

THE QUALITY OF SERVICES IN A HIGHER EDUCATION INSTITUTION: AN EVALUATION FOR THE INTEGRATION OF AHP, SERVQUAL AND QFD METHODS¹

*QUALIDADE DOS SERVIÇOS EM INSTITUIÇÃO DE ENSINO SUPERIOR:
UMA AVALIAÇÃO PELA INTEGRAÇÃO DOS MÉTODOS AHP, SERVQUAL E QFD*

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ABSTRACT

The quality evaluation of services provided is important and essential for the generation, selection and implementation of strategies, aiming the competitive development of organizations. Profitable private companies and philanthropic institutions with social purposes need to provide qualified services in order to achieve the wanted effectiveness and good performance levels. Human Resources are reliable sources of information that allow structured assessments about the organization, the structure, and the process of services delivery. In this sense, the objective of this research was to evaluate the quality service provided in a Higher Education Institution (HEI), more specifically in the middle activity sectors, from the employee's perspective (Human Resources), using SERVQUAL scale, AHP method and Quality Function Deployment (QFD) integration. For that, a case study was carried out, using exploratory and descriptive research, with quantitative and qualitative approach. Data were collected through the use of questionnaires applied to employees from three sectors: Management (Direction and Coordination), Secretariat and Library. The AHP, SERVQUAL and QFD methods provided support for data collection and evaluation of the main quality variables. From the results obtained, the most relevant aspects for continuous improvement of services are: teaching materials, problem solving, quality and service speed, confidence, cordiality, skills domain and knowledge of students' necessities. In the construction of the quality by QFD assumption, the requirement "People" stood out with the highest degree of importance, demonstrating the relevance that human resources have in providing qualified services.

Keywords: human resources, quality function deployment, SERVQUAL.

RESUMO

A avaliação da qualidade dos serviços prestados é importante e essencial para a geração, seleção e implantação de estratégias, visando o desenvolvimento competitivo das organizações. Empresas privadas com fins lucrativos e instituições filantrópicas com fins sociais precisam fornecer serviços de qualidade para alcançar a eficácia desejada e bons níveis de desempenho. Os Recursos Humanos são fontes fidedignas de informações e permitem avaliações estruturadas sobre a organização, estrutura e processo de prestação dos

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serviços. Neste sentido, o objetivo deste trabalho foi analisar a percepção dos colaboradores de uma IES em relação à qualidade dos serviços prestados em setores estratégicos, diretamente voltados ao atendimento dos estudantes, por meio da integração dos métodos: Quality Function Deployment (QFD) e SERVQUAL. Para tanto, realizou-se um estudo de caso por meio de pesquisa exploratória e descritiva, com abordagem quantitativa e qualitativa. Foram coletados dados pela aplicação de questionários aos colaboradores de três setores: Direção/Coordenação, Secretaria e Biblioteca. Pelos resultados obtidos, destaca-se que as variáveis de maior relevância para a melhoria contínua são: os materiais didáticos, resolução de problemas, qualidade e rapidez no atendimento, confiança, cordialidade, domínio das habilidades e atividades desempenhadas e o conhecimento das necessidades dos alunos. Na construção da qualidade pelo pressuposto da QFD, o requisito "Pessoas" destacou-se com o maior grau de importância, demonstrando a relevância que os recursos humanos têm na prestação de serviços de qualidade.

Palavras-chave: recursos humanos, desdobramento da função qualidade, SERVQUAL.

INTRODUCTION

Educational organizations are important sources for knowledge development and propagation. Therefore, they demand quality services, and content veracity offered to the public of interest is indispensable. The higher education sector in Brazil, seen as a service provider, has been explored in academic studies, due to concern about the service quality offered by Higher Education Institutions (PACHECO; MESQUITA; DIAS, 2015).

Statistical Synopsis of Higher Education (2015), published by the National Institute of Educational Studies and Research Anísio Teixeira (INEP), pointed out that, in Brazil, there are 2,364 higher education institutions, divided into universities, university centers, colleges and federal institutes. This set of institutions offers about 33 thousand courses, which serve more than 8 million of enrolled students. These numbers demonstrate the greatness of the educational segment in Brazil. Consequently, HEI need to make constant improvements in order to provide quality services, reinforcing a positive image to their clients / academics and society in general, the main beneficiary of qualified education. For Oliveira and Ferreira (2009), higher education institutions need to work towards improving the quality of their services, in accordance with the expectations of their students, market and society.

In this bias, to better attend quality expectations, it is necessary that employees be committed to work in order to deliver the required service. In this sense, people are the main focus of the processes, because an effective organization is not a random point, it is before anything else fruit of human labor (MARQUES, 2011).

Accordingly, in order to the deliver improvement to clients / academics, employees must be continually developing their knowledge to deliver the services desired to the target audience. Search for commitment must be intentional, starting from critical and collective reflection on how to provide new approaches and articulation between didactic-pedagogical and institutional assumptions (MARQUESIN; PENTEADO; BAPTISTA, 2008).

Employees are people that have the purpose of developing knowledge, skills and competencies to leverage corporate results, which measures the importance of human capital in organizations (INKSON, 2008). Thus, it is relevant to examine the quality services provided from employees' point of view. Then, this evaluation is more profitable when performed using methods and instruments. In this study, the scope is the integration of three methods: SERVQUAL scale, Analytic Hierarchy Process (AHP) and Quality Function Deployment (QFD). The SERVQUAL scale is one of the most prevalent and most widely used methods for quality measurement, and it is disseminated in research and academic circles about this subject (MIGUEL; SATOLO; FERREIRA; CALARGE, 2011; SHEKARCHIZADEH; RASLI; HON-TAT, 2011).

The AHP is a method developed in the early 1970s by Dr. Thomas Saaty to support multi-criteria and problems in decision making. Besides being illustrated through a hierarchical structure, the methodology can be ideally integrated into a QFD project, used to prioritize client requirements, engineering characteristics and product alternatives (CROSTACK et al., 2007). The QFD is useful for answering questions of how to deliver quality products and services based on customer necessities, or "customer voices" (BRIAN HWRANG; TEO, 2001).

This study; therefore, was based on the problematic: what is the perception of employees in relation to service quality provided by IES? The objective of this study was to evaluate the quality of the services provided in a Higher Education Institution (HEI), more specifically in the middle activity sector, from employee's perspective (Human Resources), through the integration of SERVQUAL scale, AHP and Quality Function Deployment (QFD).

The relevance of this research is justified by the use of tools for evaluation and improvement of quality in a community institution of educational sector. Due to the sector importance, it is understood that the institutions that operate in this segment need to use techniques that reveal the quality of services offered, in order to develop the processes of analysis and decision making. For the academic community and society in general, this study contributed to disseminate knowledge regarding the use of techniques relevant to the process of evaluating the quality of services offered by non-profitable institutions, which need to attract students ("clients") and maintain the quality level.

Lastly, the study contributed to the improvement of the quality services provided in the HEI activities. Therefore, evaluation use and decision-making techniques and tools strengthen the diagnostic process on quality determinants, as well as prognosis and requirements prioritization, which need greater attention and improvement, in order to offer superior services.

THEORETICAL REFERENCES

In the theoretical reference construction, the relation between services quality and human resources was discussed. We emphasized the 4 P's of services proposed by Las Casas (2007), referring to AHP, SERVQUAL scale and QFD methods as instruments to analyze the quality of services.

HUMAN RESOURCES AND QUALITY IN HEI SERVICES

For quality services, employees are a strategic part of the processes, constituting the main factor for the work to be performed with the expected quality. Organizations perform their functions by acquiring and using resources through their employees, with a focus on developing and delivering products and services, with the objective of solving their customer's problems (MAXIMINIANO, 2010).

Therefore, human resources should be committed to deliver quality products and services, besides receiving information that allow them to understand and accept their individual and collective roles in this process, in which communication is an essential instrument to promote quality (ALMEIDA; SOUZA; MELLO, 2010).

In services provision, it is up to the employees to realize that they are providing something intangible, which requires more efforts, in order to deliver value according to the consumer expectations. These services are less tangible than goods or commodities, and their production and consumption occur simultaneously, and also, it has variable price, quality, depending on where, when and by whom they are provided (SPILLER; SANTOS; VILAR, 2009).

Services quality is more difficult to assess compared to products. In products, the consumer uses many tangible signs about quality. When acquiring services, tangible signs are limited to physical facilities and instruments used by the service provider (PARASURAMAN; ZEITHMAL; BERRY, 1985). Thus, service quality is a relevant factor when a particular service is offered, besides representing a competitive advantage for companies and a factor for nations development (PUSTIGLIONE, 2014).

Regarding higher education, Oliveira and Ferreira (2009) pointed out that developing countries have faced quality problems. This condition emphasized the need to use tools to evaluate promotion of improvements in the services offered (OLIVEIRA; FERREIRA, 2009).

Improvements in teaching quality come from processes traced to the construction of a reflective and resized institution that produces its own culture and knowledge in a collective and critical way (MARQUESIN; PENTEADO; BAPTISTA, 2008). Quality management in education is a priority issue for analysis, since studies are carried out to evaluate and measure education quality (SAHNEY; BANWE; KARUNE, 2008).

One of the most important factors for quality is the participation and commitment of all employees, since they can contribute to eliminate causes of problems, instead of only worrying about corrections of specific situations (CHERUIYOT; MARU, 2013).

In this way, with people commitment, it is feasible to deliver efficient and effective services, since there is interest of the whole organization, especially in HEI. Considering this, the 4P conditions of services proposed by Las Casas (2007), contributed significantly to the services analysis provided by institutions, especially if accompanied by prioritization and planning mechanisms, such as AHP and QFD.

According to the author, the 4P services are: Processes, Profile, People and Procedures. Processes are related to everything that is developed or performed during the services achievement. Profile is related to environment visual communication. People correspond to employees responsible for service and procedures related to activities that are performed in service provision.

In service provision analysis, SERVQUAL scale is the primary source for data analysis and acquisition, followed by AHP method, which prioritized variables through quality dimensions, simultaneously with “quality house” achievement recommended by QFD. Above, we present considerations about each tool.

SERVQUAL SCALE

The SERVQUAL scale identifies quality trends in services, through periodic surveys, aiming to evaluate satisfaction levels (FITZSIMMONS; FITZSINNONS, 2014). It is recognized as the most used scale to measure service quality (ABILI; NARENJI THANI; AFARINANDEHBIN, 2012; KOORNNEEF, 2006; SHEKARCHIZADEH; RASLI; HON-TAT, 2011). The SERVQUAL uses five quality dimensions: Tangibility, Reliability, Responsibility, Security and Empathy. Dimensions and quality determinants for each dimension are described in table 1.

Table 1 - QUALITY DETERMINANTS - SERVQUAL.

| Quality Dimenions | QUALITY DETERMINANTS/SERVQUAL |
|-------------------|-----------------------------------------------------------------|
| Tangibility | Adequate and good looking physical facilities |
| Reliability | Providing services with confidence and perfection |
| Responsibility | Sellers’ willing to assist the customers |
| Security | Safety and employees kindness |
| Empathy | Personalized service and interest in solving customers problems |

Source: Adapted from Parasuramam, Zeithaml and Berry (1988) and Fitzsimmons and Fitzsimmons (2014).

These five dimensions are used to make judgment about service quality. Analysis is based on the comparison between the expected and the perceived, making the difference between perceptions and measure of service quality, being able to be evaluated in a continuum between negative and positive. (FITZSIMMONS; FITZSIMMONS, 2014, KHORSHIDI; NIKFALAZAR; GUNAWAN, 2016, PARASURAMAN; ZEITHMAL; BERRY, 1988). Result of this measure is characterized by gaps. These gaps allowed the manager to understand the root of service quality problems and how to act to improve conditions (COELHO, 2004).

In this study, SERVQUAL scale allowed the data collection through a questionnaire adapted to the context of a Higher Education Institution, through 20 questions that are characterized later in the item Methodological Procedures. The generated data also subsidized information for analysis by the Analytic Hierarchy Process (AHP), in the sequence presented.

ANALYTIC HIERARCHY PROCESS (AHP)

The AHP method was created by the mathematician Thomas Lorie Saaty. It consists of an analytical method that seeks for a systematic approach to solve a highlighted objective (LEE; CHEN; CHANG, 2008; SAATY, 2008). According to the authors, the method allows the issues addressed in the research to be solved by organizing the hierarchy criteria for decision making. The hierarchy of analysis of the problem is developed, with the objective of breaking it down into parts (criteria, sub criteria and alternatives) (SAATY, 2008).

The Saaty scale includes nine points and their referents, and weights 3,5,7,9 represent the order of magnitude for pairwise comparison, weights 2,4,6,8 represent intermediate values and weight 1 represents importance equality. So, with these weights it becomes possible to compare pairwise criteria and sub criteria.

To analyze eigenvalue (λ_{max}) calculation, the approximation can be performed by the equation as follows: $\lambda_{max} = w * v$, w is computed by the sum of columns of the comparison matrix and the vector priority (v); Consistency index (CI) is performed by:

$$IC = \frac{|\lambda_{max} - N|}{N - 1}$$

In sequence, the analysis of the consistency of the information analyzed, through consistency ratio - RC, consistency index - IC and random index, whose equation is:

$$RC = \frac{IC}{IR}$$

Performing these calculations, it is possible to analyze the consistency of judgment, indicating if they are logically related and consistent (SAATY, 2008). For this case study, we used Saaty's summarized tables. From SERVQUAL scale and AHP analysis, it is possible to subsidize the quality planning of the Quality Function Deployment (QFD) method, in the presented sequence.

UNFOLDING METHOD OF FUNCTION QUALITY (QFD)

After the application of SERVQUAL scale and AHP method use, it is possible to extend the analysis through the integration with QFD used to design the priorities demanded by the clients.

The QFD arose in Japan after World War II, a time when people began to have more options for similar products, which offered only one function. Consumers began to demand goods that distinguished themselves by having several functions (OHFUJI; ONO; AKAO, 1997). According to the authors, QFD emerged as a methodology for product development, with the objective of meeting

customer necessities (customer requirements), based on the correlation with product requirements. Although QFD is primarily developed for planning new products, its application in projects of service delivery systems is very appropriate, since it intends to guarantee quality from project initial stages (CARNEVALLI; SASSI; MIGUEL, 2004; FITZSIMMONS; FITZSIMMONS, 2014).

Therefore, QFD has the purpose of ensuring that consumer has their needs considered from the design to the delivery of a new product or service, based on their needs and voice (AKAO; MAZUR, 2003; CORRÊA; CORRÊA, 2012). The success relies on the data collected in the customer approach (CAMGÖZ-AKDAG et al., 2013). Therefore, that it is relevant to work with the SERVQUAL, AHP and QFD scale techniques in an integrated way, since these tools or improvement methods aim to evaluate services quality provided, in order to offer subsidies to improve organizational management.

MATERIALS AND METHODS

This article described results of a case study in which three quality management tools were used to evaluate the performance of the services provided in an HEI, based on the expectation of employees (Human Resources). The research was carried out in a philanthropic Higher Education Institution, which attends from children's public education up to Post-Graduation, in four educational units located in the Northwest Region of the State of Rio Grande do Sul, extreme south of Brazil. The HEIS offers Administration, Law, Accounting, Social Work, Information Technology Management and Human Resource Management, along with other options for technical and postgraduate courses.

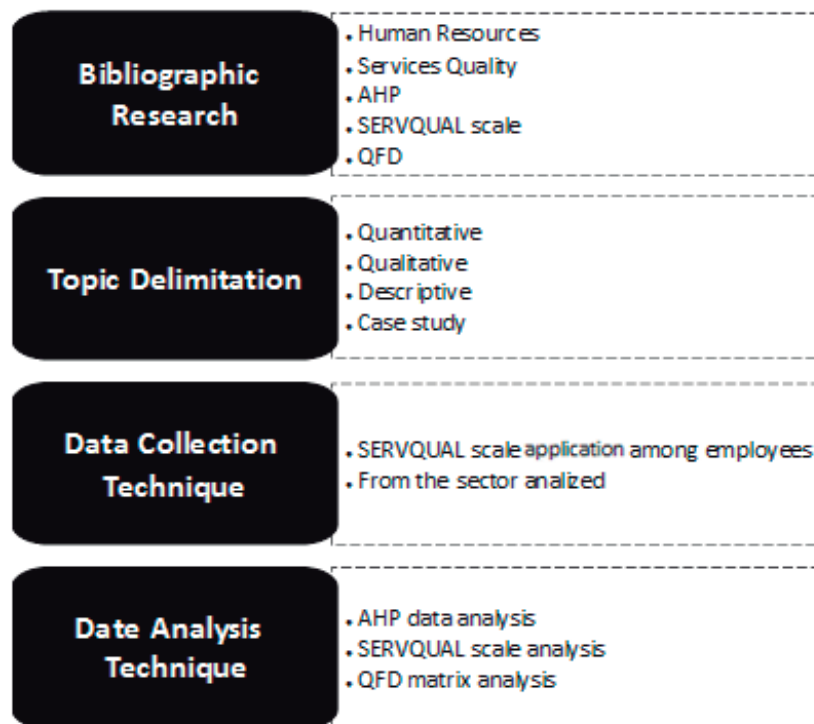
The delimitation of the research occurred during the data collected through structured interviews. Information was collected with all employees who are part of Direction and Coordination, Library and Academic Secretary departments of the IES. In this way, the results cannot be generalized.

Regarding the approach, the study is characterized by exploratory and descriptive research, because the analysis of the expectations and experience of the interviewees occur, in order to carry out a self-assessment of services they provided, through case study techniques (YIN, 2001). Combined approach occurred through understanding of quantitative data generated by the AHP method and the qualitative questions regarding the employees' perception analyzed by the SERVQUAL and QFD scale. In figure 1, study phase is exposed.

Data collection was performed through application of a questionnaire contemplating 20 questions of SERVQUAL scale, adapted to the context of HEI. Application was carried out together with Library, Secretary, Direction and Coordination sectors, considered to be medium activities that support teaching and research purposes (n = 24).

The applied questionnaire has three important functions. The first function is meeting subsidies on interviewees profiles. The second refers to the use of the SERVQUAL scale to evaluate services quality and to verify gaps between expectation and experience levels, in relation to each issue related to the five dimensions worked by the scale. Finally, the third function is to generate subsidies for applying the AHP method to prioritize dimensions, whose results are used to determine the value of Sales Argument (AV) in QFD matrix. Thus, data collection and analysis was performed through SERVQUAL scale, AHP and QFD methods integration.

Figure 1 - Phases of the methodology applied.

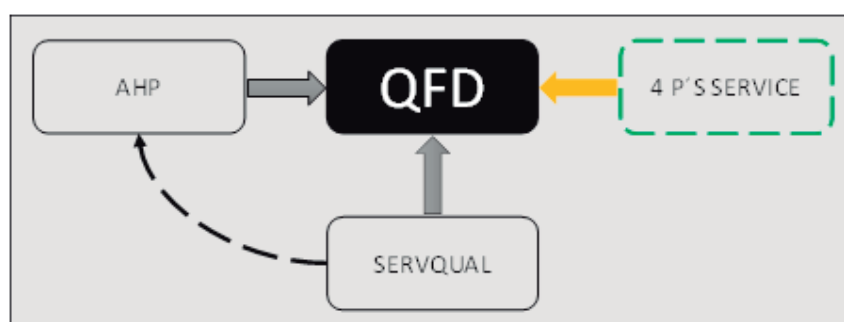


Source: Prepared by the authors.

In this research, SERVQUAL scale is the first step in data collection and analysis. Afterwards, these data are subsidies for AHP method application, which allows the prioritization of variables, whose quality level was evaluated in the previous stage. Finally, using the information generated, the matrix QFD, also known as “quality house” was elaborated. In this matrix, the aspects related to the Elements of Quality and the Required Quality are correlated. Elements of Quality were structured from the 4P’s of services: Profile, Process, Procedures and People, characterized previously. Conversely, the required quality items resulted from the SERVQUAL scale dimensions. Figure 2 represents the synthesis of the methods integration used in quality evaluation of services provided by the HEI sectors.

Hereafter, the application of each method is described, explaining its approach in the proposed research.

Figure 2 - Systematic of the methods correlation.

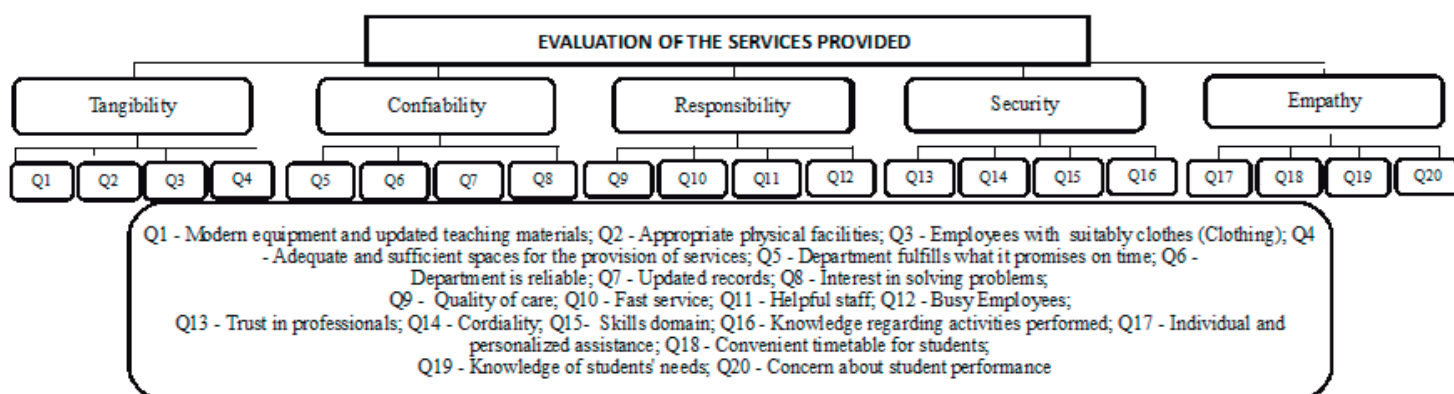


Source: Prepared by the authors.

SERVQUAL SCALE

Figure 3 illustrates the five dimensions of quality and the respective detailed questions based on the SERVQUAL scale, adapted for quality evaluation of services provided in the institution that represents the case study.

Figure 3 - Dimensions and Issues of SERVQUAL Scale.



Source: Adapted from Martinelli (2017).

Through data collection, gaps that exposed quality characteristics of services provided were identified, based on the expectation of Human Resources selected for verification. Gaps were identified according to tool assumptions, by subtracting values of “Expectation” and “Experience”. In table 2, the parameters for assessing quality levels are exposed.

Table 2 - Quality Levels.

| Value | Quality | Result |
|----------------|----------------------|-------------------------|
| Nule value | Satisfactory Quality | Expectation reached |
| Negative value | Unacceptable Quality | Expectation not reached |
| Positive value | Ideal Quality | Expectation Exceeded |

Fonte: Adapted from Fitzsimmons e Fitzsimmons (2014).

For gaps analysis, items that were most relevant to quality levels were chosen, constituting the main focus for constant improvement of the analyzed variables. Subsequent analysis of service quality description provided through the SERVQUAL scale, established priorities according to the AHP method.

ANALYTIC HIERARCHY PROCESS (AHP)

The AHP consisted of a systematic analytical method used to solve complex problems. Four stages are used in the method: problem modeling, execution, analysis and classification. In the problem modeling stage, hierarchical model was structured. This model began with quality dimension (tangibility, reliability, responsibility, safety and empathy), in, sequence the, subcriteria that were created through the SERVQUAL scale contemplating twenty variables.

The second step is execution. In this phase, the comparison matrices are developed from criteria versus subcriteria, in addition to the construction of global priority vectors. Thus, each criterion was composed of four subcriteria. From this, variables quoted according to binary combination were evaluated using the Saaty scale.

The analysis used in the study is the third step. Judgment was performed through the priority vector, through which it was possible to identify hierarchy criteria exposed and their consistency. Consistency index of matrices was 0.90, which is justified by the fact that each matrix is composed of four elements. Method extension takes up 10% consistency.

Finally, in the fourth stage, criteria and subcriteria classification takes place, through global analysis by means of ranking, in order of priority prioritization according to the employee's opinion. Later AHP analysis, the research applied the QFD method as part of the analyzes.

QUALITY FUNCTION DEPLOYMENT (QFD)

The QFD methodology allowed structuring of "house of quality" when correlating Elements of Quality with the Required Quality. Its application in services provision is very appropriate, since it seeks to guarantee quality from the Project processes initial phases and service activities (FITZSIMMONS; FITZSIMMONS, 2014).

According to Akao (1996) and Akao; Mazur (2003), when working out the "house of quality" it is necessary to establish certain parameters, which are:

a) Importance degree (GI): Established from the highest number of repetitions obtained in the evaluation of quality by SERVQUAL scale dimensions. Values were rounded to standardize the Degree of Importance according to the standards: 5 - Very Important; 4 - Important, 3 - Regular; 2 - little Important; 1 - Not important.

b) Own service (IES Now): established from the Requirement Level evaluated in the SERVQUAL scale application.

c) Improvement Plan (PM): established by the desired improvement in relation to the topics under judgment.

d) Improvement Index (IM): result of index division of current conditions of service itself and the improvement plan index.

e) Sale Argument (AV): Established according to precepts of the QFD precepts 1,5 - Strong; 1,2 - Medium; 1 - Normal. Definition of levels was based on the system of prioritization made possible by the AHP method.

f) Absolute Weight (PA): Product of the relation between Degree of Importance, Index of Improvement and Sale Argument of Sale ($PA = GI \times IM \times AV$).

Related to the three tools, data collected and the analyzes of results are presented, according to the methodology applied in the three tools: SERVQUAL scale; AHP method, and QFD.

PRESENTATION AND ANALYSIS OF RESULTS

In the presentation and analysis of the results it was possible to verify separately each method employed. The closure consisted of data integration obtained by the SERVQUAL scale and the hierarchy by the AHP method, culminating in the construction of “quality house”, according to the assumptions of the QFD methodology.

In the initial research, we tried to identify some data regarding the Human Resources profile that participated in the data collection. Half of the interviewees are male, aged between 41 and 50 years old. The most representative level of education is at Masters. According to the data collected, most agree that there is cooperation between departments, security and employment stability, in addition to feeling professional appreciation. Being secure in relation to employment is a stimulating factor for employees, since recently the Brazilian economy has been affected by several relevant macroeconomic changes, such as major changes in fiscal policy partially reversed by global financial crisis (MEURER; SANTOS; TURATTI, 2015). After knowing the interviewed public, the next question was the application of the SERVQUAL scale as follows.

ANALYSIS OF THE SERVQUAL SCALE

Through the SERVQUAL scale, it was possible to understand the professionals’ perception regarding the quality of the institution’s services. Gaps revealed the variables that presented the greatest discrepancy between expectation and experience on a 5-point scale. Quality level used for evaluation in this study was excellence, as shown in table 3.

Table 3 - Gaps analysis.

| SERVQUAL | Expectation | | Experience | | GAP | Quality Level | QUALITY |
|----------------|-------------|-------------|------------|-------------|---------|---------------|---------------------------|
| | Questions | 5 excellent | Questions | 5 excellent | E - E | Evaluated | |
| Tangibility | Q1 | 62,50% | Q1 | 37,5% | -25,00% | Excelent | Unanswered Quality |
| | Q2 | 50% | Q2 | 50% | 0,00% | Excelent | Satisfactory Quality |
| | Q3 | 50% | Q3 | 50% | 0,00% | Excelent | Satisfactory Quality |
| | Q4 | 62,50% | Q4 | 62,50% | 0,00% | Excelent | Satisfactory Quality |
| Confiability | Q5 | 75% | Q5 | 75% | 0,00% | Excelent | Satisfactory Quality |
| | Q6 | 75% | Q6 | 75% | 0,00% | Excelent | Satisfactory Quality |
| | Q7 | 62,50% | Q7 | 62,50% | 0,00% | Excelent | Satisfactory Quality |
| | Q8 | 62,50% | Q8 | 87,50% | 25,00% | Excelent | Ideal Quality |
| Responsability | Q9 | 87,50% | Q9 | 62,50% | -25,00% | Excelent | Unanswered Quality |
| | Q10 | 75% | Q10 | 62,50% | -12,50% | Excelent | Unanswered Quality |
| | Q11 | 87,50% | Q11 | 87,50% | 0,00% | Excelent | Satisfactory Quality |
| | Q12 | 62,50% | Q12 | 62,50% | 0,00% | Excelent | Satisfactory Quality |
| Security | Q13 | 87,50% | Q13 | 100% | 12,50% | Excelent | Ideal Quality |
| | Q14 | 75% | Q14 | 87,50% | 12,50% | Excelent | Ideal Quality |
| | Q15 | 50% | Q15 | 62,50% | 12,50% | Excelent | Ideal Quality |
| | Q16 | 75% | Q16 | 62,50% | -12,50% | Excelent | Unanswered Quality |
| Empathy | Q17 | 62,50% | Q17 | 62,50% | 0,00% | Excelent | Satisfactory Quality |
| | Q18 | 75% | Q18 | 75% | 0,00% | Excelent | Satisfactory Quality |
| | Q19 | 75,00% | Q19 | 62,50% | -12,50% | Excelent | Unanswered Quality |
| | Q20 | 75% | Q20 | 75% | 0,00% | Excelent | Satisfactory Quality |

Source: Data research.

Based on gaps presented through quality levels chosen because they provided greater discrepancy, it is noticed that all dimensions presented variables that can be analyzed. At the Excellence level, they stood out negatively (gaps with critical priority), that is, the expectations were not met, Q1 (Tangibility), which referred to modern equipment and updated materials (gap -25%); Q9 (Responsibility), referring to service quality (gap -25%); Q10 (Responsibility), fast service (gap -12.50%); Q16 (Safety), related to the knowledge regarding the activities performed (gap-12.50%) and Q19 (Empathy), students' knowledge.

Conversely, those that stood out positively, that is, expectations were exceeded in levels of excellence at: Q8 (Reliability), interest in solving problems (gap 25%); Q13 (Safety), confidence in professionals (gap 12.50%); Q14, (Safety), cordiality of employees (gap 12.50%); Q15 (Safety), skills domain (gap 12,50). Variables that did not present a gap had the quality met, that is, the expectations were equated with the experience. Gaps selected in Excellence level, both with positive and negative results, served as support in the construction of the QFD methodology or "the quality house", as shown in Figure 4. From the use of the SERVQUAL scale it was possible to design the analysis for the AHP method, in order to prioritize the variables of greater relevance. It is described above.

ANALYSIS OF THE AHP METHOD

Through the AHP method it was possible to understand the judgment of the employees regarding quality dimensions and their respective variables in the researched sectors. Table 4 presents the hierarchical model of the AHP method and the respective results contemplating all steps mentioned in the methodology.

Table 4 - AHP COMPUTATION.

| Criteria | Overall Weight | Subcriteria | Local Weight | Overall Weight | Ranking |
|----------------------------------------|----------------|--------------|----------------|----------------|----------|
| CR₁ - Tangibility | 0,23583 | Scr1 | 0,07887 | 0,0185999 | 14 |
| | | Scr2 | 0,20089 | 0,0473759 | 6,5 |
| | | Scr3 | 0,20089 | 0,0473759 | 6,5 |
| | | Scr4 | 0,51935 | 0,1224783 | 2 |
| CR₂ - Confiability | 0,0868 | Scr5 | 0,21042 | 0,0182645 | 15,5 |
| | | Scr6 | 0,21042 | 0,0182645 | 15,5 |
| | | Scr7 | 0,09792 | 0,0084995 | 17 |
| | | Scr8 | 0,48125 | 0,0417725 | 10 |
| CR₃ - Responsibility | 0,04257 | Scr9 | 0,125 | 0,0053213 | 4,5 |
| | | Scr10 | 0,125 | 0,0053213 | 4,5 |
| | | Scr11 | 0,625 | 0,0266063 | 11 |
| | | Scr12 | 0,125 | 0,0053213 | 19 |
| CR₄ - Security | 0,48253 | Scr13 | 0,555 | 0,2678042 | 1 |
| | | Scr14 | 0,25165 | 0,1214287 | 3 |
| | | Scr15 | 0,0967 | 0,0466607 | 8,5 |
| | | Scr16 | 0,0967 | 0,0466607 | 8,5 |
| CR₅ - Empathy | 0,15227 | Scr17 | 0,125 | 0,0190338 | 12,5 |
| | | Scr18 | 0,375 | 0,0571013 | 19 |
| | | Scr19 | 0,125 | 0,0190338 | 12,5 |
| | | Scr20 | 0,375 | 0,0571013 | 19 |

Source:Research data.

In view of the data presented, it can be seen that the most important dimension is Security (0.48253). Thus, it is understood that it is linked to the set of measures that are adopted by employees, seeking to minimize errors during the process. According to Gronross (2009), employees need to pass trust and leave customers safe. Starting from this concept, it is noticed that the employees of this institution understand that with trust, services tend to be developed more efficiently. The Scr4 (0.51935) was highlighted in the Tangibility dimension, this variable refers to the space where the services are performed being adequate and sufficient. This idea contributed to ergonomic theory, because the more the work environment is favorable, the better is the employee’s performance.

In the Reliability dimension, Scr8 (0,48125) was identified as the most important, which refers to the department having interest in solving the problems. Entrepreneurship only gives significant results when customer satisfaction occurs. Thus, when the educational institution faces problems

from students, it is necessary to find viable alternatives in order to satisfy them. In view of the aforementioned results, employees are aware of this, which favors the company in competitive terms.

In the Responsibility dimension, employees emphasized Scr11 (0.6250) which refers to employees being helpful. When employees are pleasant and helpful, interaction between those involved tends to be enjoyable. The Security dimension pointed to Scr13 (0.5550), which depicts confidence in the professionals. When employees are carrying out activities with confidence, goals established are being fulfilled. Empathy dimension highlighted Scr20 (0.37500), that referred to the concern with student performance, which is a determinant factor to contribute to organization competitiveness focused on educational services.

The overall weight highlighted Scr13 (0.2678042) as confidence in the professionals as being the most prioritized. From this, employees of this institution have concern and interest in showing confidence in solving student’s/clients problems. This factor contributed to the organization performance in relation to the services performed. In table 5, it is possible to observe the consistency index of the matrices presented for pairwise evaluation proof.

Table 5 - Consistency index.

| Criteria | Criteria Consistency index | Subcriteria | Subcriteria Consistency index |
|-----------------------|------------------------------------------------------------------|-------------|-------------------------------|
| CR1 Tangibility | λ MAX = 5,32813 CI = 0,0820325 CR = 0,07324 | Scr1 | λ MAX = 4,04358 |
| | | Scr2 | CI = 0,014526 |
| | | Scr3 | CR = 0,0161 |
| | | Scr4 | |
| CR 2 Confiability | | Scr5 | λ MAX= 4,15537 |
| | | Scr6 | CI = 0,05179 |
| | | Scr7 | CR = 0,05754 |
| | | Scr8 | |
| CR3 Responsibility | | Scr9 | λ MAX = 4,00000 |
| | | Scr10 | CI = 0,00000 |
| | | Scr11 | CR = 0,00000 |
| | | Scr12 | |
| CR4 Security | | Scr13 | λ MAX= 4,04350 |
| | | Scr14 | CI = 0,0145 |
| | | Scr15 | CR = 0,01611 |
| | | Scr16 | |
| CR5 Empathy | | Scr17 | λ MAX= 3,99999 |
| | | Scr18 | CI = 0,00003 |
| | | Scr19 | CR = 0,00000 |
| | | Scr20 | |

Source: Research data.

According to Satty (2008), the CR of comparison matrix must be less than or equal to 0.10. From this, it can be seen that criteria and subcriteria judgment are within the established parameters, showing that the judgment are consistent, as seen in the literature. Therefore, after judgment made by the AHP method, the QFD method for quality analysis revealed by the interviewees was applied.

CONSTRUCTION OF THE “HOUSE OF QUALITY” BY THE QFD METHOD

From the SERVQUAL and AHP data, the QFD method was set up and integrated according to the assumptions of Akao (1996); Ohfuji, Ono and Akao (1997); Brian Hwang and Teo (2001); Akao and Mazur (2003); and Crostack et al (2007).

In the vertical axis of the matrix, aspects of Required Quality are placed, which represent the requirements of the users. In order to do so, the SERVQUAL scale analysis dimensions was used, specifically the subcriteria that presented gaps and received excellent score in quality level evaluation, according to the methodology. Already in the horizontal success of the matrix, Elements of Quality are related, which corresponded to the criteria that must be considered to guarantee services quality. For that, the 4P’s of services (Process, Profile, People and Procedure) were considered, in accordance with Las Casas (2007).

Following the methodology assumptions, we defined the correlation between the items listed in the vertical and horizontal axis, in order to define the nexus between them. It was applied: (5) for strong correlation; (3) existing correlation; and (1) for possible correlation. Correlations are represented by the symbology described in the legend of the “quality house” shown in figure IV / 4.

Sales arguments were established according to the prioritization of the dimensions generated by the application of AHP method. The higher the priority, the greater the weight, with values of 1.5, 1.2 and 1.0 being assigned, as shown in table 6.

Table 6 - Priorities.

| QUALITY DIMENSION | PRIORITY OBTAINED BY AHP METHOD | SALE ARGUMENT - QFD |
|-------------------|---------------------------------|---------------------|
| Responsability | 0,04257 | 1 |
| Confiability | 0,0868 | 1 |
| Empathy | 0,15227 | 1,2 |
| Tangibiliy | 0,23583 | 1,2 |
| Security | 0,48253 | 1,5 |

Source: authors formulation.

In the Quality Planning stage, the degree of importance was attributed to the results obtained in the application of quality assessment questionnaire. For rounding purposes, the indexes with the highest number of replications among the respondents were considered.

Data indicated that Security is the most important requirement from the point of view of the institution’s employees, since it presented the highest average of 0.48253, followed by the tangible aspects, 0.23583. Third is the empathy with index 0.15227 and subsequently, reliability, with 0.0868. Finally, comes responsibility, with 0.04257. These data were used to define the Sales Arguments Index of the items listed as Quality Requirement in the QFD matrix. That said, Safety is admitted as of high impact, obtaining greater weight (5). The importance order is reducing according to the evaluation that each item listed had.

In the analysis of correlations, it is perceived that the Tangibility has a strong correlation with Profile. Q1 that established the link between these two items, makes clear that modern equipment and teaching materials influenced the organization and visual communication of the working environment, providing comfort and well-being for those involved with the service provided.

Regarding Reliability, Q8 expressed an interest in solving problems. Therefore, this item had a correlation with Processes and People, and a strong correlation with Procedures. That is, the processes point to the organization and functioning of sectors in order to carry out the activities related to the required service. People are responsible for the interlocution and execution of processes. However, the strongest connection is with procedures, as they are related to activities performed to deliver the requested service.

In Security dimension, the focus is on perception and ability to respond to the needs of service seekers. The analysis of questions Q9 and Q10 put the quality of care and prompt service under judgment. Both issues also presented correlation with Process and People, and strong correlation with Procedures, presenting the same conditions of Reliability dimension.

In relation to Security dimension, four points are under judgment: trust (13) and cordiality (Q14) of professionals; skills domain (Q15); and knowledge regarding the activities performed (Q16). Q13 expresses correlation with processes and strong correlation with people. Q14 also showed strong correlation with people and Q15 had a correlation with Procedures and People and a strong correlation with Processes. And finally, in Q16 we identified correlation with Procedures and strong correlation with People. In general, Security is intrinsically linked to People, since in all items under evaluation this Quality Element was present. In empathy dimension, (Q19) there was a strong relation with Processes, since the knowledge of reality / needs of the students is determinant for the quality of the service process. The matrix points out that Human Resources have a greater degree of importance to meet the quality demanded in the provision of services of HEI. This condition is highlighted by the existence of correlation and / or strong correlation between quality and all items of Quality requirement. In the calculation of relative importance, People reached 40.63%, which made eminent the need for cohesive strategies and projects for Human Resources development, favoring quality services and; consequently, generating good levels of competitiveness of the institution in the Market.

In the evaluation of the Planned Quality, it is observed that questions Q1, Q13, Q14, Q16 and Q19 obtained greater relative weight. Issues of (IES now) that were below the Degree of Importance (GI) and the ones that established strong (1,5) and reasonable (1,2) selling points influenced the results, obtaining the greatest weight. In this way, the greater the weight, the greater the degree of importance. It is observed that the other questions that attended the degree of importance when compared to the HEI, having weak sale argument and obtaining the lowest score.

This research was based on the evaluation of the quality of services in a HEI, based on methodologies integration. Database for the analysis was compiled from the information generated by the Human

Resources participation of the institution in which the research was developed. These are absolutely relevant variables to conduct any organizational work, since, according to Silva and Ruas (2016), organizational processes and performance are built through collective actions carried out by people and consolidated through cooperative relations and interaction. In these study, People (HR) are singled out as the main Quality Element for promoting quality services in HEI. It is by people that all activities of an organization are managed and operationalized. Even with the help of modern technologies, without the human element acting as activity drivers, you get nowhere.

Processes present themselves as the second most important dimension, precisely because they are responsible for structure, organization and operationalization of service delivery activities. Physical environment, with a less relevant degree, has strategic importance for all other variables to be executed. In short, people dominate the space they occupy to carry out their processes, completing a procedure in a physical environment that allows certain activities to be performed with the utmost perfection.

CONCLUSIONS

The objective of this study was to evaluate the quality of the services provided in a Higher Education Institution (HEI), more specifically in the sectors that perform middle activities, from the perspective of the Human Resources that carry out their research in these places. The evaluation was performed through SERVQUAL scale, AHP and QFD integration.

The first data collected pointed to the belief that everyone works in a healthy environment, prone to growth and with security and guarantee of employability. It became explicit the feeling of “belonging”, to the organization so that all grow together.

In the first stage of the study, the application of the SERVQUAL scale pointed to gaps, which required improvement actions. Data indicated that the main gaps are in items Q1 (modern and upgraded equipment and materials), Q9 (quality of service), Q10 (Fast service), Q16 (Knowledge in relation to activities performed) and Q19 (Knowledge of student needs). According to the evaluation of the interviewees, these variables presented negative gaps, that is, quality is not reported. In contrast, ideal quality; ie, aspects in which the experience exceeded expectations, were items Q8 (Interest in solving problems), Q13 (Trust in professionals), Q14 (Cordiality) and Q15 (Skills domain), which represents good quality levels and are strengths to be explored.

In the application of the AHP methodology, data indicated that the Safety dimension received the highest overall weight index, placing it in the most relevant position. In integrating the methodologies, the information extracted in the AHP was used to determine the sales argument (AV), used in the QFD matrix as the aspect that will determine the items that require more attention in the planning of quality services.

The quality matrix, structured by the QFD method, exposed the correlation between the gaps pointed out by the SERVQUAL Scale and the 4P's of the services recommended by Las Casas (2007).

The structured data pointed out that People is the most important Quality Element, followed by Processes and Procedures, both directly influenced by the work developed by Human Resources. Regarding Quality Requirement, the items Safety, Tangibility and Empathy are the aspects that require more attention, considering the results compiled in the calculation of Planned Quality. However, the set of information generated in this research, focused on the Human Resources perspective, presented strategic elements that contributed to the development of service quality. This points to human capital relevance and to the importance of generating solutions based on the interpretation of who is at the forefront of providing services: people.

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