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## Formulation of a quality policy and quality objectives at a Latin American university

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### Abstract

“Quality” is something that concerns everyone who purchases a product or makes use of a service from an institution. There is no difference in the field of higher education. “Quality” higher education is a service which demand is constantly growing. One of the paths to achieve quality within a higher education institution is the generation of a Quality Policy and Quality Objectives. This work shows the entire process that the Salesian Polytechnic University has executed in order to obtain the instruments that are necessary to effectively generate its Quality Policy and Quality Objectives, through the use of the Quality Function Deployment (QFD) methodology. It has been concluded that the methodology we have applied has allowed us to clearly identify the needs that the clients require to satisfy most recurrently, as well as the institutional characteristics and the processes that must be improved and created.

Keywords: Quality policy; quality objectives; QFD; UPS.

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## 1. Introduction

The term “quality” is often related to any enterprise, organization or institution that provides a service or offers a product. Assessment of the product or service is established by its user or the client, generally according to the level of satisfaction that he or she feels after his or her needs have been satisfied. This assessment can be, in many cases, subjective, since it may depend on several factors. However, satisfaction of the client to the greatest possible degree is of interest to the enterprise.

For an educational institution, one key objective is the recognition of its “quality” by the community in the fields of teaching, research, engagement with society and administrative management. Therefore, the need to have instruments to attain this recognition is understandable. The Salesian Polytechnic University of Ecuador (UPS) portrays the importance of the existence of a Quality Policy and Quality Objectives in its official planning documents: UPS Strategic Plan, Navigation Chart 2014-2018, and Annual Operational Plan 2017. In this manner, a process that allows those who lead the institution to generate the bases of ‘quality’, responding to the needs expressed by the users of the different services and that are adapted to their reality, has been executed.

The methodology used to achieve the objective has been the Quality Function Deployment or QFD, as proposed by Akao, which translates the client’s requirements into technical requisites (Akao, 2004). According to Kahraman, Ertay and Buyukozkan (2006) QFD is a set of planning tools oriented towards the satisfaction of the client. QFD allows for the formulation of a Quality Policy and Quality Objectives, since it considers the needs of the client and helps maximize the quality and value of the services of the institution through the identification of key and support strategic processes, which are represented by the Process Map and the Quality Map. This methodology offers a tangible method to manage the development of new services and their improvement (Akao, 1997).

Chan and Wu (2002), from the related literature review, manifest that education as a field of service has experienced more than once the benefits of QFD in the processes of planning, research, distance education, program design, among others. Based on this, UPS confidently applied this deployment in order to know its needs, as voiced by its clients. There are several previous experiences applying QFD in the educational field; a very relevant one was developed by Sangeeta-Sahney, Banwet and Kraunes (2004), who used it to identify the set of minimal characteristics of design/quality components that fulfill the students’ requirements as clients of the educational system in an institution from India. Other experience is the one by Brian Hwarng and Teo, (2001) who claim they have demonstrated how a higher education institution can apply the QFD methodology based on three phases to translate the voices of clients in stages into operational requirements. Finally, one of the experiences that most closely resembles the case of UPS is that which was studied by Pitman, Motwani, Kumar and Cheng, (1995) who illustrate how QFD can be utilized to measure the client’s satisfaction in educational institutions, for which they used QFD in the making of the MBA program in Grand Valley State University.

This work portrays the development of each of the phases that the process entails, as well as the analysis of the results that have been obtained in each phase. It has been concluded that the QFD methodology allows for the identification of the needs of the users of each service of the institution, expressed by themselves, which although represents a longer process of tabulation and information processing, provides an opportunity for UPS strategic planning and potential to focus on boosting what is really valuable to its clients.

## 2. Description of the Process

The Quality Policy and Quality Objectives of the Salesian Polytechnic University of Ecuador will be formulated with basis on the implementation of QFD. This methodology allows for clients to get involved in the processes of product development (Pesantez, 2011), which in this case involves every field in which UPS offers services to the community. QFD can be defined as a practice to design processes that respond to the needs of the clients (Uselac, 1993), which means that it will help UPS to produce what its clients have expressed to be their needs. Then, if the institution has as a goal for society to identify it because of its “quality”, it is not illogical to think of an strategy that allows it to consult its clients about

their requirements, and, based on that, improve its processes in order to satisfy them as much as possible. QFD is a practice that leads to improvements in the processes so that an organization can surpass the client's expectations (Goetsch & Davis, 2005).

The applied methodology has entailed the following phases:

- Identification of the services that UPS offers.
- Identification of the users or actors of the services that UPS offers.
- Definition of a survey which was applied to the identified users or actors.
- Analysis of gathered responses.
- Generation of the matrix: Clients vs. Needs.
- Generation of the matrix: Needs vs. Institutional Characteristics that satisfy them.
- Generation of the matrix: Institutional Characteristics vs. Processes.
- Quality Plan Generation.
- Process Map Layout.
- Quality Policy and Objective Formulation.

### **2.1. Identification of the services that UPS offers**

In order to define the services that UPS offers to the community, we have resorted to its official institutional documents. In the UPS statute, as approved by its Superior Council on April 15, 2015, Article 1 states: *"...The Salesian Polytechnic University is a higher education institution, with a Christian inspiration and of a Catholic and Salesian nature, ...; which promotes the development of the person and the cultural and educational heritage of society, through teaching, research, engagement with society, university administrative management and the diverse services that are offered to the local, national and international community..."*

It is then identified that the Salesian Polytechnic University entails the following functions:

- Teaching
- Research
- Engagement with society
- University Administrative Management

### **2.2. Identification of the users or actors of the services that UPS offers**

Once the services that UPS offers to the community have been properly identified, it is necessary to identify the groups of people that use them. It must be noted that a user is not necessarily someone who pays an economic value in exchange for a service (for instance, a student), because the different departments of UPS interact with themselves in a dynamic manner, due to the fact that each of them has specific functions and attributions, so it is customary for an "A" instance to require the service of a "B" instance. Therefore, it is necessary to assess the level of satisfaction that is experienced by the person who works at "instance A" about the service provided by "instance B", as well as eliciting his or her opinion regarding the aspects that might be improved. In his manner, the users that have been identified and of which we have registered their opinions are classified in the following groups:

- UPS authorities
- Teaching staff
- Administrative staff

- Research staff
- Students
- Graduates
- Students’ parents
- Enterprises with which UPS keeps pre-professional practices arrangements
- Local authorities

The strategy that was used to gather the opinions of each actor was the application of a survey that the informants were able to access via internet. Each user must have a direct relation with one or more of the services that UPS offers. In table 1, the way in which these relations have been defined can be observed.

**Table 1. Relation between UPS users and services**

Users	Teaching	Research	Engagement with Society	Administrative Management
UPS authorities	x	x	x	x
Teaching staff	x			
Administrative staff		x		
Research staff				x
Students	x			x
Graduates	x			x
Students’ parents			x	x
Pre-professional practices - Enterprises			x	
Local authorities		x	x	

### **2.3. Definition of the survey that was applied to the identified users or actors**

For each of the four services that UPS offers, a survey made up of two questions has been created. The surveys have been checked and approved by UPS relevant instances, the teaching Vice-principal and the Academic General Vice-principal. The questions that were included in each survey are shown below:

Teaching:

- Mention at least five aspects UPS should have in order for its Teaching services to be recognized by their high academic quality. (For example: 1. Specialized professors, 2...)
- Mention five needs that as a user/actor of the Teaching services of UPS you need to satisfy.

Research:

- Mention at least five aspects UPS should have in order for its Research services to be recognized by their high academic quality. (For example: 1. Prestigious researchers, 2...)
- Mention five needs that as a user/actor of the Research services of UPS you need to satisfy.

Engagement with Society:

- Mention at least five aspects UPS should have in order for its Engagement with Society services to be recognized by their high academic quality. (For example: 1. Agreements with successful enterprises, 2...)
- Mention five needs that as a user/actor of the Engagement with Society services of UPS you need to satisfy.

Administrative Management:

- Mention at least five aspects UPS should have in order for its Administrative Management services to be recognized by their high academic quality. (For example: 1. Timely service, 2...)
- Mention five needs that as a user/actor of the Administrative services of UPS you need to satisfy.

#### 2.4. Analysis of the obtained responses

This turned out to be longest phase because the questions were completely open, so the informants were able to express their opinions freely. Therefore, it was not possible to use a tool that calculates statistical data or responses summaries automatically, so this tabulation and subsequent analysis was done manually. 6016 people were asked to answer the survey, and they were segmented as shown in Table 2.

**Table 2. Informants Segmentation**

Informant	Amount
UPS authorities	54
Teaching staff	940
Administrative staff	432
Research staff	188
Students	51
College graduates (bachelors)	3254
Graduates from masters or PhDs	130
Students' parents	200
Pre-professional practices - Enterprises	653
Local authorities	114
Total	6016

According to Table 3, responses from 488 informants were received, all of which were tabulated.

**Table 3. Received Responses**

Informants	Amount
UPS authorities	18
Teaching staff	199
Administrative staff	48
Research staff	58
Students	23
Graduates	51
Students' parents	72
Pre-professional practices - Enterprises	19
Local authorities	-
Total	488

#### 2.5. Generation of the matrix: Clients vs. Clients' needs

Out of all the responses that were received, the needs expressed by each one of the clients have been extracted. It is understood that if the current user of the service expresses this need, it is because he or she finds a deficiency when making use of the service. Then, these are the needs that according to the QFD methodology must be satisfied by improving or modifying the processes, and it would help minimize the amount of needs expressed by the users. From this analysis, 51 needs were elicited, and the matrix "clients vs. needs" was generated; an extract of this matrix is shown in table 4.

In table 4, the value of the column "Perception of the actors" has been calculated based on the percentage of user groups that to some capacity expressed the corresponding need, therefore, the needs that are considered basic in the perception of quality at UPS ARE:

- Physical and Technological Infrastructure
- Specialized teaching staff

- Allocation of research hours
- Human quality
- Good treatment of people

**Table 4. Matrix: Clients vs. Clients' needs (extract)**

Need	Authorities	Teaching staff	Research staff	Administrative staff	Enterprises	Students	Students' parents	Graduates	Perception of the actors
Specialized teaching staff	x	x	x		x	x	x		75,00%
High impact publications	x	x	x			x			50,00%
Scholarships for students		x	x			x	x	x	62,50%
Bibliographic resources	x	x	x	x		x			62,50%
Bilingual professors (English)	x	x	x						35,50%
Allocation of research hours	x	x	x	x	x	x			75,00%
Human quality	x	x	x	x		x	x		75,00%
Physical and technological infrastructure	x	x	x	x		x	x	x	87,50%
Good work environment	x	x		x					37,50%
Good treatment of people	x	x		x		x	x	x	75,00%

**2.6. Generation of the matrix: Clients' needs vs. Institutional characteristics that satisfy them**

Every need expressed by the users of the services must be taken care of by an institutional characteristic. It is possible that these characteristics have to be modified, innovated or even created. For each need, the institutional UPS characteristic that should satisfy it has been identified.

The level of importance of the characteristics has been calculated based on the amount of needs related to the same characteristic. A summary of the characteristics that contribute the most to the perception of "quality" at UPS is shown in table 5.

**2.7. Generation of the Matrix: Institutional characteristics vs. Processes**

Each one of the institutional characteristics that satisfy the clients' needs must exist within the frame of an institutional process. During the last two years, UPS has produced about 40 academic processes that satisfy the needs of the teaching field, and is currently producing approximately 25 more processes, always taking into account the current regulations, both external and internal. However, not every need expressed by the clients is related solely to teaching; therefore, it has been necessary to approach every instance responsible for the corresponding field to consult about the process that frames the institutional characteristic and the way in which it is executed. Thus, the matrix "Institutional Characteristics vs. Processes" has been generated, and its summary is shown in Table 6. The characteristics are related to the regulations and activities that are recurrent within the institution. The level of importance of each process has been calculated based on the amount of characteristics that are related to the process.

**Table 5. Summary of the matrix "Clients' needs vs. Institutional characteristics" (extract)**

Institutional characteristic	Percentage of the needs it supports
Education with human and academic quality	27,7%
Training of staff with courses and seminars	25,5%
Incentives to scientific production a UPS	19,1%
Academic offering and distributives	19,1%
Major projects / Programs	14,9%
UPS Teaching staff formation plan	14,9%
Scientific Dissemination	14,9%

**Table 6. Summary of the matrix “Institutional Characteristics vs. Processes” (extract)**

Process	Percentage of the characteristics it frames
UPS teaching staff formation	18,2%
Granting of incentives for scientific production at UPS	18,2%
Undergraduate projects / Graduate programs	15,2%
Teaching staff updating	15,2%
Execution of courses or seminars for the staff (Permanent formation)	15,2%
Acquisition of bibliography	15,2%

### **2.8. Generation of the Quality Plan**

The matrix of Institutional Characteristics vs. Process is an input for the generation of the Quality Plan. This plans allows for the identification of the key elements for the management of each of the processes (Pesantez, 2011). An extract of the Quality plan is represented on Table 7, in which the following columns are present:

- Process: It corresponds to the name of the process.
- Responsible: Department of UPS that is in charge of executing the process.
- Entries: Activities with which a process is started; they can also be the exits of other processes.
- Exits: The result that is expected of a process; they can become the entries of other processes.
- Client: Beneficiary of the process exit.
- Indicators: Quantifiable data with which the efficiency of a process can be measured.

### **2.9. Layout of the Process Map**

From each Quality Plan a Process Map can be obtained. In this map, the strategic, support and key processes are identified. The Process Map represents the logical relation between the processes, the reach of each of them and the way in which they entries and exits are related (Pesantez, 2011). The Process Map is shown in Figure 1.

### **2.10. Quality Policy and Quality Objective Formulation**

The definition of a Quality Policy, according to the Spanish norm UNE- EN ISO 9000, states: “Global intentions and orientation of an organization, related to the quality as formally expressed by the high direction” (Pesantez, 2011). Improvement of the quality of UPS is based on all the detailed work, however, in order to formulate its Quality Policy, the needs expressed by the clients will be used once again, which have been grouped in “families” according to their field. This grouping is shown in Table 8.

Quality objectives, according to norm UNE- EN ISO 9000, are defined as “something ambitious or sought for, related to quality” (Pesantez, 2011). UPS Quality Objectives will be based on the Quality Policy, and again, in order to establish them, the needs expressed by the client will be used, and whether or not they are measurable will be defined, as well as their level of importance based on the percentage of users groups that expressed it. This can be appreciated in Table 9.

**Table 7. Summary of the Matrix “Quality Plan” (extract)**

Process	Responsible	Entries	Exits	Client	Indicators
UPS Teaching staff formation	.Area Direction .Academic Coordination of headquarters .Knowledge Degree Major Direction	Academic formation of teaching staff	Qualified teaching staff	Academic staff	% of academic staff in correspondence to their academic profile
Granting of economic incentives for scientific production	.Research Vice-chancellor .Headquarters Vice-rectory	Publications	Granting of economic incentive	Researchers	Amount of publications by author and by research group
Degree Major Projects / Graduate Program Projects	.Teaching staff Vice-chancellor .Knowledge Area Direction	Guidelines and necessities the project will satisfy	Academic project	Commission	% of Approval of the Project by CES
Teaching staff Update	Academic Coordination of headquarters	Results of teaching staff assessment	Teaching staff training	.Students .Academic peers .Teaching staff	Results of teaching staff assessment
Permanent Training	Technical secretariat of Engagement with society	Requirement of training of the staff	Development of the seminar or course	.Academic staff .Administrative staff	Amount of courses or seminars executed annually
Bibliographic resources	Headquarters Library committee	Requirement of bibliography acquisition	Purchase of bibliography	.Academic staff	% of served requirements

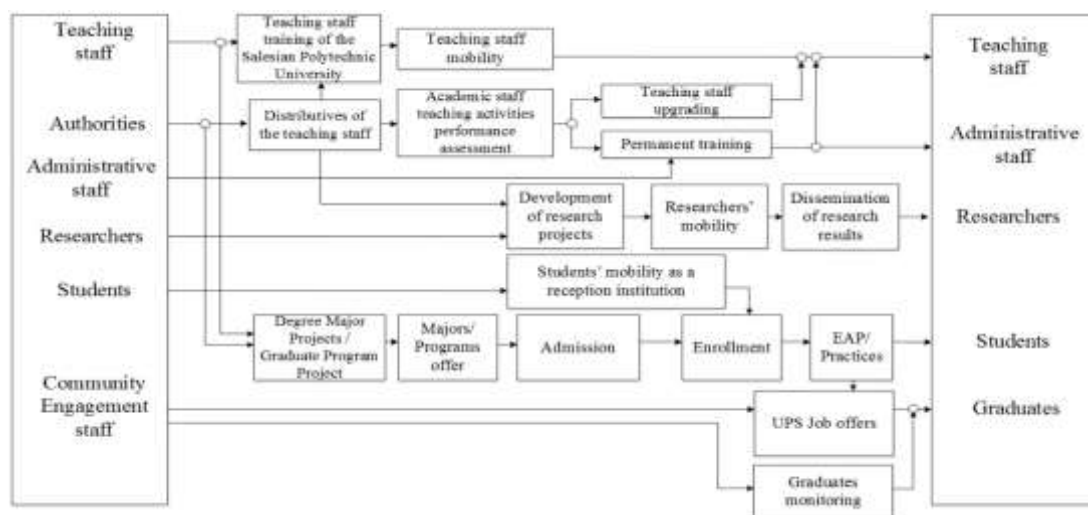
**Table 8. Grouping of needs by families**



Synthesis by family	Amount of needs
Academic Quality Teaching	9
Research	10
Academic Offer	8
Salesianity, Equity and Access	4
Physical and Technological Infrastructure	3
Student Mobility	1
Certifications	1
Academic Processes	1
Engagement with society	3
Availability, Good Service, Work Environment	10
Needs to be considered	51

**Table 9. Characteristics of the needs expressed by the clients**

Need	Measurable Condition	Importance	Identifying number of the family to which it belongs
Specialized teaching staff	x	2	1
High impact publications	x	4	2
Scholarships for students	x	3	6
Bibliographic resources	x	3	2
Bilingual professors (English)	x	5	1
Allocation of hours for research	x	2	2
Human quality	x	2	4
Physical and technological infrastructure	x	1	5
Good work environment	x	5	10
Good treatment to people	x	2	10



**Figure 1. Process Map**

### 3. Conclusions

The applied methodology has allowed those who lead UPS to obtain a wide vision of the aspects that their clients consider necessary and listen from their own voices the expectations they have when they

use the services that UPS provides. The needs expressed by the clients have allowed the discovery of the flaws the institution presents that, in some cases, were unknown. Identification of the needs of the users determines institutional characteristics that must be corrected or adopted, which in time gives UPS the opportunity to organize its resources to improve the processes that have the greatest deficiencies, and boost those that have greater importance. All the information that has been generated will, in a short term, allow UPS to formulate its Quality Policy and Quality Objectives in a more efficient way, which will be useful, so that later on it can elaborate its strategic planning to precisely identify the aspects that must be improved, and advance towards its goal of offering “quality” services.

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