Importance-Satisfaction Model For Quality Improvement: The Case Of Higher Education

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Abstract

Students are the reason of being of Higher Education Institutions. Times have changed, so their future depends on their capacity to attract and retain students. In this context, it is crucial determining the importance that students place on the product or service attributes that drive their satisfaction with service providers is an essential part of a Higher Education Institutions resource allocation process. An uncomfortable issue is whether importance measures should come directly from students or be derived statistically and, if so, how.

This study attempts to determine the key quality factors influencing student's satisfaction in Higher School of Technology and Management of Bragança (ESTiG), Bragança Polytechnic Institute (IPB) through knowledge of the importance and satisfaction level assigned to each of the factors identified by students. Applying a factor analysis, this study identifies nine quality factors. The research method has an advantage in that it not only identifies the quality factors, but also measures the service quality items of the ESTiG. So, the survey results of this case study demonstrate in general students are satisfied with the service that offers them ESTiG, under to the Importance-Satisfaction Model.

Keywords: Quality of Services; Higher Education; Importance-Satisfaction Model; Bragança Polytechnic Institute.

1. Introduction

Higher education has, in its guidelines, the role of producing knowledge based on the development of science, technology and people as a social being. In its turn, the Higher Education Institutions (HEIs) need to be committed to the quality of services provided, by directly influencing the economic, cultural and social development in regions where they operate. The positive attitudes of a service lead to increased customer retention. The withdrawal or loss of a client (student) reduces revenues and higher education institutions can generate the weakening of its image among potential candidates. In turn, customer satisfaction (student) and perceptions of superior encourage behaviors favorable to providing the service.

The service evaluation of teaching is based significantly on the characteristics of past experiences and beliefs consist of various attributes related to quality of services and are considered by the student in the process of evaluation and decision. According to Kotler and Keller (2005), meet and satisfy customers better than competition, is the key to a profitable development.

Quality has become an important subject of discussion among Higher Education Institutions, and has been extensively studied in recent years. One of the main ways to retain students is determining if they are satisfied with the institution performance as they compare to what they expected when their arrival at the institution, and during the frequency at academic years.

Nowadays one of the appropriate techniques to measure service quality in education is the Importance-Satisfaction Analysis.

In this context, the main reason of this study is to determine the key quality factors influencing student's satisfaction in Higher School of Technology and Management of Bragança (ESTiG), Bragança Polytechnic Institute (IPB), through knowledge of the importance and satisfaction level assigned to each of the factors identified by students. Applying a factor analysis, this study identifies nine quality factors. The research method has an advantage in that it not only identifies the quality factors, but also measures the service quality items of the ESTiG.

Discussion of this paper will be in the following sequence: i) review importance-satisfaction model; ii) methodology, research objectives, and research result; and iii) finally, the conclusions are described.

2. Importance-Satisfaction Analysis

The higher education institutions to keep their students should seek to satisfy them. According to Aktas, Aksu and Çizel (2007) the image of an institution influences their choice and affects the behavior of students. Loyalty is the result of the recognition that attracts and retains customers and linked to the ability to differentiate services, as well as the conviction that the institution will offer them a consistent quality. This analysis involves the simultaneous consideration of evaluations from customers about the importance of the most important attributes and their level of satisfaction with the service provided.

Therefore, the application of Importance-Satisfaction Analysis was based on the Importance-Performance Analysis developed by Martilla and James (1977). The performance has been replaced by satisfaction, since it considers that satisfaction has become the main measure of service quality (Tonge & Moore, 2007; Aktas, Aksu & Çizel 2007; Matzler, Sauerwein & Heischmidt, 2003). For Baker and Cromptom (2000), cited by Tonge and Moore (2007), they define performance as a measure of production that results in satisfaction. According to these authors, the satisfaction provides information to analyze the performance of a results-based institution. When comparing the importance to the satisfaction of certain attributes, it identifies the areas in which to intervene and focus on service performance/satisfaction. Figure 1 identifies the attributes that in the first place are the most important for the client and have the greatest impact on satisfaction and on the other hand, attributes that provides a low satisfaction and therefore need to be improved by management. In Figure 1 can be viewed four quadrants to delineate four different strategies.

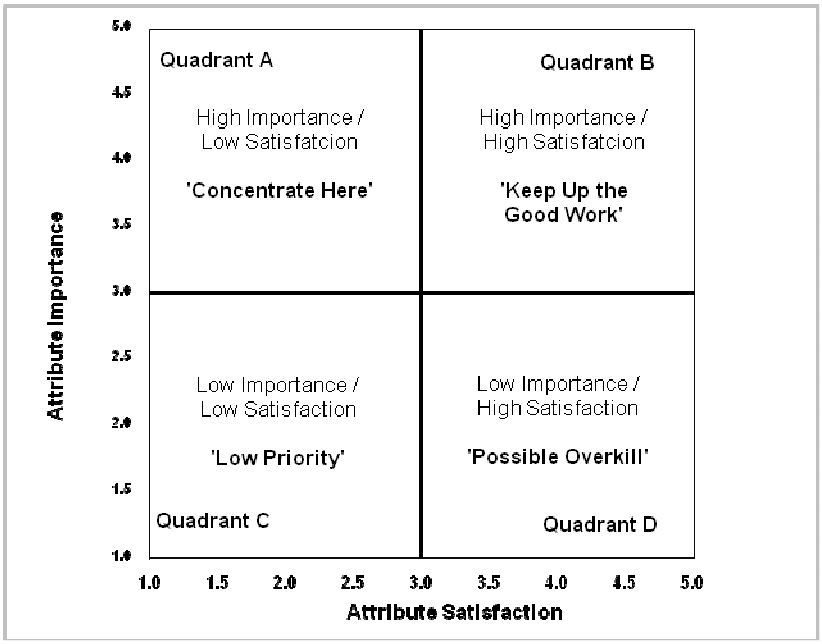

Fig.1. Importance-Satisfaction Matrix (Adapted from Matzler, Sauerwein & Heischmidt, 2003, p. 115).

Low satisfaction on highly important attributes demands immediate attention, in order to improve overall satisfaction, HEIs should 'concentrate on these attributes' (Quadrant A). If they are ignored, this poses a serious threat. Attributes in Quadrant B evaluated high both in satisfaction and importance, represent opportunities for gaining or maintaining competitive advantages. In this area a HEIs should 'keep up the good work'. Quadrant C contains attributes both low in satisfaction and importance. Typically, it is not necessary to focus additional effort here. These product or service attributes are of 'low priority'. Attributes located in Quadrant D are rated high in satisfaction but low in importance. This implies that resources committed to these attributes would be better employed elsewhere. High performance/satisfaction on unimportant attributes indicates a 'possible overkill', (Matzler, Sauerwein & Heischmidt, 2003).

It should be noted that the definition of the x-axis of the Cartesian graph was maintained over the years by some authors and changed by others, analyzing the performance or satisfaction depending on the phenomenon under study.

To construct the matrix Martilla and James (1977), Tonge and Moore (2007) recommend the use of the average range of the scale for crossing axes. Martilla and James (1977), Lynch, Carver and Virgo (1996) indicates that should still be considered the median value of the data presented to cross the axes, based on the trend of responses. Other authors *e.g.*, Zhang and Chow (2004), Aktas, Aksu and Çizel (2007), Rial, *et a*l. (2008), Lee and Lee (2009), Matzler, Sauerwein and Heischmidt (2003), recommend the use of average results, to define the intersection of the axes of cartesian graph, found for each axis.

3. Importance-Satisfaction Model for Quality Improvement: Empirical Study

3.1. Methodology

The data for this study were collected in classroom, applying a questionnaire to the students who attend the undergraduate and master degree programmes at the School of Technology and Management of Polytechnic Institute of Bragança, located in Bragança town, Portugal.

The questionnaire contained 42 items reflecting the dimensionality of importance and satisfaction with service levels of Higher Education Institutions. The final questionnaire was divided into three parts, as follows: (i) Demographics survey; (ii) Importance survey: Responses requested on a five-point Likert scale ranging from 'Very unimportant' (1) to 'Very important' (5); (iii) Satisfaction survey: Responses requested on a five-point Likert scale ranging from 'Strongly Disagree' (1) to 'Strongly Agree' (5).

The survey was conducted during April and May of 2010, in 2nd semester of the 2009/2010 academic year. A total of 695 valid questionnaires were received, which represents 34% of total population (2.031 students). The sample size resulted in sampling error of 3,7%, assuming a 95% confidence level.

3.2. Results and Discussion

3.2.1. General Characteristics of Sampled Students

Table 1 lists some characteristics of the respondents. The original sample consisted in 695 students, 46% female and 54% male, and the majority has between 20 and 25 years old and coming from undergraduate programs, 57,8% from engineering sciences and 42,2% from management sciences. We can also observe the distribution of the sample by year of attendance, where 38% of students attend 2nd year, followed by 1st academic year with 32%, 21% for the 3rd and 9% of students are to attend the 1st academic from the master degree.

Table 1: General Characteristics of Sampled Students.

Variable	No.	%
Gender		
Female	320	46,0
Male	375	54,0
Age		
< 20 years old	152	21,9
20-25 years old	466	67,0
26-30 years old	49	7,1
> 30 years old	28	4,0
Study Areas		
Engineering Sciences	402	57,8
Management Sciences	293	42,2
Academic Year		
1st year	226	32,0
2nd year	262	38,0
3rd year	145	21,0
1st year (Master Degree)	62	9,0

3.2.2. Key Quality Factors Influencing Students Satisfaction

Aiming to analyze how these variables relate and reduce the number of variables to see which dimensions most used by students in assessing the quality of services provided by the ESTiG, a factor analysis was performed.

Reliability was assessed by Cronbach's alpha using SPSS software. Cronbach's alpha for the group of variables (Importance and Satisfaction) analyzed by student was 0,954, this coefficient indicating that the questionnaires were extremely reliable. Table 2 shows the

results for the nine dimensions found. As can be seen in the table, all dimensions but one had a Cronbach's alpha of greater than 0,70, which indicated high reliability (Pestana & Gageiro, 2008). These results demonstrated that the questionnaires were extremely reliable. In terms of validity, the questionnaire had been designed on the basis of related studies.

According to the value found for the Kaiser-Meyer-Olkin (KMO) test (0,946) can be considered that may apply to Factor Analysis. In turn, the Bartlett test of Sphericity is significant, assuming a significance level of 0,05, verifying that there is a correlation between the variables, which makes the proper application of Factor Analysis of these data.

For the extraction of factors, enabling to describe the data, we used the method of principal components based on the assumption of eigenvalues equal to or greater than one, and to facilitate interpretation the Varimax rotation method. So, we retained nine factors (Table 2), and they explain nearly 70% of the total variance. This value is considered satisfactory when it comes to scientific studies applied to the area under review.

Table 2: Reliability of the Nine Quality Factors identify by Students, for ESTiG.

Dimensions/Quality Factors	**Cronbach's alpha**	**% of Total Variance**	**Eigenvalues**
Factor 1: Academic Services	0,946	35,79	15,03
Factor 2: Qualified Education	0,916	7,09	2,98
Factor 3: Social Services	0,923	5,88	2,47
Factor 4: External Relations	0,801	4,89	2,05
Factor 5: Quality and Accessibility of Facilities	0,715	4,30	1,80
Factor 6: Infrastructure to Support Learning	0,797	3,15	1,32
Factor 7: Helpfulness and Functionality of the Library Service	0,792	3,01	1,26
Factor 8: Availability of Social Support to Students	0,814	2,88	1,21
Factor 9: Extra-Curricular Activities	0,744	2,70	1,13

3.2.3. Importance-Satisfaction Model for Quality Improvement

Once identified, the students, the quality factors of the services provided by the School of Technology and Management, was purpose for this research to analyze the satisfaction of students as to what is offered by ESTiG and how it provides its service, applying to the Importance-Satisfaction Model.

Table 3 presents the average values for each of the factors that measure the quality in terms of importance and satisfaction. Thus, students are very satisfied with: the Quality and Accessibility of Facilities, the Qualified Education (Teaching) and External Relations. Factors that are identified with lower satisfaction were: F1 - Academic Services and F9 - Extra-Curricular Activities.

Table 3: Averages of the factors identified for the attributes that measure quality.

Factors/Dimensions	Importance	Satisfaction
F1 - Academic Services	4,27	3,14
F2 - Qualified Education	4,47	3,54
F3 - Social Services	4,24	3,33
F4 - External Relations	4,46	3,72
F5 - Quality and Accessibility of Facilities	4,29	4,01
F6 - Infrastructure to Support Learning	4,32	3,45
F7 - Helpfulness and Functionality of the Library Service	4,36	3,32
F8 - Availability of Social Support to Students	4,34	3,45
F9 - Extra-Curricular Activities	3,66	3,11
Total Average	**4,26**	**3,45**

Representing the values obtained in the Importance-Satisfaction Matrix (Figure 2) showed that the factors were divided into three quadrants, showing the perception of student satisfaction with the service provided by the School of Technology and Management of Bragança. For the intersection of the axes we use the aggregate averages for each dimension, importance and satisfaction.

The Quadrant integrates the factors of high importance and ranked below average satisfaction, which are the Factors 1 and 7, Academic Services and Helpfulness and Functionality of the Library Service, respectively. Factors located in this quadrant are of the utmost importance to students, the latter being those that are performed in the most poor in this institution or at least being perceived as such. Given the importance of these factors, the ESTiG efforts should focus on these services in order to meet the students.

Factors like Qualified Education, External Relations and Quality and Accessibility of Facilities Factors, Infrastructure to Support Learning and Availability of Social Support to Students had high importance and satisfaction, they appear well located in quadrant B, however the importance is above average. These factors are extremely important for students and perform well, so ESTiG should continue the good work reflected in the variables encompassed in these factors.

Quadrant C represented by the low importance and satisfaction and contemplated Factor 9 -Extra-Curricular Activities and Factor 3 - Social Services. However, the Factor 3 is located on the border of the quadrant, so it requires some attention, while the Factor 9 is not worrying because it is considered of low importance for the students.

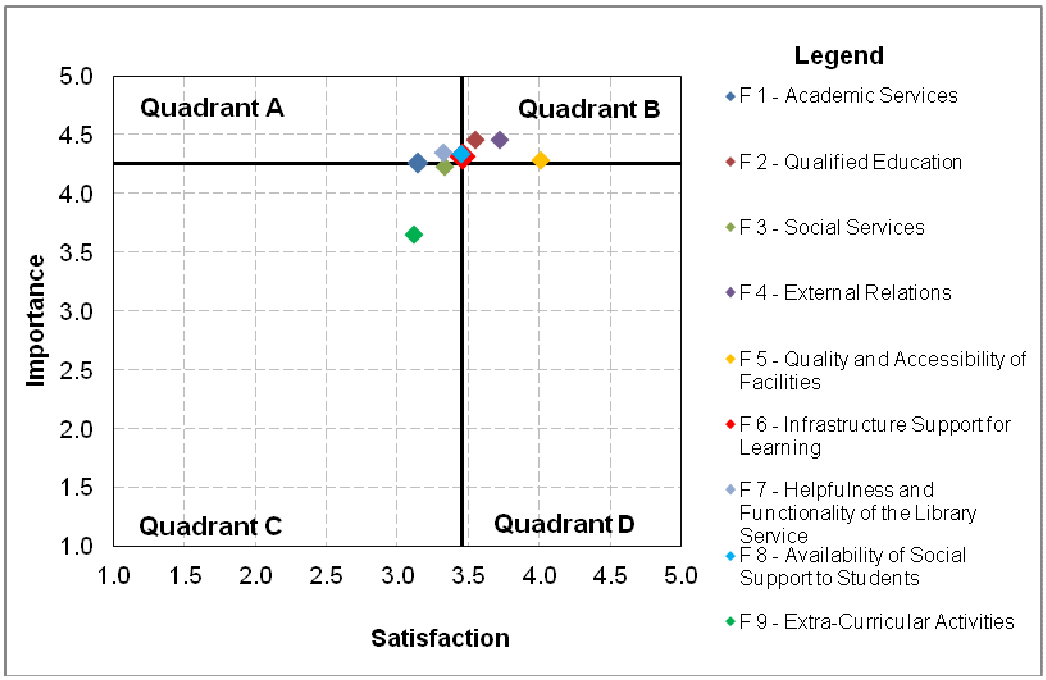

Fig. 2. The importance-Satisfaction Model relative value of the case study.

According to the figures and in the opinion of the authors of this research, the ESTiG board of directors and the Presidency of the IPB must set priorities and act on the attributes that make up Factor 1 - Academic Services, since this factor had a variance explained of 35,788%, the most important factor in explaining the data in this investigation. Still, according to the same, this factor is really important to the institution's image, as being one of the first services that students enjoy one of the first contact they have with the institution, it is essential that this service exceeds expectations of students, in order to retain students, newcomers to the institution. Also Factor 3 - Social Services and Factor 7 - Helpfulness and Functionality of the Library Service, also require intervention by the board Presidency of IPB and ESTiG.

4. Conclusions

The identification of Quality Factors Influencing Students Satisfaction can help managers understand their relative importance and propose improvement plans where the sufficient resources are not focus enough. Based on the literature review and empirical study, this study identifies nine Quality Factors for the Higher School of Technology and Management of Bragança: Academic Services; Qualified Education; Social Services; External Relations; Quality and Accessibility of Facilities; Infrastructure to Support Learning; Helpfulness and Functionality of the Library Service; Availability of Social Support to Students and Extra-Curricular Activities.

According to the results obtained by Importance-Satisfaction Model, we conclude that in general students are satisfied with the service that offers them ESTiG, as most factors are located in Quadrant B (high importance and high satisfaction), except factors related to the provision of Academic Services, the provision of Social Services and Helpfulness and Functionality of the Library Service, in terms of attendance.

The model developed could be accurately considered as a useful tool for selecting the most efficient improvement items to reach student satisfaction. The resources of organizations can then be boosted to maximize efficiency. Higher Education Institutions that apply quality factors can achieve a competitive advantage due to the fact that the managers would be in a better position to provide the greatest satisfaction by improving service quality and marketing strategies for students.

This study presented a complete assessment model that helps Directors of the ESTiG-IPB to locate improvement items, and promotes efficiency and timeliness of service processes following considering cost and time.

Acknowledgments

This work has been supported by the School of Technology and Management of the Polytechnic Institute of Bragança (Portugal). The authors would like to thank the students who answered the questionnaires and the teachers at ESTiG for allowing time in their classes for carrying out the investigation. We would also like to thank ESTiG's Principal for authorizing the use of the questionnaires in the Institution.

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