38@
17	University provides prompt, effective and reliable information to new-comers about university.	3.37(1.17)	3.29(1.23)	0.08	1.03@
20	University has a reliable way to select and appoint competent non-teaching staff.	3.38(1.19)	3.30(1.27)	0.08	0.92@

TABLE III
T-TEST FOR OPINIONS ON DISSATISFYING ATTRIBUTES OF RELIABILITY DIMENSION

No	Dissatisfying attributes	Means of Students' expectation	Means of University's performance	Mean difference (SE-UP)	t-value
13	University provides a reliable way for students to democratically express their views.	3.18(1.18)	3.20(1.23)	-0.02	-0.37@
18	University provides compensatory service to students who lag behind in academic matters.	3.19(1.19)	3.24(1.29)	-0.05	-0.66@

Source : Field survey
Note: 1. **=significant at 1 per cent level; *=significant at 5 per cent level, @= not significant
2. Standard deviations are in parentheses.
3. The mean of student's expectation ranges from 1 (very dissatisfied) to 5 (very satisfied).
4. The mean of university performance ranges from 1 (very low) to 5 (very high).

TABLE IV
RESULTS OF FACTOR ANALYSIS OF THE OPINIONS ON THE RELIABILITY DIMENSION OF SERVICE QUALITY ATTRIBUTES

Attributes	Factor Loadings				Comm unality
	Factor 1	Factor 2	Factor 3	Factor 4	
Factor 1:					
19. University creates effective environment to the students to acquire the right personality traits.	**.650**	.130	.020	.053	0.443
14. University creates reliable avenues for students to expose themselves to the latest knowledge and to reveal their creativity	**.631**	.012	.148	.058	0.423
13. University provides a reliable way for students to democratically express their views.	**.599**	-.032	.262	.200	0.468
17. University provides prompt, effective and reliable information to new-comers about university.	**.588**	.243	.064	-.107	0.421
12. University provides regular and a reliable way of parent-teacher interaction.	**.574**	.061	.131	.303	0.442
15. University has a reliable and prompt way of appointing the right type of teachers based on changing student and industry needs.	**.547**	.192	-.121	.267	0.422
16. Peaceful and student friendly atmosphere on the campus.	**.465**	.308	-.139	.231	0.384
18. University provides compensatory service to students who lag behind in academic matters.	**.463**	.034	.321	-.081	0325
20. University has a reliable way to select and appoint competent non teaching staff.	**.413**	.184	.113	.114	0.230
Factor 2:					
1. The university fulfills promise of providing the latest information on the subject to students.	.208	**.719**	.087	.004	0.568
2. University announces examination results promptly and helps you at the right time	.119	**.663**	.258	.071	0.525
3. University delivers on its promise to provide the best lab facilities.	.116	**.643**	.158	.045	0.454
4. University provides prompt healthcare facilities to students and staff.	.132	**.618**	-.023	.276	0.475
5. University addresses student grievances in the campus.	.047	**.521**	.365	.032	0.408
Factor 3:					
6. University evaluates the services of its teachers by collecting the opinions of its students on them.	.023	.283	**.742**	-.011	0.631
7. University collects feed-back the quality of its services from its students	.298	.110	**.663**	.235	0.596
8. University takes action based on the opinions of students	.156	.229	**.551**	.278	0.458
Factor 4:					
10. University delivers on its promise of providing proper accommodation to students	.056	.093	.166	**.794**	0.670
11. Does the university provide impartial and reliable examination and evaluation system	.335	-.032	-.007	**.644**	0.528
9. University delivers on its promise to complete the syllabus as per the academic schedule	.050	.295	.196	**.533**	0.411
Eigen Value	*5.086*	*1.800*	*1.264*	*1.135*	
Variance (%)	*25.428*	*8.998*	*6.322*	*5.674*	
Cumulative variance (%)	25.428	34.426	40.748	46.422	
Reliability Alpha (%) (0.450)	**61.0**	**69.0**	**64.1**	**50.7**	
Number of items (Total = 20)	**9**	**5**	**3**	**3**	

Note: Extraction Method – Principal Component Analysis
Rotation Method – Varimax with Kaiser Normalization
KMO (Kaiser-Meyer-Olkim Measure of Sampling Adequacy) = 0.850
Bartlett's Test of Sphericity: p = 0.000 (x^2 = 1962.118, df = 190)

TABLE V
CORRELATION BETWEEN SATISFACTIONS OF THE STUDENTS WITH FOUR FACTORS OF RELIABILITY

		Factor 1	Factor 2	Factor 3	Factor 4
Overall Satisfaction of students	Students Correlation	0.163[@]	0.191*	0.117[@]	0.277*
	Sig.(2-tailed)	0.075	0.037	0.203	0.002
	N	120	120	120	120

Source: Field survey
* Correlation is significant at 0.01 level (2-tailed)
@ Correlation is not significant at 0.01 level

These results revealed support for hypothesis 1 that there seems to be a moderate correlation between overall satisfaction and the selected reliability service quality dimension attributes.

VIII. SUGGESTIONS

The university has to design the objectives of different courses. The management should bring in innovative methods, and new course with a focus on the other extraneous variables, such as government policies, and procedures involved in higher education.

The university has to consider demographic characteristics or aspects related to male and female, government and private, and rural and urban dichotomy. These are areas where the university can make some improvements to increase the satisfaction level of the students. They might try to provide various counseling services on career, education, finance or other issues.

The university has to make more effort especially in the selection of non-teaching staff and technical staff, identify employees with lower educational qualifications and improve their level of independence to help them excel in their work by

providing them suitable training and motivate the existing non-teaching staff. In other areas considerable efforts are very much essential to improve their service quality in terms of reliability.

The results of the study revealed that even if four factors have significant relationship with the overall student satisfaction, factor 3 and factor 4 are more important factors that influenced overall student satisfaction but it showed low mean scores. In other words, they should focus on these factors as they contribute to the overall student satisfaction.

The university may undertake "organization and method" study to identify excess or surplus staff in some branches and transfer them to the needy branches, and maintain day-wise work-done statement of each one of the employee to inculcate the culture of working for institution.

The professors should adapt to new technology in teaching methodology such as PPT files and display of files on line to get the students acquainted with latest knowledge in the subject. For this it is required to extend training in IT firstly for all the professors and enable them to acquaint with.

Professors must be given training in the concerned subject to get themselves abreast of latest topics in their curriculum so that the students can have improved perception of the reliability of their service.

IX. Scope for the Future Research

The survey was conducted only among post-graduate students. Future studies might be conducted with only one category of academia, or more detailed comparisons might be made between science and arts courses. The future research may be focused on other universities in India and abroad and try to find out if the findings are similar. There is a large scope for further research on other dimensions of service quality in higher education among various faculties.

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