

MEASUREMENT AND EFFECTS OF TEACHING QUALITY: AN EMPIRICAL MODEL APPLIED TO MASTERS PROGRAMS¹

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Abstract

This study applies service quality and customer satisfaction theory to the field of education, and particularly to postgraduate studies. It examines the impact of multiple indicators of teaching quality on student satisfaction. For this purpose, a model is proposed and verified in which the teaching quality indicators are antecedents of the student's satisfaction with the professor and the program. An innovative aspect of the study is the introduction into education of the concept of customer loyalty as a result of satisfaction.

In its analysis of these aspects, the study draws on data from a survey conducted among students of two business administration programs. A total of 2,446 valid questionnaires were obtained.

In the proposed model, the latent variable, student satisfaction, is considered to be a consequence of the combined effect of satisfaction with certain aspects of teaching quality and the cause of the variation in the indicators on the satisfaction measurement scale. The model was tested by using the MIMIC [Multiple Indicators and Multiple Causes] structural equation technique.

Key Words: Quality in Education, Student Satisfaction, Master in Business Administration, Service Quality, Loyalty

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The attention and preoccupation being devoted to the measurement and evaluation of the quality of postgraduate programs, particularly of Masters programs, and of the student's satisfaction with these programs, is a relatively recent phenomenon. The development experienced, both in those Masters of a generic nature—such as MBA programs—and in programs of a more specialized nature, when added to the increase in the supply of such programs on the market, makes the evaluation of their quality a matter of growing importance.

Masters programs must meet the needs of both the students who demand them and of the companies that demand their graduates. Education and training are services provided to the student, who in turn provides them to companies. Therefore, the success of a program will depend to a great extent on its market orientation and on the opinion of and the degree of satisfaction experienced by the student. Research done in the marketing field, especially on quality of service and customer satisfaction, are highly useful in this context.

The main contribution made by the research reported on in this paper is the proposal of an integrating model on the determinants and effects of student satisfaction in which the student (or customer) loyalty variable is included. From the increasingly accepted stance that views the student as a co-producer of the service he receives (Dill, 1995; Guolla, 1999), variables involving his degree of dedication and interest are introduced into the model.

The work we describe in this paper has the following objectives:

1. to measure and analyze the factors that determine satisfaction of students in Masters programs;
2. to propose and verify an explicative model of the antecedents and consequences of student satisfaction with postgraduate programs;

3. to include in that model variables reflecting the student's participation as a co-producer of the service.

The data come from surveys conducted from the beginnings of Masters programs developed by the Department of Business Administration of a Spanish university. Information was gathered from more than 3,000 answered questionnaires on all the subjects taught and by professor. The attributes studied were teaching quality, overall satisfaction, the student's interest in the subject and the student's loyalty and dedication.

THE MARKET ORIENTATION OF THE EDUCATIONAL SECTOR

There is a current trend whose point of departure is the idea that students and their potential employers can be treated as market segments whose expectations educators strive to know and meet satisfactorily (Anderson, Summey and Summey, 1991; Kotler and Fox, 1997; (Colbert, Levary and Shaner, 2000).

While the existence of differences and peculiarities is recognized between the way customers are served in industry or in the consumer market and the orientation required for the university studies market in general, and for postgraduate studies in particular, the main fundamentals and instruments of marketing are valid and applicable, as we will see further on. There are research studies that prove the applicability of factor analysis techniques for analyzing the motivations of university students (Juric, Todo and Henry, 1997); of the cluster analysis to analyze student profiles (Stafford, 1994); for multidimensional scales for evaluating performance in a faculty (Herche and Swenson, 1991); the use of conjoint analysis to design the course offering (Dubas and Strong, 1993); analyses of repositioning of universities and of their Masters programs (Goldgehn and Kane, 1997; Comm and LaBay, 1996).

Recent developments in relational marketing and market orientation (MO) models are highly useful for measuring the quality of teaching in general and, by extension, in postgraduate programs. This is shown in the research done by Dubas, Ghani, Davis and Strong (1998) and by Siu and Wilson (1998). The latter two researchers propose and empirically verify the validity of an MO model adapted to the specific characteristics of the educational field. Taking the model put forward by Narver and Slater (1990), Siu and Wilson develop an MO model whose outstanding components include customer orientation.

The application of this model obliges us to define, within the educational framework of postgraduate teaching, who the customer is. Guolla (1999) finds that there are at least four roles that students can assume: i) as *consumers*, if the students perceive that their program / service is one of high value, they will recommend it or will try to support it if they are satisfied; ii) as *customers*, students have their own needs, and therefore, expect to receive significant added value in their training so that, when they complete the program, they will experience an improvement in their intellectual development; iii) as *producers*, as opposed to mere passive receivers of the knowledge conveyed by the professor, graduate students have an active function: they learn, seek new knowledge. Finally, there is the role of student as iv) *product*—particularly in postgraduate business administration programs; in this role, students aim not only to prepare themselves for the sake of their personal development, but also to become a good "product" for the labor market. Thus, students assume roles as customers and consumers; therefore, their satisfaction with the educational service / product is a result of the exchange relationship between educators and students. This is the point where marketing concepts involving satisfaction sought by customers are applicable to education.

According to Lewis and Smith (1994), considering the student as customer would imply that

"professors are relegated to the role of mere employers." These authors include professors as one of the components of the group of internal customers who can be a key factor for quality in education together with students, programs and departments.

According to the *European Foundation for Quality Management* [EFQM] 1995, the following client groups can be distinguished in university education: i) the corporate world of potential employers; ii) families, who contribute financial resources and demand security and information on the student's progress; iii) prospective students, who need information on which to base their choice; iv) alumni, who may require additional training and updating of their knowledge; and v) society as a whole, which needs a competent labor force and free, educated citizens.

Therefore, it can be seen that, when considering the student-customer, there are diametrically opposed positions. Ritzer's mercantilist approach (1996) stands at one extreme. This author holds that the student is comparable to any buyer who demands a good service, quality courses at low prices. Higher education thus becomes a mere consumer product. The position held by Barret (1996) is at the opposite extreme. Barret maintains that the final objective of education is never to satisfy the student-customer, since the person assuming this role does not know how to specify his or her needs, especially at the beginning of the degree course. We understand that, for students in Masters degree programs, this viewpoint cannot be taken into account. The great majority of students who consider training of this type come to the selection process with a strong educational background.

Most of the positions are in an intermediate area where the student is seen as a singular customer, an active participant in the process of his or her education. For example, it is believed that considerable progress can be made in the achievement of high quality in

university education by identifying a double student profile: (a) as a customer of support services—libraries, computing centers, etc., (b) as a co-producer of the academic program who is responsible for his or her own learning. In this context, the use of the term *customer* is increasingly accepted and, above all, of the notion of co-producer (Dill, 1995), all of which involves the need to restate the bases of the student-professor relationship and move forward toward the establishment of concepts and techniques that will tend to improve the quality of educational programs.

QUALITY IN UNIVERSITY EDUCATION

The interest in quality in university education is not new. Peña (1997, 1998) points out that, as early as 1967, this subject was tackled at the "International Conference on the World Education Crisis." In recent years, as a reflection of the growing importance of quality in the corporate world and in academic research, the application of their concepts and methods has been extended to the public sector and to university education. Experimental programs to foment quality in university teaching are being advocated in the European Union, and in Spain the Ministry of Education and Science has promoted a program that is now in effect. According to Peña, these initiatives are based on the hypothesis that the perspective and methods of quality improvement in the business world are applicable to university teaching.

Having defined, in the previous section, the concept of the student as customer, we must consider the concept of product / service in university education, whose quality we aim to measure. According to the EFQM (1995, p. 5), the product is defined in terms of value added to the student's knowledge, skills and personal development. As in the corporation, the quality of the product is linked to the quality of the process, so in teaching, the quality of the product entails analyzing the quality of the educational processes and identifying the elements

to which special attention must be paid. Barnett (1992) proposes an integrative model of the key factors that influence the quality of the university student's learning and educational process; among these factors, the quality of the faculty is especially important.

Quality of Service Models Applied to Teaching

Because the work of the teacher consists of the delivery of a service, there is a growing trend that considers graduate teaching as a special case of customer service for which the theoretical fundamentals of service quality and MO are valid (Fernández and Mateo, 1992; Giacobbe and Segal, 1994; Stafford, 1994; Athiyaman, 1997; Coates and Koerner, 1996, Joseph and Joseph, 1997, 1998; Bigné, Moliner and Sánchez, 1998; Browne, Kaldenberg, Browne and Brown, 1998; Dubas *et al.*, 1998; Lawton and Lundsten, 1998).

Applying this perspective, Giacobbe and Segal adapted the model for evaluating service quality put forward by Parasuraman, Zeithaml and Berry (1985) to the case of teaching business management and administration at the university level. To the original model that presented the relationship between two parties—the service provider and the service demander—Giacobbe and Segal added a third participant: the labor market, or potential employers who will evaluate the final product: knowledge (Wambsganss and Kennett, 1995).

The model they propose can be extended to other groups—society, its institutions—that also receive the services provided by the university.

Along the same lines, Colbert, Levary and Shaner (2000) measure and compare the efficiency of MBA programs by considering three outputs: the degree of student satisfaction, the degree of employer satisfaction and an index that jointly measures both levels of satisfaction.

There is no doubt that teachers are highly interested in knowing the quality perceived and managers' satisfaction with the training of university graduates, among other reasons, because these perceptions from the market influence the students' demand of educational services and society as a whole. Other approaches to the perception of quality in teaching are set out by Plank and Chiagouris (1997), who have studied the determining factors of perceived quality by counselors and advisors to students, while Joseph and Joseph (1997) have researched university employees' perception of the quality of their institutions.

Without forgetting the significance of the perceptions of quality of these other groups, it seems of central importance to know students' perceptions of quality, since they are the immediate or direct customers.

Relationship between Quality of Teaching and Student Satisfaction

Satisfaction and quality of service are two closely related concepts that have attracted the attention of many researchers. Despite this, no unanimous agreement has been reached regarding the sense of the relationship between the two concepts. While Parasuraman, *et al.*, (1994), Cronin and Taylor (1992) and Taylor and Cronin (1994) hold that the perception of quality of service is a determinant of satisfaction, Bolton and Drew (1991) and Bitner (1990) find that satisfaction antecedes the quality perceived.

When dealing with the perception of the quality of the service called teaching, Athiyaman (1997) asserts that perceived quality is a result of the student's satisfaction with the courses received. This author considers that perceived quality is the attitude that reflects the degree to which the student's expectations at the beginning of the degree course are met, or not met. These expectations and the student's satisfaction refer to the different features of the service,

such as the emphasis on improving teaching, the availability of professors for consultations, library services, computing facilities, recreational facilities, size of classes, degree of difficulty of the course contents, and workload, among others. The author's empirical results also indicate that the quality perceived by the students has a strong impact on the communication of graduates with third parties, such as recommending the program to potential students. These results coincide with those found by Martin and Bray (1997) for the specific case of MBA programs.

Browne *et al.* (1998) and Guolla (1999) maintain that the perceived quality of the offering and university educational services explains the differences in the levels of student satisfaction. Browne *et al.* (1998) use the SERVQUAL scale and various measures of satisfaction to study empirically the relationship between perceived quality and university students' satisfaction. In the opinion of Guolla (1999), satisfaction is a highly appropriate variable for measuring the quality of teaching, above all when the student is observed in his role as customer. According to this author, this variable offers such significant aspects as: i) the relative lack of ambiguity of the term *satisfaction* inasmuch as students can be considered expert consumers, since they have already had the experience of taking university courses, ii) satisfaction reflects a reciprocal relationship between student and professor. Therefore, although there may be other means as important as satisfaction to measure teaching quality, the view of the student-customer enables the instructor to analyze how to improve his or her teaching.

We can thus observe that the different positions with regard to the causal relationship between perceived quality and satisfaction, which we have mentioned above, are reflected in the research applied to degree studies.

Student satisfaction is generally measured by means of periodic surveys. While surveys, as an

instrument for evaluating teaching, have given rise to some controversy, a recent study shows that 98% of the universities and 99% of the business schools in the United States use them systematically (Simpson and Sigauw, 2000). These authors have detected certain weaknesses perceived by professors in the surveys and identified different practices developed by professors to influence these evaluations.

Therefore, it is important to have and use complementary evaluative instruments. Such authors as Murphy (1999) propose an outside observer's opinion as a method for evaluation. The institutions that use this method delegate the task of making unannounced observation visits to classes to another professor at the same level.

Despite the criticism leveled at the survey system, its usefulness as a measuring tool is widely recognized (Grennald, 1997, Mckeachi, 1997, Cashin and Downey 1992, Younker and Sterner, 1988, Guolla, 1999), and a review of the most widely used questionnaires can be found in Guolla, 1999.

Finally, it is worth pointing out that, while the study of customer loyalty occupies a central place in the literature on satisfaction and quality of services, no studies have been found that include this concept applied to education. Loyalty in this field can be approached from the behavioral point of view, by focusing on the existence of a pattern of repeated registration in diverse programs of a same institution. Or from the attitudinal standpoint, which considers the intention of continuing the relationship with the teaching institution and the professor, the strengthening of the link and the feeling of belonging to a group of graduates, as well as the intention of recommending the program to third parties (Oliver, 1999; Parasuraman, *et al.*, 1985; Dick and Basu, 1994).

PROPOSED METHODS AND HYPOTHESES

Based on the literature reviewed (Athiyaman,1997; Guolla, 2000; Browne *et al.*, 1998), two models are proposed. The first only considers those aspects of teaching quality that the professor can control. The second model includes quality indicators associated with the student as co-producer of the teaching service.

Model 1

The hypotheses underlying this model are the following:

H1: The professor-controllable quality indicators determine the Satisfaction achieved by the student after completing the course.

H2: The Satisfaction variable is reflected by two indicators: Satisfaction with the professor and Satisfaction with the Program.

H3: The Satisfaction variable explains the student's loyalty to the professor.

H4: The indicators of quality have indirect effects, channeled through the satisfaction variable, in the variable of the student's loyalty to the professor.

Insert Figure 1 here

In this model, shown in Figure 1, the quality indicators that the professor can control are based on the literature on this subject (Marsh, 1987, 1991a, 1991b), and are reflected in the following variables:

PQ1: The professor teaches clearly

PQ2: The professor teaches enthusiastically

PQ3: The professor promotes participation in class

PQ4: The usefulness and interest of the readings and recommended bibliography

PQ5: Punctuality

On the other hand, there are the service outputs, measured by means of such concepts as satisfaction and loyalty, which correspond to the following variables:

PS: Overall satisfaction with the professor

PL: Intention of registering for another course with the same professor and of recommending him (loyalty)

PROG:S: Satisfaction with the program

The indicators generate a certain level of Satisfaction that is reflected in the results (outputs). Thus, we have two types of indicators: the formative ones for the inputs and the reflex indicators for the outputs.

The use of Formative Indicators (model inputs) implies that we do not extract the common aspects of the indicators by means of a latent variable that would reflect all of these indicators, but rather that our objective is to determine the hierarchy of effects; that is, we want to know which of the PQs has the greatest effect on the Satisfaction latent variable. In this way we will be able to detect which indicators are the key ones in the process of forming satisfaction and loyalty.

On the other hand, the Reflex Indicators (model outputs) reflect the Satisfaction latent variable; in this case the common aspect of all these indicators is retained.

Model 2

This model, shown in Figure 2, includes the quality indicators associated with the student as co-producer of the teaching service. The idea introduced here is that the degree of the

student's satisfaction with the professor and the program is influenced by the student's interest in and dedication to or inclination towards a specific subject.

Thus, we need to add the following to the hypotheses embodied in the previous model:

H5: The quality indicators that the student can control—dedication and interest—also determine the Satisfaction that the student achieves after completing the course.

Insert Figure 2 here

The output structure proposed in Model 1 is maintained, although the inclusion of the student entails considering two additional indicators of the level of Satisfaction controlled by the student:

DEDIC: level of the student's dedication to the subject in terms of time;

INTERES: refers to the student's interest in the subject.

METHODOLOGY

Questionnaire

The genesis of the questionnaire used in the two Master of Business Administration programs is as follows:

1. The evaluation of the professors involved in undergraduate degree programs was begun with a survey model of approximately 35 questions. The length of the initial design required considerable effort and time to collect and analyze the responses. Factor analysis was applied to the results obtained in order to identify the main dimensions on which students base their evaluation. Starting from this analysis, it was found that the evaluation of quality in teaching is based on three major dimensions:

i) Interest in the subject

ii) Satisfaction with the professor, which depends on the following factors: well organized classes and clear explanations, the professor's enthusiasm about the knowledge transmitted, the professor's encouragement of student participation in the class, use and recommendation of suitable teaching material, punctuality and consistent maintenance of office consultation hours. These items are largely in agreement with the factors obtained in previous studies (Marsh, 1987, 1991a, 1991b; Guolla, 1999).

iii) Satisfaction with the practical classes.

2. On the basis of this analysis, the design of the survey was revised and a shorter questionnaire was developed.

3. To sound out students' opinions of Masters degree programs, the questionnaire used in the undergraduate programs was taken as a reference. After adapting it to the specific circumstances of postgraduate programs, a pre-test was conducted.

4. The definitive questionnaire was designed so that the 13 questions proposed enable the following aspects to be measured:

i) One question measures the student's interest in the subject,

ii) Eight questions evaluate the professor (one question for each of the six factors cited above, plus one item for overall evaluation and another on the student's interest in taking another course with the same professor),

iii) Two questions enable the practical classes to be evaluated, and finally,

iv) Two questions permitted us to evaluate the amount of time dedicated weekly to the subject by the student.

Sample

Students of Masters degree programs completed 3,200 questionnaires designed to evaluate their professors from 1996 to 2000. Of those questionnaires, the 2,446 that were judged valid

produced the data for the study.

Method

The methodological approach followed in this study is supported by the Models of Structural Equations with Latent Variables (Bagozzi and Yi, 1989). The program used for estimating the statistics and model parameters was EQS6. In this regard, it should be pointed out that, because the variables subjected to analysis were variables with non-normal distribution, it was decided to use Satorra-Bentler's chi-square statistic to evaluate the rightness of the adjustment of the models, the Modification Indices of the previously cited statistics, and the robust standard errors, with the objective of judging the individual significance of the parameters involved (Bagozzi and Yi, 1994, Satorra and Bentler, 1992). It should be stressed that the results obtained by means of the corrections mentioned do not differ from the ones that are obtained assuming normality.

The base model for the entire development we carried out is known as the MIMIC [Multiple Indicators and Multiple Causes] Model (Bagozzi and Fornell, 1982). This model focuses its attention on a set of formative indicators of a latent variable that is reflected in another set of indicators—in this case, reflex indicators of the latent variable or measurement model. The assumption inherent in this model is that the effects of the formative indicators on the reflex indicators are channeled through a latent variable. For that reason, it is highly interesting to determine those formative indicators that do not follow this process, that is, which require direct effects on the reflex indicators of the model. The interpretation of these direct effects (formative indicator—reflex indicator) is of great interest because, to a certain extent, they show the importance of obtaining separate measurements of the items representative of the reflex indicators. As a result, in addition to the statistics mentioned, and since the study consists of corroborating and exploring relationships, a residual matrix analysis was

performed with each model.

ANALYSIS

Satorra-Bentler's chi-square statistic estimated for Model 1 reaches the value of 73.82 with 10 degrees of freedom, which means that the proposed model does not adequately represent the relationships observed between the variables. After analyzing the Modification Indices of the Model and the residue matrix, two direct effects materialize that were not hypothesized a priori, and which should be considered. The first of these assumes a direct effect of the PQ4 variable on the PROG.S variable, and the second, another direct effect, but of the PQ1 variable on the PS variable.

After including the relationships described (two direct effects), Satorra-Bentler's chi-square statistic takes the value of 6.32 with 8 degrees of freedom and a p-value of 0.61. Therefore, this model (see Figure 3) adequately represents the structure of the relationships observed among the variables inscribed in the model.

Insert Figure 3 here

After analyzing the coefficients shown in Figure 3, it should be emphasized that not all the proposed quality indicators show significant effects on the Satisfaction variable. The PQ5 (Punctuality) indicator does not show a significant effect. Moreover, from the reading of the size of the standardized parameters representative of the direct effects, it can be deduced that these direct effects do not have the same importance with respect to the satisfaction variable.

The inclusion in the model of the two direct effects leads us to the deduction that the said

indicators, besides showing indirect effects through the Satisfaction variable on the variables Satisfaction with the professor and Satisfaction with the program, are even more closely related to the cited variables than can be seen through the indirect effects.

Model 2, shown in Figure 2, presents a bad adjustment, since Satorra-Bentler's chi-square statistic reaches a value of 239.26 with 12 degrees of freedom.

As in the previous case, the Modification Indices of the model and the residue matrix were analyzed. From the reading of these statistics, a direct relationship can be deduced between the variable representing the student's Interest and the variable Satisfaction with the Program. That is, the relationship observed between these variables is not completely reproduced through the indirect effect postulated in the model (there is an indirect effect via the Satisfaction latent variable); therefore, a direct variable can be postulated between the Interest and the PROG.S variable.

Insert Figure 4 here

When this direct effect is added and the degree of freedom in the model is reduced, the chi-square statistic declines markedly, falling to 11.29. As a result, the associated p-value reaches 0.42. Figure 4 offers the graphic representation of the model and of the estimated parameters in their standardized version; the only parameters shown are those that are significant to 5%.

As in the previous case, the effect of PQ5 on Satisfaction is zero; neither is the effect of DEDICA significant.

CONCLUSIONS

Regarding the proof of the hypotheses:

H1: This hypothesis is partially borne out, since only four quality indicators show significant effects. However, these four indicators account for more than 82% of the Satisfaction variable. Punctuality is the indicator that does not seem to affect satisfaction.

H2: This hypothesis is only feebly demonstrated, since the reliability coefficient of the PROG.S variable does not reach 0.5. The structure is confirmed, but in the knowledge that the reliability coefficient of one of the indicators is not very high.

H3: This hypothesis is borne out: the explained percentage variance of the Loyalty variable is greater than 82%. Further, the Loyalty variable is only explained by the Satisfaction variable. Therefore, the quality indicators only show indirect effects of this variable channeled through the latent variable Satisfaction.

It could even be stated that Satisfaction could be a construct nearly identical to Loyalty, since the standardized coefficient is 0.90. Therefore, for future studies, asking about Loyalty to the professor could be avoided as redundant.

H4: Accepted. The quality indicators show indirect effects, channeled through the Satisfaction variable, on the variable student Loyalty to the professor.

From the remodeling of the model we can deduce that two of the quality indicators have both indirect effects (via Satisfaction) and direct effects on the variables observed of the Satisfaction variable.

Not only do students' perceptions of the organization and clarity with which their professor performs in class affect Satisfaction (direct effect of 0.59), but they also have a direct effect on Satisfaction with the professor (effect of 0.17). The total effect of this indicator on this variable comes, therefore, to 0.624. Thus, the clarity of the professor's presentations is manifested as the most important indicator for predicting student satisfaction with the professor. In addition, it should be stressed that, when the direct variable is introduced (a new variable), the R2 of the equation increases (0.86-0.60) by 26%.

The students' perceptions of the usefulness of the material delivered by the professor affect Satisfaction (direct effect of 0.07), but they also have a direct effect on the Satisfaction they feel with the Program (effect of 0.16). The total effect of this indicator thus reaches the value of 0.19, which makes it the second most important indicator. Moreover, it should be pointed out that, when the direct effect is introduced, the R2 of the equation rises (0.40-0.30) by 10%.

In Model 2, the results obtained with Model 1 are repeated. There are only some minor differences in the estimated parameters at the hundredths level, and there is a reduction of the reliability coefficient of the Satisfaction with the Program variable. Nonetheless, the R2 of the equation increases (0.47-0.40) due to the effect of the students' Interest in the Subject indicator.

In future studies, it would be advisable to use both Measures of Satisfaction with the Professor and Measures of Satisfaction with the Program, since they do not completely replace each other. Although they do have a common core, each of them contains aspects that are specific and unique to it.

As concerns the interest shown by the student in the subject, it should be stressed that, although it has a significant effect on the latent variable Satisfaction, this indicator is closely related to the student's Satisfaction with the program. This suggests that the degree of student interest in a subject influences the assessment of overall Satisfaction, but has considerably more influence on Satisfaction with the program.

In addition, it is interesting to point out that the student's dedication to the subject taught has no effect on satisfaction. This finding seems to indicate that, although it is of interest to have the individual scores for student dedication to the different subjects taught, this indicator does not determine the student's Satisfaction.

All these considerations lead us to conclude that hypothesis 5 is partially proven.

Finally, in both models the punctuality variable does not seem to affect satisfaction, which leads us to deduce that this variable could be omitted from the questionnaire. One possible interpretation of this result is that, while punctuality is a requirement for satisfaction, since professors are generally punctual, the variable ceases to be a determining factor.

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Figure 1: Conceptual Model of the Student Satisfaction

Model 1

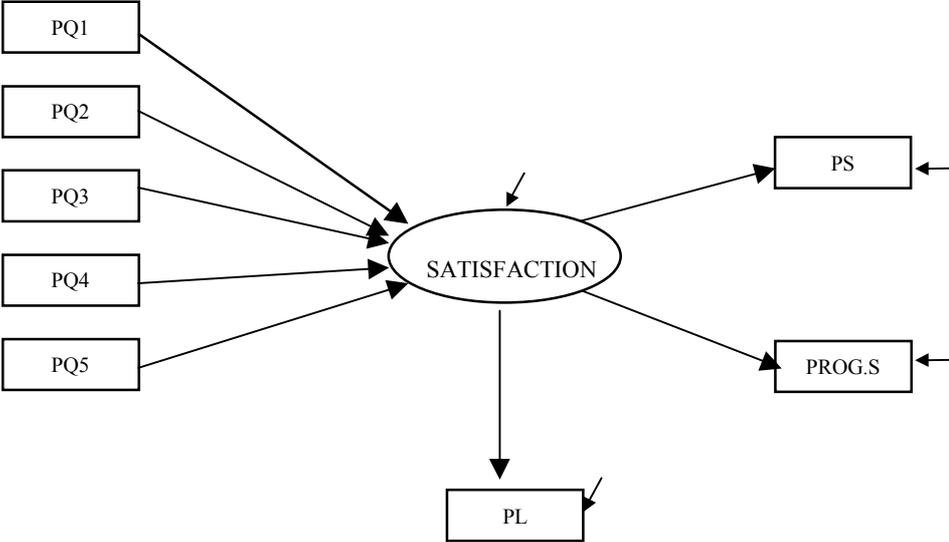


Figure 2: Conceptual Model of Satisfaction of Student as Co-producer

Model 2

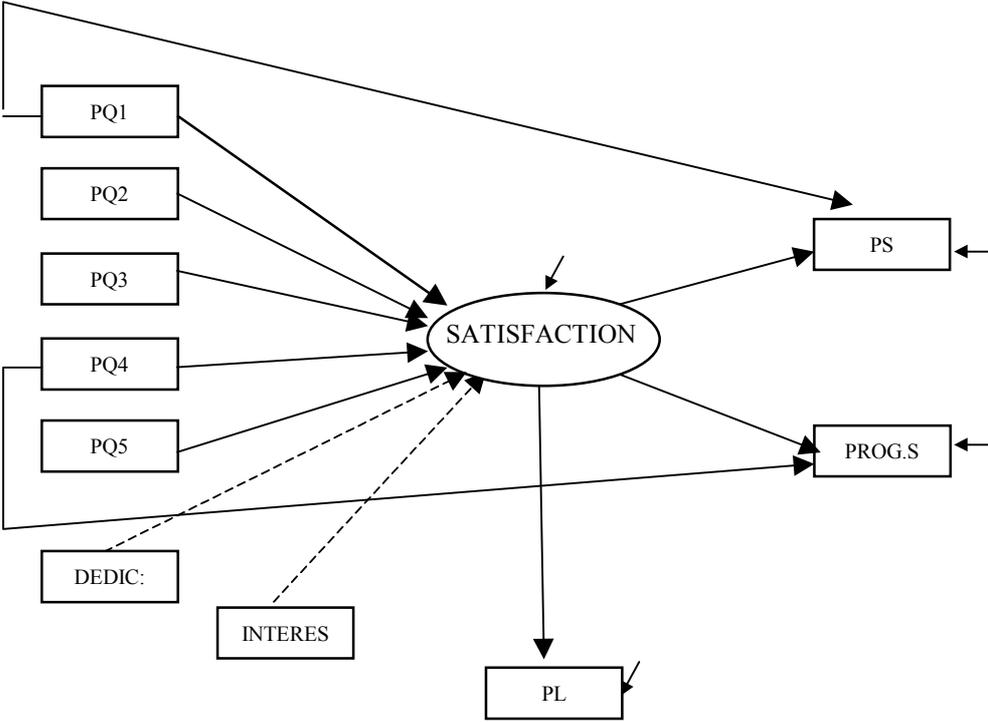


Figure 3: Model 1 Modified and Tested with Standardized Parameters

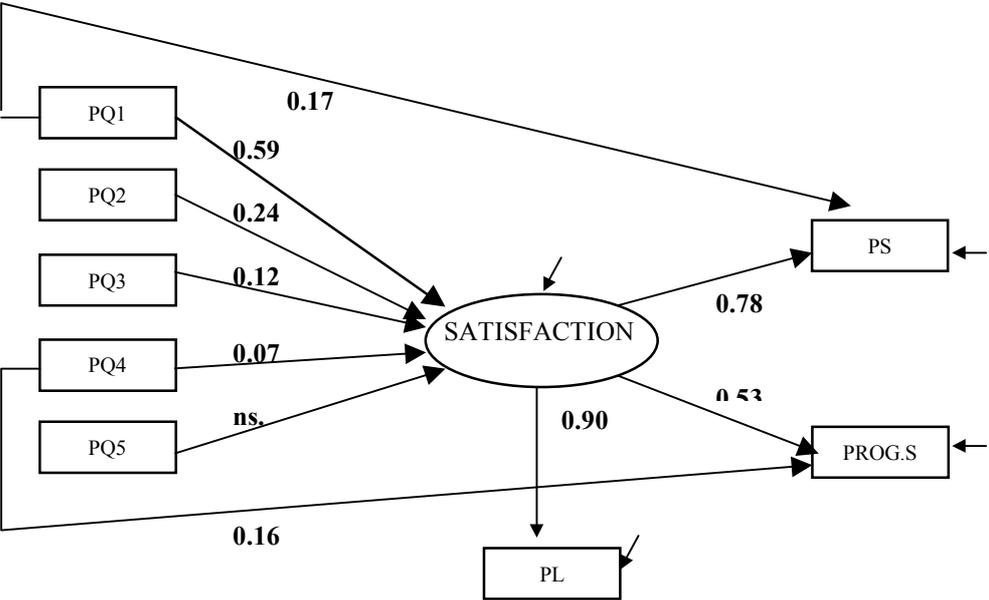


Figure 4: Model 2 Modified and Tested with Standardized Parameters

