

# Study Of The Requirements That Students Seek In Universities, Using The QFD Tool

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**Abstract—Knowing what factors students look for when choosing a university has become very important for the university itself; having these factors helps to improve and increase the number of students who ingress. The present study was prepared for the average of universities in the southern region of the state of Guanajuato, Mexico, which integrates the “Quality Function Deployment” (QFD) tool. This is applied to students who are about to enter universities. When applying the QFD tool, the requirements that students look for when choosing a university are analyzed, such as diversity of majors, scholarships, infrastructure, academic demands, schedules, among others, obtaining as a result which are the most relevant factors that the student choose and how they are related to what universities offer.**

## I. INTRODUCTION

It is important to know the requirements of the students to evaluate and improve what the Universities offer in order to increase the number of students who enter, to achieve this there are different methods that provide significant information to increase the quality of services, among these, we have the tool Quality Function Deployment (QFD), which is an important product development method, dedicated to converting customer requirements into activities to develop products and services [1]. It is a bridge between the customer and the product (process/service). The QFD technique translates customer needs, obtained from market research on measurable products using matrix diagrams and the teamwork for development products [2]. Competitive pressure and declining income in higher education have prompted many universities to increase the number of students admitted as a means of increasing their income.

If Universities wants to increase the number of students entering, they must begin to satisfy the students' requirements and know the factors that help to solve this problem. Based on this problem, the present work aims to provide the reader with how the QFD tool was used to know the most relevant factors that lead the student to prefer and choose a university.

## II. STATE OF THE ART REVIEW

There are different related jobs that seek satisfy the needs of students.

In article “Factors affecting students” [3] the students as client are examined. This study explores the factors influencing students' towards accepting the concept of student as client and their intentions to study, in universities that adopt this concept. The document provides guidance for universities to prepare for adopting the concept associated with the number of students intending to study at their universities.

In another investigation, Finne et al. [4] presents one of the first studies to empirically examine students as customers and their perceptions. The authors collected data through surveys of 1,025 university students.

In [5] the higher education of Palestinian students from Israel studying at Jordanian Universities is analyzed. Six Jordanian universities were studied, each of which responded to a questionnaire indicating the factors that led them to search for and select Universities in Jordan. Similarly, there are different investigations that demonstrate the successful application of QFD tool in service -oriented companies. In [6] QFD methodology was implemented to identify improvement strategies in services offered by an academic library. This study identified readers' needs through questionnaires assessed their significance and tested levels of satisfaction. Consequently, a set of service improvement techniques was proposed to satisfy the reader's needs.

In [7] the use of a QFD-Kano combination is proposed as a valuable tool for evaluate service quality. A digital library of a university located in Mexico is presented as a case study. Data to support the QFD-Kano model were obtained through an online questionnaire that was made available to users via the library's website. In [8] a QFD is performed as a service environment to provide an innovative approach to risk management within a university institution.

In [9] a QFD-based approach is proposed to support the design of products and services. In [10] the QFD method is used in environmental management.

The application of this method allows to select activities that are crucial for ecological requirements that lead to the improvement of quality of life of citizens. In [11] QFD method is used to prioritize customer needs.

It is important to highlight that the research presented provides an overview of the relevance of understanding the requirements in the student sector to satisfy their needs. Furthermore, the applications of QFD tool in service companies are explored. This state-of-the-art review aims to broaden the perspective, suggesting the viability of using QFD not only in the service sector, but also in the educational field. It is evident that understanding student requirements is crucial to implementing significant improvements in education, making QFD a valuable contribution for optimization of educational processes.

### III. METHODOLOGY

Fig. 1 presents a diagram that details the steps that were carried out to obtain the QFD applied to high school and newly admitted university students.

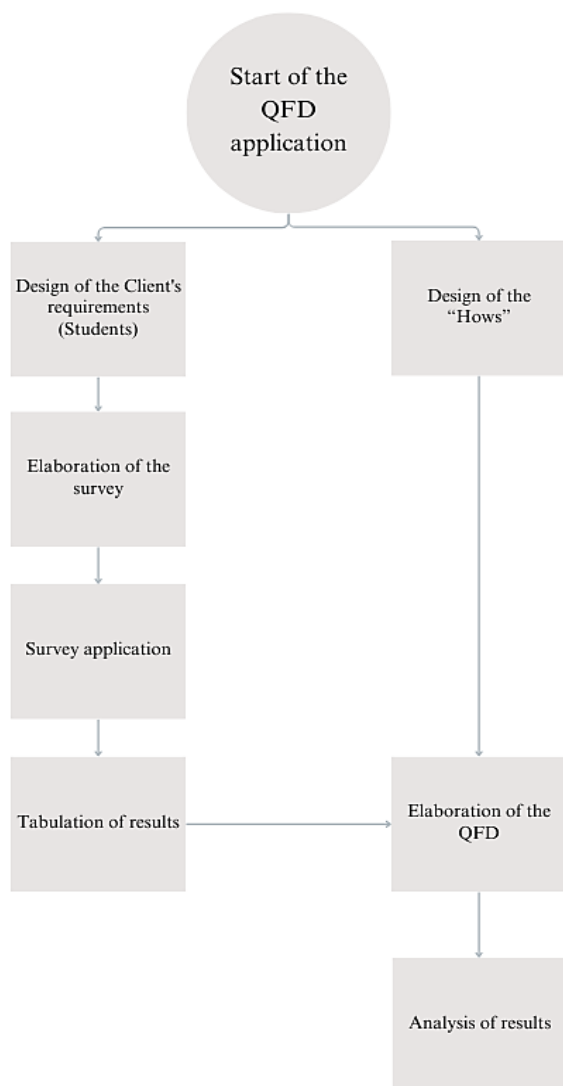


Fig. 1. QFD Methodology

#### A. Star of the QFD application

According to the success of QFD applications in different sectors of the companies, the QFD tool is selected since it adapts to the research objective. For this reason, we seek to know the requirements of the students so that the universities improve and increase their enrollment.

#### B. Design of the Client's requirements(Students)

At this point, the WHAT'S were proposed, that is, the requirements that students expect to obtain from universities.

Students were surveyed to find out what their most important requirements are from the following list:

- Doctor Templates
- Diversity of careers
- Costs
- Scholarships
- Industrial Visits
- Infrastructure
- Social Activities
- Environment
- Location
- Academic Requirement
- Schedules
- Transportation

#### C. Design of the "Hows"

In this step, the requirements (HOW'S) that the university can offer to students were raised, which are:

- Doctor Staff
- Scholarships and support
- Prestige
- Industrial Visits
- Infrastructure
- Cultural and social events
- International exchanges
- Food service
- Psychological care
- Security
- Nursing and nutrition service
- Transportation

*D. Elaboration of the survey*

To prioritize the client's requirements (WHATs), a survey was developed to obtain the opinions of the students. The evaluation included 12 questions each being rated on a scale from 1 to 5. This weighting made it possible to evaluate the importance of each aspect, assigning a value of 1 for "not at all important" and 5 for "very important".

The survey consisted of the following questions:

- 1.- How important is the diversity of academic programs in a university to you?
- 2.- How significant are the costs associated with attending university for you?
- 3.- How important is it for you that the university offers scholarships?
- 4.- How important do you consider the university's infrastructure (classrooms, equipped spaces, laboratories, sports facilities)?
- 5.- How relevant do you find the social activities that a university provides?
- 6.- How important is it for you that the university offers transportation services?
- 7.- How important is the location of the university to you?
- 8.- Is it important to you that the university has a qualified faculty of professors?
- 9.- How important is the academic rigor in a university for you?
- 10.- How important is it for you that the university organizes industrial visits?
- 11.- How important is it for you that the university provides convenient class schedules?
- 12.- How important is the university environment to you?

With the application of these 12 questions, the most relevant aspects for the student were identified. These results were analyzed within the QFD using the correlation coefficient.

*E. Survey application*

89 surveys were applied to high school students and 71 to newly admitted students from universities in the southern region of the state of Guanajuato, Mexico.

*F. Tabulation of results*

Once the surveys were completed, the results were tabulated to obtain the correlation coefficient, which is obtained by multiplying the results of the surveys with their importance weighting.

*G. Elaboration of the QFD*

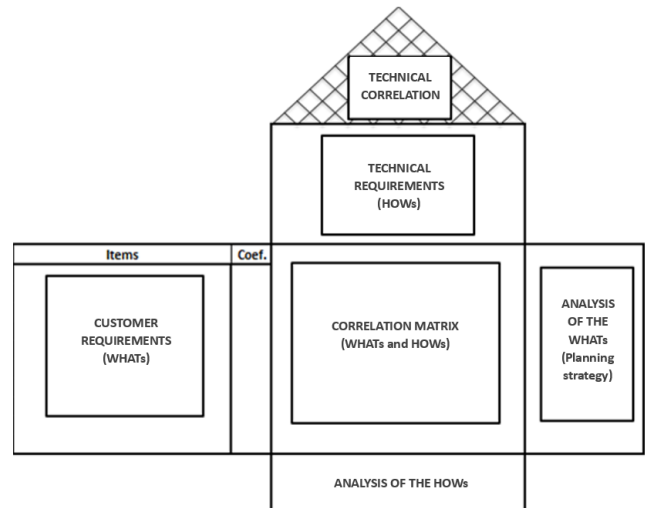


Fig. 2. QFD structure

Student Requirements (WHATs): Importance of student requirements.

Technical requirements offered by universities (HOWs): Proposed requirements offered at the Universities in the southern region of the state of Guanajuato, Mexico.

Correlation Matrix: In this section, a weight is given to the correlation between the WHATs and the HOWs. The weighting was as follows:

- Correlation 1: Poor
- Correlation 3: Weak
- Correlation 5: Average
- Correlation 7: Strong
- Correlation 9: Very Strong

Correlation Coefficient: This coefficient indicates the factor that is of utmost importance for students.

Analysis of the WHATs: This analysis is obtained with the results in the correlation matrix, which are the sum of the weighting value between the WHATs and the HOWs of each factor by its correlation coefficient. The strongest factor offered by universities and the aspects in which improvement must be made are shown by this analysis.

Analysis of the HOWs: Here the strongest value of the technical requirements is obtained based on the correlation matrix.

Technical correlation: The possible relationships between the HOWs, whether positive or negative, are depicted in this triangular matrix.

H. Analysis of results

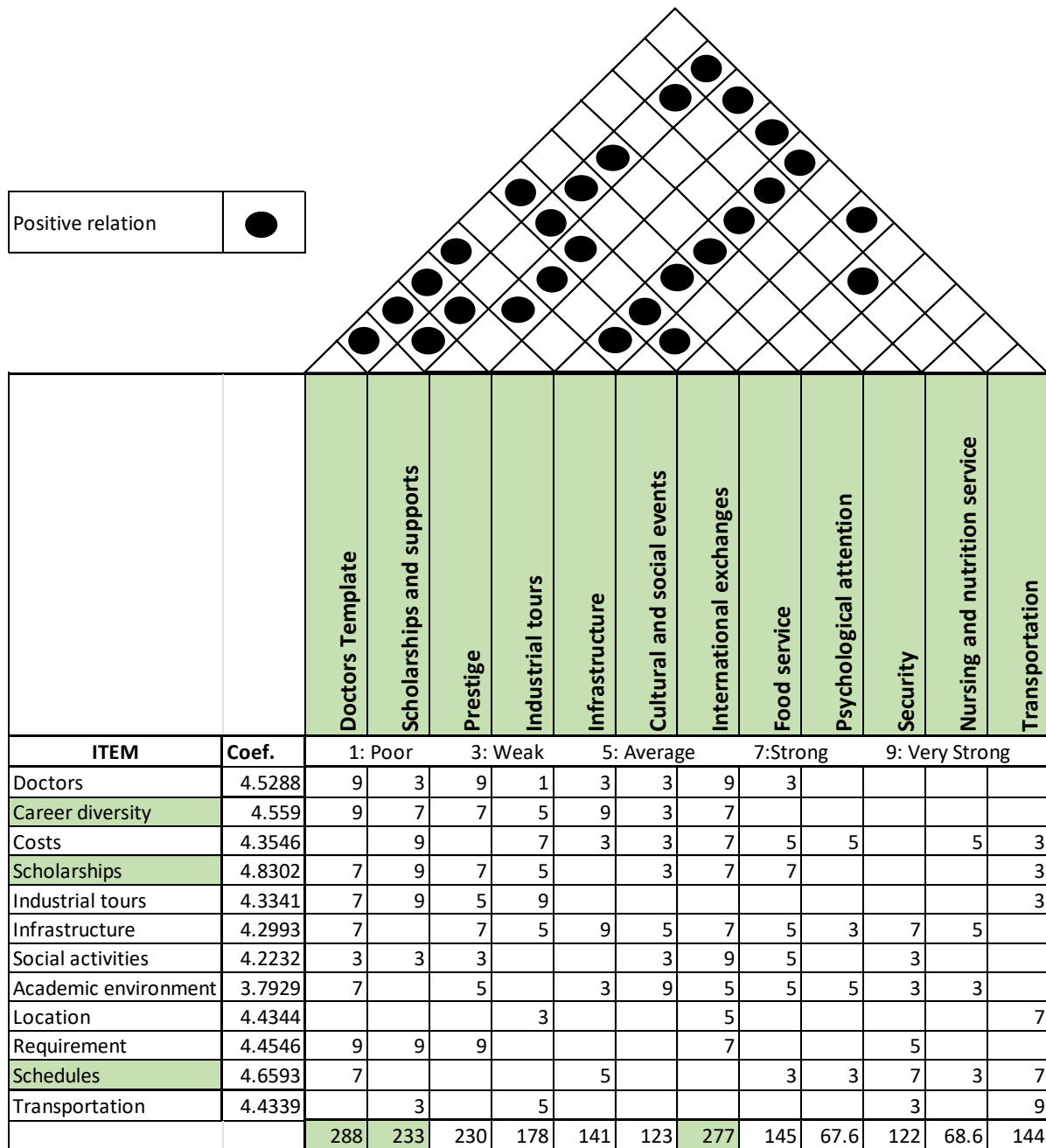


Fig. 3. Results of QFD

Fig. 2 shows the results obtained in the QFD; their description is detailed in the following section. A) Importance of customer requirements

QFD starts with customers' needs and wants, which are called customer requirements. This research used surveys to identify students' key requirements when selecting a university.

The 3 results classified in order of importance that were obtained for students from public and private institutions were:

Scholarships worth 4.83

Schedules with 4.66

Race diversity with 4.56

Based on the results provided by surveys on the key requirements of students when choosing a university, we can make several inferences:

Importance of Scholarships:

The high score (4.83) assigned to scholarships indicates that students consider this aspect as crucial when selecting a university. It should be noted that

much of students surveyed are part of middle or low-income families, so there is a significant demand for financing or scholarship opportunities, and that the availability of financial support can be a determining factor for many students.

#### Schedule Assessment:

The high score (4.66) assigned to schedules suggests that students attach great importance to schedule flexibility. This could indicate that students are looking for academic programs that fit their schedules or that allow them to balance their studies with other responsibilities.

Although slightly lower compared to scholarships and schedules, career diversity is a significant factor with a score of 4.56. This suggests that students value the availability of a wide range of academic options when choosing a university.

In summary, these results indicate that, according to the perceptions of the students surveyed, scholarships, flexible schedules, and career diversity are key aspects when evaluating and selecting a university. These findings can be useful for the university in adapting its strategies to attract students, for example improving scholarship offers, flexibility of schedules, and diversity of academic programs.

#### B) Priorities for technical requirements (how's).

At this stage the importance and relative weight of the service characteristics are determined using the values and the relationship matrix developed in the relationship between the WHAT and the HOW. This calculation process combines customer requirements with service characteristics, so the resulting value provides the relative weight of each service characteristic compared to customer requirements.

According to the weightings shown in this section, the 3 results classified in order of importance were:

- °Doctors template with a value of 288
- °International exchanges with a value of 277
- °Scholarships and support worth 233

According to these results, the following is inferred:

#### Importance of the Doctor Staff:

The characteristic "Doctor Staff" has been assigned with the highest value (288), indicating that, according to the calculation made, this is the most important or priority technical characteristic. This could suggest that the presence and quality of the faculty, especially the doctors, is a crucial aspect to meet the technical requirements of the service, in addition, a vast staff of doctors implies a greater diversity of careers and more opportunities to obtain scholarships and support. which is related to the essential requirements that students choose.

#### Relevance of International Exchanges:

The characteristic "International Exchanges" continues in importance with a value of 277. This suggests that, in terms of meeting technical requirements, universities participating in international exchange programs is considered highly valuable by those involved in the study.

#### Evaluation of Scholarships and Support:

The characteristic "Scholarships and support" with a significant value of 233 implies that, according to the results, financial support and scholarship opportunities are considered as technical factors relevant to the service.

#### Relevance of International Exchanges:

The characteristic "International Exchanges" is the second in importance with a value of 277. This suggests that, in terms of meeting technical requirements, universities participating in international exchange programs is considered highly valuable by those involved in the study. Once again, this is related to the most important requirements that students choose, since international exchanges generate a greater diversity of careers, in addition to the fact that these exchanges have great support and scholarships.

#### Valuation of Scholarships and Support:

The characteristic "Scholarships and support" with a significant value of 233 implies that financial support and scholarship opportunities are considered as relevant technical factors for the service, especially among students who are part of middle-income and low-income families.

In summary, these weightings suggest that, from the perspective of meeting technical requirements, the quality of the PhD template, the availability of international exchanges and financial support through scholarships are key aspects. These findings can guide the institution in improving and developing these specific areas to meet the identified expectations and technical needs.

#### C) Technical correlation of the HOWs.

In this step, managers are expected to determine the degree of functional relationship for each pair of service characteristics. Most importantly, this correlation matrix provides a system thinking perspective. If a decision is made to improve one aspect of the service, then it must be evaluated how that change will impact other areas whether the impact is negative or degrading. As seen in Fig. 3, in this section we can find only positive correlations, so any design and improvement concept does not affect the other variables that the universities provide.

#### IV. CONCLUSIONS

The main contribution of this document lies in the design and implementation of a Plan for the Universities based on the QFD methodology. The fundamental objective of this plan is to view the



student as a potential client, with the purpose of increasing the number of enrollments.

By adapting strategies based on QFD results, institutions can not only attract more students but also improve the quality and relevance of their higher education.

Some of the strategies that this research proposes are:

**Scholarships and Support:** Financial support options should be expanded, scholarship opportunities clearly communicated, and student assistance programs strengthened. Specific scholarships and financial support can be provided for less common careers or areas where increasing diversity is sought. Strategic partnerships can also be established with companies and foundations that can contribute financially to scholarship programs. In addition to continually seeking government funding opportunities for scholarships and providing training to students to participate in these programs.

**Schedules:** Explore options for flexible schedules, offer classes at different times of the day.

**Career Diversity:** Expand the variety of academic programs. As a strategy, you can investigate the academic offerings of other educational institutions to identify gaps or areas where the university could differentiate itself. Likewise, track graduates to understand what fields they have found employment in and what skills have been crucial to their success. Another important aspect may be to examine global and technological trends to anticipate the skills and knowledge that could be important in the future.

Implementing these strategies will not only promote continued innovation, but can also ensure the creation of a strong, student-oriented educational environment. This comprehensive approach can not only improve the quality of education, but could also result in an increase in enrollment, allowing universities to successfully achieve their institutional goals.

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