

The SERVQUAL instrument to measure service quality in higher education – A case study

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Abstract. Students and employers, are the "clients" of Higher Education Institutions (HEI), so it is important to obtain their feedback on the quality of HEI and the courses they attend. This article aims to listen to students' opinion as "clients" of higher education, based on their expectations and perceptions, to measure the quality of the service of HEI. The results from empirical research were presented on the measurement of expectations and perceptions to assess the quality of services provided by a HEI perceived by students, based on observations obtained through survey. Quantitative methodology and data analysis techniques were applied. The SERVQUAL questionnaire was filled by 271 students who attended the 1st, 2nd and 3rd year of the five undergraduate courses taught by the institution, in the academic year 2021/2022. The values obtained for the expectations were very high which translated into negative deviations (Gaps). Thus, we can conclude that ESCE students are very demanding, have high expectations or are very demanding when they classify perceptions by assigning them low values.

Keywords: Higher Education, Service Quality, SERVQUAL

1 Introduction

Schools have generally been outside the concepts and theories of management. However, a school is an organization, with a similar structure to the one of the public companies.

In the current political and economic context, characterizes by cuts in the budget and shortage of students, Higher Education Institutions (HEIs) directors started to give greater attention to the problem of quality and to act as a company in the global market.

Thus, HEI, which in the past did not have to concern to attract students (the number of students applying for Higher Education was always much higher than the vacancies available, even considering competition from institutions private) have had to readapt to a very different reality in recent years. The decrease in the birth rate that has been observed in Portugal (Figure 1), has contributed to the decrease in the student population applying for higher education, so, there is more supply than demand according to the market laws. In another hand, HEI are integrated in a competitive market, and they face challenges due to the evaluation of the results of the services of education and training that they offer. The school

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increasingly needs to be competitive to make the difference from its competitors through the quality of education and reputation of the institution. Prestige is constructed on quality objectives. There is a need for urgent changes in the education system and schools. This can be obtained by the implementation of a new model of management centered on the quality of services supplied to customers.

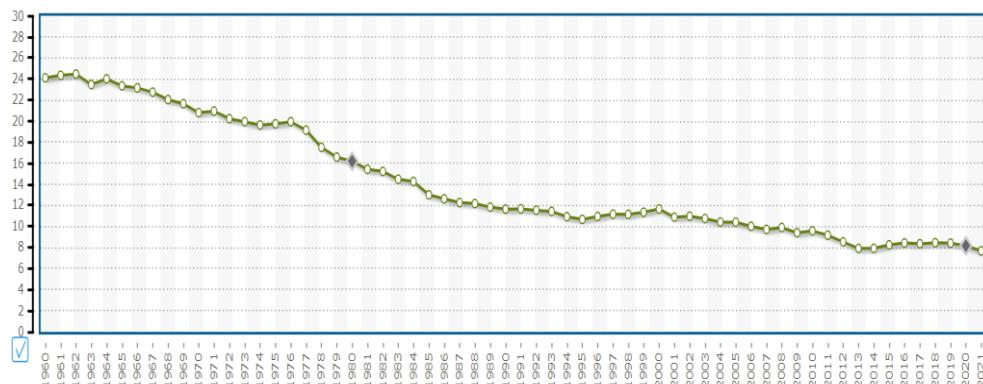


Fig. 1. Birth Rate Evolution (1960-2021).

Source: <https://www.pordata.pt/Portugal/Taxa+bruta+de+natalidade-527>.

The Portuguese higher education system is now characterized by: high number of public and private institutions; excessive numbers of graduation courses; absence of a relationship between educational activities and academic research and an inappropriate name of courses for marketing purposes.

In this context, quality plays a key role in differentiating the offer and will influence students' choice, forcing HEIs to prioritize these aspects, as they cannot remain outside the concepts and theories of marketing and management.

Another challenge relates to the evaluation of the results of the education and training services they offer, by external entities. To this end, structures were created with the aim of evaluating and monitoring the activities carried out by HEIs, such as the Higher Education Assessment and Accreditation Agency (A3ES). The main objective of A3ES "is to improve the quality of performance of higher education institutions and their study cycles and ensure compliance with basic requirements" (in <http://www.a3es.pt>).

This article aims to listen to students' opinion as "clients" of higher education, based on their expectations and perceptions, to measure the quality of the service of HEI and to identify characteristics of services that are important to students in order to provide guidelines for ESCE's strategic planning. By having access to this information, ESCE can accomplish its mission more efficiently.

Research Questions:

1. Does quality in education have 5 dimensions as is out forward Parasuraman et al. to the quality of services?
2. Do the dimensions have the same relative importance?
3. Are the dimensions identified as most important by the students included as priorities in the strategic planning of ESCE – IPS?
4. What are the most important determinants of overall service quality in ESCE?

The paper is organized as follows: Section 1 describes the theoretical basis and presents SERVQUAL Model as well as the description of the Expectations versus Perceptions as basis

of this construct. Section 2 - Data and Methods, presents the methodological approach applied in the analysis of data gathering and the description of the case study. Section 3 shows some of the results and introduces a discussion of findings. At the end, Section 4, presents the identified limitations and future research directions.

2 Theoretical basis

In this section, we introduce a literature review os the SERVQUAL Model and a brief description about other models that can be applied to measure HEI service quality.

2.1 SERVQUAL model

SERVQUAL is a multidimensional research instrument designed to measure service quality by capturing respondent's expectations and perceptions along five dimensions of service quality [1, 2].

According to the same authors [2, 3], the main objective of the SERVQUAL model is to design measurement scales that allow evaluating the quality of services based on the difference between expectations and perceptions of customers. The service expected by the customer is the standard or "benchmark" against which experiences are compared; as performance exceeds expectations, service quality increases and vice versa.

The measurement of quality in services is characterized by being complex, abstract, multifactorial (influenced by multiple factors with different weights) and intangible and is defined as the degree of adjustment between the characteristics of the service and the attributes valued by the customer. These characteristics are not always easy to translate, due to the nature of the service itself, which enjoys the following characteristics: intangibility (it has no physical existence, cannot be viewed or touched, which prevents the establishment of precise specifications), perishability (production and consumption occur simultaneously), inseparability (the customer participates in the production process, being able not only to participate passively, but also as a co-producer of the service) and variability (their performance varies from person to person, from consumer to consumer and from day to day).

If we intend to define service, [4] defines it as a process constituted by a set of intangible activities that, generally but not always, are carried out through interaction between customers and resources of the entity providing the service (human, physical and computer resources), activities that are provided as solutions to customer problems.

[5], states that a service is a psychological and fundamentally personal result. For this author, the purpose of listening to customers about what they are experiencing is to find out what to improve to keep customers or get new ones. The customer's participation is an excellent opportunity to listen to him; [6] states that all major service quality studies agree that service quality is so subjective that it can only be measured in terms of what consumers want or define as quality.

Expectations versus perceptions

The SERVQUAL model measures the expectations - what the customer expects to get from a given experience or service and constitute a frame of reference or basis for the consumer to evaluate the performance of each service. Customer expectations, when correctly identified, are valuable information for organizations.

The model also measures customers' perceptions of the service they experience, which reflect their experience.

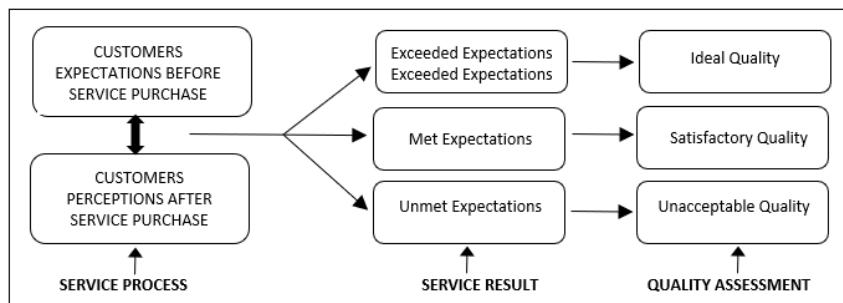


Fig. 2. SERVQUAL Model.

Source: Own processing.

As observed in Figure 2, Service Process is measured by the difference between customers' expectations before service experience and their perceptions after service experience. The result of this difference can be positive, null or negative. If it is positive, the service exceeded the customer's initial expectations and customers classify service quality as ideal; if it is null, quality is classified as satisfactory; if the result is negative, the perception of service quality has not the best and didn't achieve customers' expectations; in this case quality is considered unacceptable.

2.2 Other models

There are other models to measure the quality of services in education, such as HEdPERF (Higher Education Performance-only) as used by [7]. In their study, the authors proposed 41-item instrument based on the SERVPERF model. The purpose of this scale is to measure service quality specifically in the higher education sector, as according to the author, the generic scales presented previously may not be adequate for this purpose. The results were crucial because previous studies have produced scales that bear a resemblance to the generic measures of service quality, which may not be totally adequate to assess the perceived quality in higher education. Previous research focus only on academic's quality and gives few attention to non-academic aspects of the educational experience.

The European Foundation for Quality Management (EFQM) is another model applicable to measuring quality in services. This excellence model has been widely used by Higher Education Institutions (HEIs), but knowledge about its application in the context of HEIs is still limited [8, 9].

This research [10, 11] presents the comparison of the SERVPERF model with other generic instruments. determine which of these three instruments has superior measurement capacity in terms of one-dimensionality, reliability, validity and explained variance of service quality. The HEdPERF, designed exclusively for higher education, is empirically tested as the most comprehensive and industry-specific scale.

3 Data and methods

In order to test the SERVQUAL model and answer the listed research questions, the questionnaire was applied to ESCE (School of Business Administration) students at the Polytechnic Institute of Setúbal.

3.1 Case study – ESCE

ESCE was founded in 1994, and from the beginning sought an opening strategy that would allow ESCE to offer its students, courses that would provide training to integrate them into the business world. Although the school did not have it at the time, a culture of quality was being built in the continuous search for higher levels of performance and this has been its aim in recent years. Being competitive is having the ability to respond to market needs. ESCE knows that the differentiating factor between HEIs is related to quality improvement, which is why it has institutionalized a set of procedures capable of permanently evaluating the pedagogical functioning of the subjects and the quality of the teaching-learning process.

3.2 Methodology

The case study is one where the modified SERVQUAL Model was applied to ESCE to measure the students' expectations and perceptions of the service quality carried by this institution. A quantitative methodology was used, and data analysis techniques were applied to the available elements, with the aid of the SPSS statistical software. The SERVQUAL questionnaire (Appendix 1), using a likert scale of 7 points, was completed by a stratified sample of 271 students, attending the 1st, 2nd and 3rd years of the five undergraduate courses offered by ESCE in the 2021/2022 academic year. The questionnaires were distributed by email to students using the Survey Monkey platform. The response rate was 26%.

This SERVQUAL questionnaire includes a third section, that measures the relative importance of the five dimensions to the students. These scores are then used to weight the perceived service quality measure for each dimension.

To proceed to the interpretation of Principal Components (PC's), we used Oblimin rotation, the same method used by [2]. We found the first PC is related to Reliability and the fourth PC is Tangibility. This two PCs are the same dimensions defended by the authors. The other PC's do not coincide exactly with the model; the second PC corresponds to Reputation, and is constituted by the questions G16, G18, G20, G21 and G22; third dimension can be assigned for Professors, and the last by Attendance Level (G19) - (Appendix 1). A measuring instrument such SERVQUAL scale needs to have trustworthiness and validity in acceptable degrees. To measure the reliability of the dimensions, we calculated Croanbach's Alpha coefficient to analyse the internal consistency of the scale for the variables (items) restrained in each dimension. We consider acceptable coefficients bigger or equal to 0.7 [12]. The values obtained for the Alpha of Croanbach in the 22 items was 0.86 (Appendix 2). That value indicates that items can be applied to the analysis with acceptable reliability.

4 Results and Discussion

The results of the questionnaire allow us to observe that the students who answered the survey attributed greater importance to the "capacity of the teaching staff" and the least important dimension was the "appearance of the physical equipment". In literature, we always find reliability first and tangibility last. The other three dimensions in the path without specific order a time that varies according to the area of application, therefore it coincides with our results. As followed by the authors, the GAP variable was calculated (Gap results from the difference between expectations and perceptions, and which will be identified by G1, G2, ..., G22). Then, principal component analysis (PCA) was applied. The values obtained for expectations are very high, resulting in negative gaps. Only the Tangibility dimension items show positive differences, so we can conclude that ESCE students are quite demanding and have high expectations. The data were adjusted for the application of the PCA using the Bartlett Test, where p-value = 0.000, and Kaiser-Meyer-Olkin Statistics (KMO) = 0.840. We

used Kaiser criteria and scree plot to extract the five main components. The retained components explain 64.38% of the accumulated variance. To proceed with the interpretation of the components, oblique rotation was applied, as in the original SERVQUAL Model.

The use of expectations in measuring the quality of services is particularly important because they provide essential information in situations where different groups have similar perception values, which would make us think that there were no differences in the assessment of quality. However, analysing the expectations and consequently the values of the gaps (differences), the conclusions may change.

It is strategic for Higher Education Institutions to know the level of student satisfaction, since they act as disseminators of information by sharing their experience through forums, chats or the so-called "word of mouth", now supported by social networks that make it exponential [8]. A student's bad experience can take on overwhelming proportions if shared on social media.

Regarding the research questions, we can conclude that:

1. After applying the PCA, we had five dimensions according to the studies carried out by the authors [1, 2, 3]. However, the dimensions are not exactly the same. Although some of the dimensions are the same, there are differences that can be explained by the unique and specific characteristics of the HEI and by adapting the questions from the original questionnaire.

2. Dimensions do not all have the same relative importance.

3. From data analyse, it was possible to observe that the dimensions to which the respondents attributed greater importance was the "Reliability" and "Professors". These two dimensions are included as priorities in the strategic planning of ESCE – IPS. Reliability is measured and monitored through student surveys, control of the success rate in the course in terms of grades and student results. "Professors" dimension, it has been a constant commitment: the offer of pedagogical training, and in innovative pedagogical tools; support for scientific production and scientific projects, Erasmus mobility and support for participation in congresses and conferences. Collaborative work and the establishment of internal research networks were also encouraged.

The appearance of the physical equipment was the aspect valued as least important by the students. We can also observe that the values obtained for expectations were very high, which resulted in negative gaps. We can conclude that ESCE students are quite demanding, have high expectations or are very demanding in classifying perceptions, assigning them low values.

4. The dimension considered most important by the students who responded to the survey was the quality of teaching and the reputation of the institution (with 42.7%), followed by teaching capacity. The least important dimension was the appearance of the physical equipment (tangibility).

5 Final considerations

This study intended to draw attention to the problem of measuring students' expectations versus perceptions, which translates into a somewhat thankless task since the object of study is immaterial, and therefore there is an enormous subjectivity associated with this measurement.

In terms of practical implications, this study provides a structure and an application of SERVQUAL instrument that can be used by higher education institutions with a view to continuously improve educational quality [13].

Evaluating service quality level and understanding how various dimensions impact overall service quality enable educational institutions to efficiently design the service to

provide a better allocation of resources and a better service to students [7]. Higher Education Institutions should concentrate their efforts on the perceived dimensions to focus their energy on a few attributes which are more important to service quality.

According to [17], whose article sought to gather articles on measuring the quality of care in HEIs through the HEdPERF scale. They found the HEdPERF scale application in studies in Brazil, China, Croatia, India, Malaysia, Portugal, Sri Lanka and Turkey [17, 18, 19].

5.1 Limitations and future research directions

Despite the consensus regarding the relevance of service quality in HEI, it is still a challenge to identify the most adequate measurement instrument [20] that allows best understanding of prior aspects and consequences of service quality, in order to promote methods that can improve quality and achieve a competitive edge.

When measuring customer expectations in terms of service quality, all research methods have limitations and weaknesses, so mixed models (qualitative and quantitative) should be used to minimize weaknesses and identify consistent information.

In this study, the SERVQUAL instrument is used to assess student satisfaction, through the difference between their expectations and perceptions [1, 2]. It should be noted that the results may have been influenced by the Covid 19 pandemic [15], since some of the students joined ESCE when we were in distance learning carried out through different platforms (zoom, moodle and Teams). Therefore, we think that this study would have better results if it also considered these other components or if it considered only perceptions, as there are critics who argue that expectations may be related to an ideal situation, an excellent institution, which does not exist. This study especially focused on SERVQUAL scales, which is no replacement for more specific research, considering other methods that may be applied in the educational sector for evaluating service quality such us HEdPERF or SERVPERF.

The data resulting from the SERVQUAL application must be analysed in detail in order to identify deficiencies in quality and define corrective actions.

Furthermore, when an HEI intends to implement quality improvement, it can use the SERVQUAL instrument, but with some restrictions [18], so that in future research other models already identified, HEdPERF [7, 11, 17] or EFQM [8] will be used.

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Appendix 1

Questionnaire to Measure the Quality of the Services in a Higher Educations Institution (HEI) – PART A

Please, think about your concept of the ideal High School and the quality of services they provide. This questionnaire has two parts. The first part is concerned with your perceptions of Higher Education Institutions in general, while the second part is concerned with College of Business Administration (ESCE) – Polytechnic of Setúbal in particular.

Please, show the extent to which you think that HEI, in general, should possess the feature, please circle 7. If you strongly disagree that HEI should possess the feature, please circle 1. If your views are not strong circle one of the numbers in the middle. There are no right or wrong answers. All we are interest in are your expectations about Higher Education Institutions services.

1	2	3	4	5	6	7
Strongly Disagree	Disagree	Slightly Disagree	Neutral	Slightly Agree	Agree	Strongly Agree

1. Excellent HEI has modern technical equipment for the education process (i.e., computers/beamers)	
2. Physical facilities of excellent HEI are visually appealing (building and surroundings)	
3. Excellent HEI has physical facilities (parking, computers) in appropriate dimension to the number of students	
4. Teaching materials are available and up to date (study programs, brochures, student guides)	
5. Classes are held in accordance with the schedule of lectures and without delays	
6. When you have a problem, excellent HEI staff show a sincere interest in solving it	
7. The Excellent HEI takes care about the interest of the students (with the social aspects: residences, scholarships...)	
8. In Excellent HEI the plans of the courses and the programs are fulfilled in integrates	
9. The lessons given in excellent HEI are well prepared	
10. Academic staff of excellent HEI have scientific abilities to answer student's questions and doubts	
11. Academic staff of excellent HEI are always willing to help students (in classroom)	
12. Academic staff are available for consultations and are forthcoming with students	
13. Academic staff of excellent HEI have research productivity (publish books, magazine articles, doctoral thesis)	
14. Academic staff of excellent HEI have good communication skills	
15. Students of excellent HEI are informed promptly of the important dates such as: examinations, registrations, seminars	
16. Employers trust in the quality of education of excellent HEI	
17. Academic staff of excellent HEI apply pedagogic methods in their lessons	
18. In excellent HEI, the services supplied by sub-contracted companies (security, cleanliness, bar) have good quality	
19. Excellent HEI have class time and office hours convenient to all their students	
20. The compositions of academic staff influence excellent HEI reputation	
21. The reputation of the HEI influences the choice of the employers	
22. The reputation of the HEI influence student's choice	

The 5 factors that characterize service quality are listed below. We ask you to distribute 100 points for each factor, according to the weight you consider they have in measuring the quality of services.

1. Appearance of physical facilities and communication materials _____
2. HEI ability to answer to student's necessities _____
3. Skills of the academic and non-academic staff _____
4. Confidence of academic and non-academic staff _____
5. Quality of educations and prestige of the Institution _____

TOTAL OF POINTS: **100 Points**

Questionnaire to Measure the Quality of the Services in a Higher Educations Institution (HEI) – PART B

The following questions are related to your feelings about ESCE. Please choose the number of the Likert-scale, that better represents your perceptions about ESCE.

1 Strongly Disagree	2 Disagree	3 Slightly Disagree	4 Neutral	5 Slightly Agree	6 Agree	7 Strongly Agree
1. ESCE has modern technical equipment for the education process (i.e., computers/beamers)						
2. ESCE physical facilities are visually appealing (building and surroundings)						
3. ESCE has physical facilities (parking, computers) in appropriate dimension to the number of students						
4. At ESCE, teaching materials are available and up to date (study programs, brochures, student guides)						
5. At ESCE, classes are held in accordance with the schedule of lectures and without delays						
6. When you have a problem, ESCE staff show a sincere interest in solving it						
7. ESCE takes care about the interest of the students (with the social aspects: residences, scholarships...)						
8. At ESCE the plans of the courses and the programs are fulfilled in integrates						
9. The lessons given in ESCE are well prepared						
10. ESCE academic staff have scientific abilities to answer student's questions and doubts						
11. ESCE academic staff are always willing to help students (in classroom)						
12. ESCE academic staff are available for consultations and are forthcoming with students						
13. ESCE academic staff have research productivity (publish books, magazine articles, doctoral thesis)						
14. ESCE academic staff have good communication skills						
15. Students of ESCE are informed promptly of the important dates such as: examinations, registrations, seminars						
16. Employers trust in the quality of education of ESCE						
17. ESCE academic staff apply pedagogic methods in their lessons						
18. At ESCE, the services supplied by sub-contracted companies (security, cleanliness, bar) have good quality						
19. ESCE have class time and office hours convenient to all their students						
20. The compositions of academic staff influence ESCE reputation						
21. The reputation of the ESCE influences the choice of the employers						
22. The reputation of the ESCE influence students' choice						

Will you recommend ESCE to your friends and family? Yes No

Personal Information:

Course: CF GRH MKT GDL GSI
 Year: 1º 2º 3º
 Gender: Male: Female:
 Age: 20 or less 21 – 25 26 – 30 31 – 35 more than 36
 Situation: Full-time student Part-time student

Thank you for your collaboration!!!

Appendix 2

Cronbach's Coeficients to the items and dimensions

Item	Dimensions - OBLIMIN	PC Loadings	Cronbach's Reliability coefficient (when item was deleted)
RELIABILITY (0,845)			
G5	At ESCE classes are held in accordance with the schedule of lectures and without delays	0,857	0,805
G6	When you have a problem ESCE staff show a sincere interest in solving it	0,707	0,807
G7	ESCE take care about the interest of the students (with the social aspects: residences, scholarships,...)	0,75	0,814
G8	At ESCE the plans of the courses and the programs are fulfilled in integrates	0,818	0,806
G9	The lessons given at ESCE are well prepared	0,459	0,834
REPUTATION (0,790)			
G16	The employers trust in the quality of education of ESCE	0,662	0,744
G18	At ESCE, the services supplied by sub-contracted companies (security, cleanliness, bar,...) have good quality	0,726	0,734
G20	The composition of academic staff influences ESCE reputation	0,532	0,799
G21	The reputation of ESCE influences the choice of the entities employers	0,783	0,744
G22	The reputation of ESCE influences students choice	0,865	0,725
PROFESSORS (0,907)			
G10	Academic staff of ESCE have scientific abilities to answer student's questions and doubts	-0,482	0,928
G11	Academic staff of ESCE are always willing to help students (in the classroom)	-0,886	0,879
G12	Academic staff are available for consultations and are forthcoming with students	-0,8	0,879
G13	Academic staff of ESCE have research productivity (publish books, magazine articles, doctoral thesis)	-0,829	0,88
G14	Academic staff of ESCE have good communication skills	-0,826	0,0884
G17	Academic staff of ESCE apply pedagogic methods in their lessons	-0,828	0,894
TANGIBLES (0,685)			
G1	The faculty has modern technical equipment for the education process (i.e., computers/beamers)	0,482	0,694
G2	Physical facilities are visually appealing (building and surroundings)	0,665	0,606
G3	Physical facilities (parking, computers) in appropriate dimension to the number of students	0,763	0,619
G4	Teaching materials are available and up-to-date (study programs, brochures, student guides)	0,888	0,539
ATTENDANCE LEVEL (-)			
G15	ESCE students are informed promptly of the important dates such as: examinations, registrations, seminars	0,352	a
G19	ESCE has class time and office hours convenient to all their students	0,768	a