

MEASURING SERVICE QUALITY IN HIGHER EDUCATION: APPLICATION OF ECSI MODEL

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ABSTRACT:

Higher education institutions need to establish long term relationships with their stakeholders. The increasing numbers of Higher Education Institutions have resulted in a growing competition for attracting and retaining best students. Students are direct receivers and participators for the higher education service, and their study activities would influence their perceptions and satisfactions to the educational quality. This paper focuses on the potential for applying and measuring student satisfaction and loyalty based on the ECSI model developed to measure customer satisfaction and loyalty. Data was collected from a sample of undergraduate students of colleges affiliated to Bangalore University. The results suggested that not all of the model's paths were significant, although the model fitted the data reasonably well and explained most of the variance in the model's endogenous constructs. It would seem that colleges need to manage image effectively if they are to create student loyalty.

Keywords: Student satisfaction, Value, Loyalty, ECSI

INTRODUCTION:

Higher education is a major contributor in the socio-economic development of any country. India is today one of the fastest developing countries of the world. In order to achieve the higher growth rate, there is need to increase the number of institutes and also the quality of education. Bangalore University thus relentlessly strives to promote excellence in higher education.

Bangalore University was established in 1964 with 32 colleges and a student population of over 1600 as a State University and is the third oldest University in Karnataka. The University is committed to carrying out its services with a holistic approach, to inculcate right values among students in order to produce socially-sensitive citizens. It encourages not only the curricular activities, but also co-curricular, extra-curricular and extension activities. Over 50 years it has grown in leaps and bounds. It has three campuses at Jnana Bharathi (1111.32 acres), Central College (65.32 acres) and Kolar (30 acres). It has 6 Faculties - Arts, Science, Commerce, Law, Education and Engineering with 48

Postgraduate Teaching and Research Departments offering a total of 209 academic programs. There are 3 University Colleges, eleven Autonomous Colleges and 606 Affiliated Colleges with total student strength of about 3.5 lakhs. For a multifaceted development of a student, the Bangalore University is ranked No. 15 among the top 50 Universities in India as per Hansa Research Survey 2014 (published in The Week June 2014). The same survey ranks the University at 5 of the Top 10 Public Universities in South Zone. India Today (June 30, 2014) survey Ranked Bangalore University at No.11 among the top 45 Universities in India.

THE CONCEPT OF ECSI:

The European Customer Satisfaction Index (ECSI) was founded by the European Organisation for Quality (EOQ), the European Foundation for Quality Management (EFQM) and the European Academic Network for Customer Oriented Quality Analysis (FCF) and supported by the European Commission (DG III). A European Technical Committee developed the ECSI methodology, based on a set of requirements (ECSI Technical Committee, 1998), e.g. comparability, reliability, robustness and structural modeling approach. The starting point was the structural model behind the ACSI as described in (Fornell, 1992). It was decided to supplement this model in two ways. First of all an image variable was introduced and secondly it was decided to split perceived quality

into two elements: a product and a service dimension. Apart from this, the two models are identical. The ECSI later became EPSI Rating (European Performance Satisfaction Index) and is a European model to measure customer satisfaction, offering the possibility of benchmarking with businesses, industries, sectors and countries, and a prediction of the future earnings of the businesses. It was further developed by Martensen et. al. (2000) and had been adapted to measure student perception of such generic exogenous latent variables (drivers) as institution image, expectations, quality of human and non-human elements of teaching and learning, and endogenous variables such as perception of value, student satisfaction and loyalty. The model and the associated estimation procedure (PLS) allow calculation of indexes for the generic variables together with the estimated relationships between the exogenous and endogenous variables, which finally provides vital information on the importance of different drivers in creating student satisfaction and loyalty, and thus satisfy some of the requests in the frameworks as to common standards for quality assurance.

Perceived Value has been defined as the benefits customers believe they receive relative to the costs associated with the service's consumption (McDougall and Levesque, 2000). Zeithaml and Bitner (2000) have suggested that perceived value is an overall evaluation of a service's utility, based on customers' perceptions of what is received for what

cost and this view was accepted in the present study.

Satisfaction is the difference between expectations and perceptions of performance. There are two distinct conceptualizations of consumer satisfaction. Short-term satisfaction is transaction specific, while long-term satisfaction is the result of repeated consumption encounters with a service provider (Olsen and Johnson, 2003). In the present study students' satisfaction is the result of many encounters with teaching staff, administrative staff and facilities of the university.

Expectations refer to the level of quality that customers expect to receive and are the result of prior consumption experience with a firm's products or services. Johnson et al., (2001) noted that the effect of expectations is non-significant in a number of industry sectors.

Loyalty, has been defined as "a deeply held commitment to rebuy a prefer service consistently in the future, thereby causing repetitive same-brand or same brand-set purchasing, despite situational influences and marketing efforts having the potential to cause switching behavior" (Oliver, 1999, p.34). There are two possible ways to conceptualize customer loyalty, namely; behavioural, which is based on repeat purchase behaviour; and, attitudinal, which reflects the affective and cognitive components inherent in customer loyalty. The concept of student loyalty implies a rejection of other educational services and

suggests students believe a chosen college is superior to other education institution.

Given those views, the ECSI model, which was originally developed as a very general model to explain customer loyalty, appears to be a useful framework to examine students' interactions with their educational institutions. As the purpose was to examine the ECSI model's usefulness in a student context, a structured questionnaire was developed. It was distributed to 106 undergraduate students of colleges affiliated to Bangalore University. Only 75 were usable. 32% of the sample was male and remaining 68% was female students. The composition of the sample included 20% from humanities, 54% from commerce and management and 26% from science group. The study considered students from Government, Aided and Private institution in the ratio of 31:37:32. 20 students were from 1st year, 31 from 2nd year and 55 from final year classes. The data collected was analysed through PLS-structural equation modeling (SEM).

VARIABLES:

Exogenous latent variables (Independent):

- 1) Support: It consists of 9 variables which included questions on infrastructure and other facilities provided by the college.
- 2) Advising: It consists of 9 variables relating to efficiency of teaching and administrative staff.
- 3) Tutoring: It consists of 5 variables relating to proficiency and quality of teaching staff.

Endogenous latent variables (Dependent):

- 1) Value: It consists of 8 variables relating to development of soft skills.
- 2) Satisfaction: It consists of 8 variables relating to expectations and satisfaction of service quality.
- 3) Loyalty: It consists of 5 variables relating to affinity and loyalty of students towards their college.

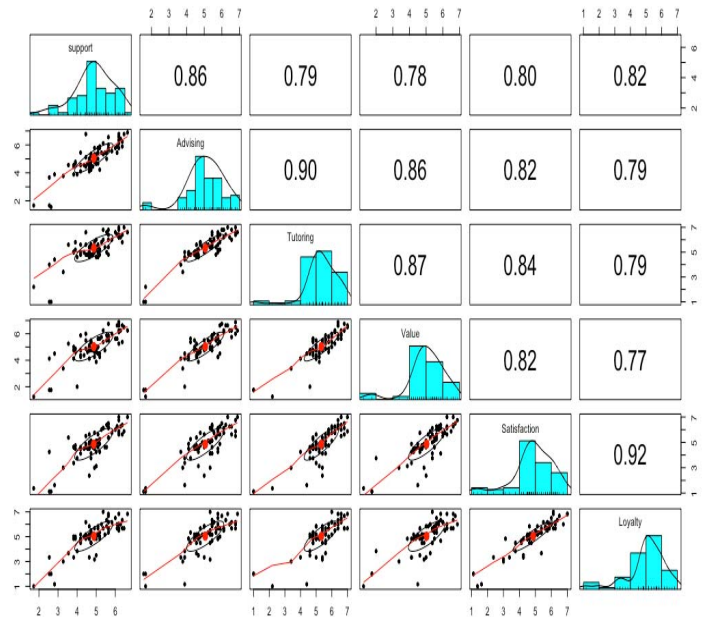
TABLE 1: MEAN AND STANDARD DEVIATION OF THE SUMMATED CONSTRUCTS:

Variables	Variance		Skewness and Kurtosis		
	Mean	S.D.	Skewness	Kurtosis	
Support	57	4.87	1.00	-0.68	0.55
Advising	58	5.06	1.06	-1.05	2.27
Tutoring	59	5.33	1.10	-1.70	4.94
Value	60	5.03	1.09	-1.25	2.57
Satisfaction	61	4.86	1.27	-1.03	1.31
Loyalty	62	5.04	1.22	-1.25	1.88

The items were measured on a 7 point scale ranging from disagree (1) to agree (7), it can be seen from the above table that students were generally happy with their institution as the lowest mean was 4.86 (Satisfaction), while the highest was 5.33 (Tutoring). There are also some variations in those assessments, as can be seen in the standard

deviations, suggesting that further analysis would be useful.

TABLE 2: CORRELATION MATRIX



The diagonal of the table is always a set of ones, because the correlation between a variable and itself is always 1. R value= more than 0.70. Therefore all the variables have very strong positive relationship.

A PLS model consists of two elements.

- 1) Structural model (also called as the inner model) that represents the constructs. It displays the relationships between the constructs.
- 2) Measurement model (also called as the outer model) that displays the relationships between the constructs and the indicator variables.

Table 3: OUTER MODEL

Variables	Weight	Loading	Communality	redundancy
B1	0.14	0.72	0.52	0.00
B2	0.17	0.79	0.63	0.00
B3	0.16	0.78	0.61	0.00
B4	0.16	0.70	0.49	0.00
B5	0.16	0.76	0.57	0.00
B6	0.16	0.83	0.69	0.00
B7	0.14	0.78	0.60	0.00
B8	0.14	0.72	0.52	0.00
B11	0.11	0.63	0.40	0.00
B14	0.14	0.84	0.70	0.00
B18	0.14	0.80	0.65	0.00
B19	0.14	0.84	0.70	0.00
B20	0.14	0.73	0.53	0.00
B21	0.16	0.87	0.76	0.00
B22	0.13	0.77	0.59	0.00
B23	0.13	0.67	0.45	0.00
B24	0.13	0.80	0.64	0.00
B25	0.15	0.81	0.66	0.00
B12	0.24	0.87	0.75	0.00
B13	0.23	0.90	0.81	0.00
B15	0.24	0.89	0.79	0.00
B16	0.25	0.83	0.70	0.00
B17	0.24	0.70	0.49	0.00
B26	0.15	0.79	0.63	0.50
B27	0.15	0.88	0.78	0.63
B28	0.15	0.86	0.73	0.59
B29	0.15	0.83	0.69	0.56
B30	0.10	0.63	0.39	0.32
B31	0.16	0.88	0.77	0.62
B32	0.16	0.86	0.74	0.60
B33	0.17	0.89	0.79	0.64
B34	0.13	0.79	0.63	0.50
B35	0.14	0.84	0.70	0.55
B36	0.17	0.84	0.71	0.56
B37	0.16	0.89	0.79	0.62
B38	0.15	0.80	0.63	0.50
B39	0.14	0.81	0.66	0.52
B40	0.15	0.87	0.76	0.61
B41	0.16	0.89	0.80	0.63
B42	0.24	0.84	0.71	0.62
B43	0.24	0.90	0.81	0.71
B44	0.23	0.90	0.81	0.72
B46	0.23	0.85	0.73	0.64
B47	0.22	0.82	0.68	0.60

The outer model defines how each block of indicators is related to their latent variable. The outer model estimation results (i.e. outer weights, loadings and communality measures) are given in table above. Weights Support (09 items), Advising (09 items), Tutoring (05 items), Value (08 items), Satisfaction (08 items) and Loyalty (05 items) vary 0.11–0.17, 0.13–0.16, 0.23–0.25, 0.10–0.17, 0.13–0.17 and 0.12–0.24, respectively. More weightage was provided by the students for tutoring and loyalty variables. In PLS, individual item reliability is assessed by examining the loading of the manifest variables with their respective construct. A rule of thumb employed by many researchers is to accept items with loadings of 0.70 or more, which implies that there is more shared variance between the construct and its manifest variable than error variance (Carmines and Zeller, 1979; Hulland, 1999; Dwivedi et al., 2006; Kaiser, 1974). In PLS estimation, communality measures the shared variance between the manifest variable and related latent variable (i.e. capacity of the manifest variable to describe the related latent variable) (Fornell and Cha, 1994). In this study, the loadings between manifest variables and their related latent variables are relatively large and positive. All the loadings except loading of B11 and B30 are greater than 0.70. The loading of B11 and B30 are 0.63 respectively. In practice, a low loading might be result of an inappropriate item, a poorly worded item or an improper transfer of an item from one context to another. Although these two loadings are

not too small, it is thought to be as a result of wording. In this application, almost all of the manifest variables are good measure of their latent variables. According to Fornell and Larcker (1981), convergent validity of the reflective constructs can be examined by its average communality (i.e. average variance extracted). A construct’s average communality should be, at least, higher than 50 percent to guarantee more valid variance explained than error in its measurement (Fornell, 1992). In CSI-TMPS model, the average communality scores of support, advising, tutoring, value, satisfaction and loyalty are 0.56, 0.63, 0.71, 0.69, 0.71, and 0.75, respectively. All scores are acceptable. In other words, the correlations between each reflective construct and its indicators that are supposed to measure it are high.

construct differ from measures of other constructs in the same model. In PLS, one criterion for adequate discriminant validity is that a construct should share more variance with its measures than it shares with other constructs in a given model (Hulland, 1999). To assess discriminant validity, average communality measure should be greater than the variance shared between the construct and other constructs in the model. In Table above, while the diagonal elements are the square root of the variance shared between the constructs and their measures (average communality), the off-diagonal elements are the correlations among constructs. Average communality measures of the blocks are greater than the variance shared with other blocks. All the constructs are both conceptually and empirically distinct from each other.

Table 4: CORELATION BETWEEN LVS

Variables	Support	Tu		Satis		
		Advising	toring	Value	faction	Loyalty
Support	1.00	0.86	0.78	0.79	0.82	0.84
Advising	0.86	1.00	0.91	0.87	0.83	0.83
Tutoring	0.78	0.91	1.00	0.87	0.85	0.83
Value	0.79	0.87	0.87	1.00	0.83	0.79
Satis faction	0.82	0.83	0.85	0.83	1.00	0.94
Loyalty	0.84	0.83	0.83	0.79	0.94	1.00

Discriminant validity, the traditional methodological complement to convergent validity, represents the extent to which measures of a given

Evaluation of measurement model:

Table 5: UNIDIMENSIONALITY

Column1	Mode	MVs	C.alpha	DG.rho	eig.1 st	eig.2 nd
Support	A	9.00	0.90	0.92	5.02	0.81
Advising	A	9.00	0.93	0.94	5.68	0.97
Tutoring	A	5.00	0.89	0.92	3.54	0.68
Value	A	8.00	0.93	0.95	5.53	0.79
Satisfaction	A	8.00	0.94	0.95	5.68	0.54
Loyalty	A	5.00	0.91	0.94	3.73	0.52

The above table provides the statistics for checking the unidimensionality of each block. Cronbach’s

and Dillon-Goldstein's values of each block are greater than 0.80. From principal component analysis, first eigenvalue is found greater than 1 and second eigenvalue is less than 1 for each block. These results lead us to accept the unidimensionality of all blocks. The Cronbach's alpha coefficient for variables Support, Advising, Tutoring, Value, Satisfaction and Loyalty is 0.90, 0.93, 0.89, 0.93, 0.94 and 0.91 respectively suggesting that the items have relatively high internal consistency. All the items have high covariances.

Table 6: CROSS LOADINGS

	Satisfaction				
Support	Advising	Tutoring	Value	Satisfaction	Loyalty
0.72	0.84	0.87	0.79	0.79	0.84
0.79	0.80	0.90	0.88	0.84	0.897
0.78	0.84	0.89	0.86	0.84	0.90
0.70	0.73	0.83	0.83	0.89	0.852
0.76	0.87	0.70	0.63	0.80	0.823
0.83	0.77		0.88	0.81	
0.78	0.67		0.86	0.87	
0.72	0.80		0.89	0.89	
0.63	0.81				

Convergent and discriminant validity: It is the extent to which a measure correlates positively with alternative measures of the same construct. The outer loadings and average variance extracted

(AVE) are considered. The rule of thumb is that a latent variable should explain a substantial part of each indicator's variance. Normally the indicator outer loadings should be above 0.708 since the number squared equals 0.50. Generally indicators with outer loadings between 0.40 and 0.70 should be considered for removal from the scale. The outer loadings of all the indicators are more than 0.70. AVE is the grand mean value of the squared loadings of the indicators associated with the construct. AVE is equivalent with communality of a construct. An AVE value of 0.50 or higher indicates that, on average, the construct explains than half of the variance of its indicators. All the block communalities are indicating more than 0.50. AVE values of support, advising, tutoring, satisfaction, value and loyalty are 0.56, 0.63, 0.71, 0.69, 0.71 and 0.75 respectively. Therefore the measure of convergent and discriminant validity is good.

Evaluation of Structural model:

Table 7: SUMMARY INNER MODEL

Variables	Type	R2	Block_	Mean	AVE
			Communality	_Redundancy	
Support	Exogenous	0.00	0.56	0.00	0.56
Advising	Exogenous	0.00	0.63	0.00	0.63
Tutoring	Exogenous	0.00	0.71	0.00	0.71
Value	Endogenous	0.81	0.69	0.56	0.69
Satisfaction	Endogenous	0.79	0.71	0.56	0.71
Loyalty	Endogenous	0.88	0.75	0.66	0.75

The table above shows that more than 50% of the variation in the dependent latent variables – value, satisfaction and loyalty is explained by the exogenous variables. R² Value of latent variable value is 0.81, satisfaction is 0.79 and loyalty is 0.88. The communality coefficient measures the average percent of variance in the indicators explained by that row factor. Like any measure of reliability, the same cutoff criteria as described above apply. All the block communalities are indicating more than 0.50. Redundancy reflects how well the response factors are capable of predicting the variance in its indicator variables. The redundancy coefficient measures the percent of variance in the indicators for the dependent factors explained by the exogenous factors. This may modify the evaluation of R² as a model fit measure. Mean redundancy for value is 0.56, satisfaction 0.56 and loyalty 0.66. The structural model is indicating higher levels of predictive accuracy. It states that the model is strong. Whether a coefficient is significant ultimately depends on its standard error that is obtained by means of bootstrapping. The bootstrapping error allows computing the empirical t value. In bootstrapping, 2000 subsamples were created with randomly drawn observations from the original set of data (with replacement). With this information, t-values are calculated to assess each estimate's significance. The goodness of fit test is used to test if sample data fits a distribution from a certain population. The goodness of fit is 0.74 which indicates that the sample data represents the

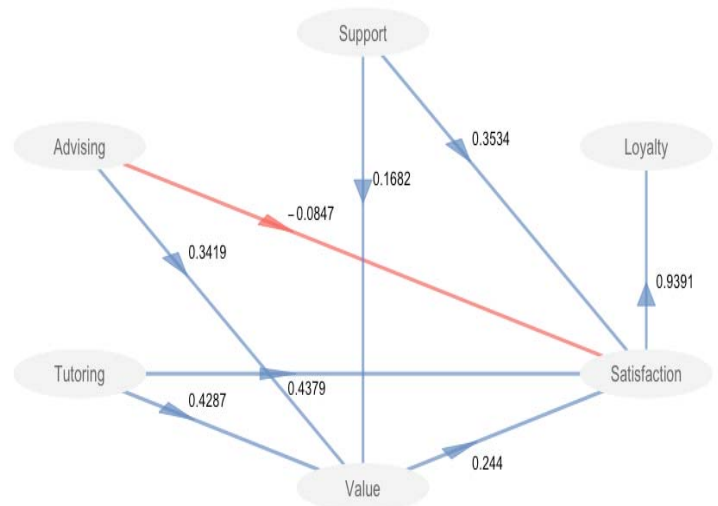
actual population. These scores are very close to 1.0, a value of 1.0 indicates a perfect fit.

Table 8: TOTAL EFFECTS

Exogenous variables	Effect on value	On satisfaction	On loyalty
Support	0.17	0.39	0.37
Advising	0.34	0.00	0.00
Tutoring	0.43	0.54	0.51

The estimated impact of the four exogenous variables on value, satisfaction and loyalty can be calculated by adding direct and indirect effects. Tutoring has by far the largest impact on satisfaction (0.54; i.e. a 1-point increase in tutoring increases satisfaction by 0.54) followed by support (0.37). Advising does not have any impact on satisfaction and loyalty.

FIGURE 1: SHOWING THE PATHS



The study showed that no relationship exists between support and advising, support and tutoring. However it has direct relationship with value and satisfaction, indirect relationship with loyalty. The figure below shows no path between advising and tutoring, advising and loyalty, direct effect with value and negative effect with satisfaction. Tutoring has direct relationship with value and satisfaction and indirect relationship with loyalty. Value has direct effect on satisfaction and indirect relationship with loyalty. Satisfaction has a direct effect on loyalty.

CONCLUSION: Preliminary data analysis showed that the latent variables' internal-consistency and reliability was acceptable. Overall, we believe that the EPSI model can prove to be an essential tool in future quality enhancement in Higher Education. Results in this paper and in similar research prove that this concept used in measuring student satisfaction and loyalty combines a number of traits that can provide useful information for continuous quality improvement of study programmes, teaching and support services in higher education institutions. Besides, the model is easy to present and thus make the results understandable at different levels of educational management and leadership.

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