



## THE PRINCIPAL TEACHING-LEARNING DETERMINANTS OF UNDERGRADUATE AND UNIVERSITY LECTURER MUTUAL SATISFACTION

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### Abstract

Over the past two years our University's Department for Quality has been running a study on academic achievement and doing research into satisfaction with teaching - two initiatives considered to be basic tools to improve teaching standards.

The study on achievement is based on information culled from all our subjects and studies, and includes benchmarks for effectiveness and pass rates.

In contrast, the research into teaching applies information regarding the teaching process as experienced first-hand in the classroom by students and lecturers alike, providing an opportunity to learn about and compare student and teacher satisfaction.

Quality levels for different subjects and information on key components of the teaching process can each be provided by the two reports and can be compared with the pass-rate satisfaction variable.

### Overview

This is a study of factors in university education that influence student and lecturer satisfaction. It was carried out using a voluntarily completed questionnaire at the beginning of the academic year. We employ a linear regression model with a step by step methodology in order to gauge the importance of teaching skills, the interest shown by lecturers in learning outcomes, and the effort and interest levels demanded of students.

**Key Words:** Linear Regression, Step by step method, Satisfaction.



## 1. INTRODUCTION

A previous study (Fernández et al., 2003) highlighted that purely academic factors such as pass rates (i.e. the percentage of exam passes compared to numbers sitting the examination) have a considerable influence on undergraduate satisfaction.

The first section of this study will analyse whether student satisfaction relates more to teaching staff or more to subjects taught, by comparing information on subjects taught by a number of different lecturers with information about lecturers who teach a number of subjects.

The second section tries to model the components of both undergraduate and lecturer satisfaction by applying a multiple linear regression method step by step inclusion of variables to pinpoint the most highly valued factors in each of the two scenarios (Kanji, G. 1999).

The conclusion to be drawn from joint analysis of these results and those of the earlier study (Fernández, 2003) is that undergraduate and lecturer satisfaction depends more on the quality of teaching than on a higher or lower pass rate.

## 2. DATA COLLECTION AND TYPE

This study focuses on an evaluation of subjects taught during the previous academic year; it was carried out by direct consultation with both students and lecturers via a questionnaire (c.f. appendix); individual results were then sent to each lecturer. Validity criteria for the replies were for there to be a minimum of five student questionnaires and for 90% error with respect to the number of student to be under two points. (Vavra, T.G. 1997)

Within the above framework, the study has information on 2,452 ‘information units’ (lecturer-subject pairings) made up of 1,465 subjects and 1,498 lecturers, as more than one lecturer was evaluated in 578 subjects and 712 lecturers were evaluated in more than a single subject.

The main descriptive statistics for Satisfaction with Education (V15) are:

<b>Satisfaction with University Education</b>						
	<b>Average</b>	<b>T.D.</b>	<b>Minimum</b>	<b>P(50)</b>	<b>Maximum</b>	<b>N</b>
<b>Subject Value</b>	6.19	1.59	1.00	6.19	9.83	1465
<b>Lecturer Value</b>	6.11	1.70	1.14	6.29	9.75	1498
<b>Lecturer/Subject value</b>	6.09	1.77	0.86	6.29	9.83	2452

**T.D:** typical deviation; **P (50):** Median; **N:** Sample size.

## 3. TEACHING STAFF VS. SUBJECTS

A raft of studies has already tried to gauge the influence of academic performance on undergraduate satisfaction (Fernández et al. 2003). When we tried to predict student satisfaction levels for a subject in this particular study (Natcher et al. 1992), we discovered that academic success or performance, (i.e. the percentage of students who pass compared to the number of students who either sit the examination or are registered for the course) has a fairly limited correlation with student satisfaction, and we therefore decided that the focus should be shifted towards the causes of “variability” which showed up in student satisfaction levels.

The difficulty of establishing a direct link between satisfaction and subject is highlighted by analysis of the differences between lecturers teaching the same subject (i.e. all with the same success and performance figures).



Satisfaction with Education						
	Average	Typical deviation	Minimum	P(50)	Maximum	N
<b>Number of teachers per subject</b>	2.71	1.06	2.00	2.00	9.00	578
<b>RANGE OF SUBJECT</b>	2.35	1.64	0.00	2.17	7.66	578

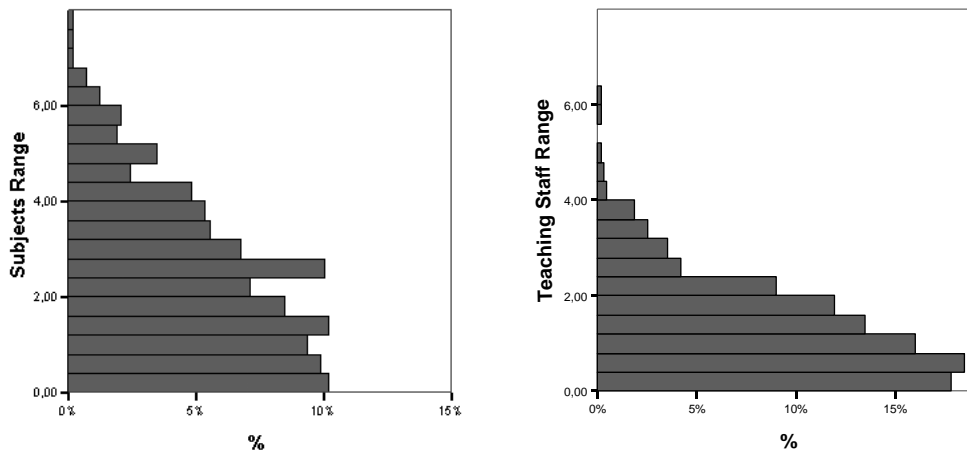
Subjects in which more that one lecturer was evaluated.

The table above shows how 578 subjects were taught by several lecturers (the average is 2.71), and how the dispersion value for satisfaction between those with the best and worst scores was 2.35 (the Shared Subject Range).

However, if we now turn to consider the different evaluations given by students from different subjects for the same lecturer, we observe a considerably lower variation: for the 712 lecturers who teach more than one subject (the average number of subjects taught is 2.34 per lecturer) the average dispersion level across subjects is 1.33 (the Lecturer Range).

Satisfaction with Education						
	Average	Typical deviation	Minimum	P(50)	Maximum	N
<b>Number of Subjects per lecturer</b>	2.34	0.62	2.00	2.00	6.00	712
<b>LECTURER RANGE</b>	1.33	0.98	0.00	1.13	6.30	712

Lecturers teaching more than one subject.



**Figure 1.** Histograms of the frequency of variables for Subject Range (left) and Lecturer Range (right).

Using the graphs to compare the distribution of different student satisfaction levels for different lecturers teaching the same subject (on the left) with different subjects taught by the same lecturer (on the right) clearly highlights that satisfaction with teaching depends more on the lecturer teaching the subject than on the subject being taught.



#### 4. CONSTRUCTING THE LINEAR MODELS.

In order to pinpoint the factors in the teaching process that determine student satisfaction with the teaching staff and vice-versa, an attempt was made to model this satisfaction variable by association with the different facets of the education process from the stance of both the student body (variables V4 to V14), and that of the lecturing staff (variables PV3 to PV8). The analysis initially included other variables, such as percentage of exam passes, number of students registered for the subject, the satisfaction levels of the academic staff and deviations regarding the overall satisfaction with the undergraduate course or overall pass rates. However, these were all rejected as they failed to add to any great extent to the model.

**A list of variables considered in relation to forecasting satisfaction**

The student survey		The lecturer survey	
(V4)	Completing the syllabus *	(PV3)	Understanding ***
(V5)	Activities and Exercises *	(PV4)	Attitude ***
(V6)	Evaluation *	(PV5)	Willingness to study ***
(V7)	Information about Results *	(PV6)	Work handed in ***
(V8)	Subject Knowledge *	(PV7)	Material ***
(V9)	Didactic skills *	(PV8)	Physical Environment ***
(V10)	Material *		
(V11)	Interest *		
(V12)	Availability *		
(V13)	Subject Learning Difficulties *		
(V14)	Physical Environment *		

\* These variables were also broken down into the opinions of students professing to have attended over 50% of the classes and those admitting having attended a lower percentage of classes.

\*\*\* Scores given by the teaching staff on the questionnaire are in the appendix.

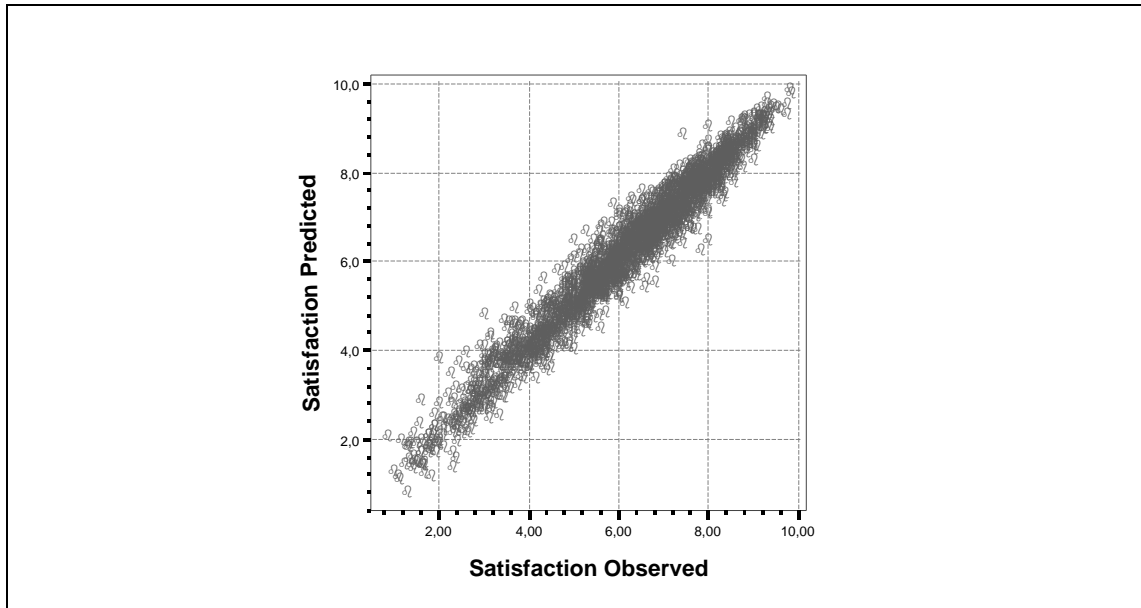
#### Forecasting student satisfaction with lecturers.

		Constant	Typical coefficient		Confidence interval for B at 95%	
			B	Typ. Error	Lower limit	Upper limit
1	<b>Didactic skills</b>	<b>V9</b>	-0.454	0.077	-0.606	-0.302
2	<b>Subject difficulty</b>	<b>V13</b>	0.332	0.014	0.305	0.360
3	<b>Evaluation and assessment</b>	<b>V6</b>	0.249	0.029	0.192	0.306
4	<b>Subject Knowledge</b>	<b>V8</b>	0.222	0.013	0.195	0.248
5	<b>Availability</b>	<b>V12</b>	0.092	0.016	0.061	0.123
			0.142	0.029	0.086	0.198

Dependent Variable: General Satisfaction (V15)

R<sup>2</sup> corrected 0.9576

$\text{Satisfaction} = 0.332 \cdot \text{Didactics} + 0.249 \cdot \text{Subj. Diff} + 0.222 \cdot \text{Eval} + 0.092 \cdot \text{Subj. Know} + 0.142 \cdot \text{Avail} - 0.454 \quad [1]$
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**Figure 2.** Scatter diagram showing the relationship between observed values and those forecast by the model [1].

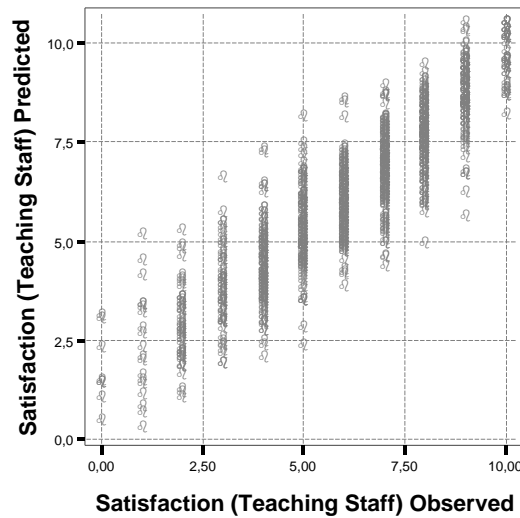
We maintained the five **most representative variables** when constructing the satisfaction model, as improvement was insignificant when the other variables were factored in.. In the order in which they were factored in, the factors which most consistently affect student satisfaction with lecturers are *the ability to explain clearly (V9)*, and *attention to difficulties posed (V13)*; the link between *subject evaluation and subject content (V6)* was the third factor.

**Prediction of lecturer satisfaction with the student body**

		Non-standardized coefficient		Confidence interval for B at 95%	
		B	Typ.Error	Lower limit	Upper limit
	<b>Constant</b>	-0.877	0.110	-1.093	-0.660
<b>1</b>	<b>Commitment PV5</b>	0.353	0.024	0.306	0.401
<b>2</b>	<b>Work completion PV6</b>	0.178	0.017	0.144	0.212
<b>3</b>	<b>Pass Rate PV9</b>	0.227	0.016	0.195	0.259
<b>4</b>	<b>Interest in subject PV4</b>	0.200	0.023	0.156	0.244
<b>5</b>	<b>Understanding PV3</b>	0.173	0.021	0.131	0.215

Dependent Variable: General Satisfaction (PV10)  
R<sup>2</sup> corrected, 0.808

$$\text{Satisfaction Rate} = 0.353 \cdot \text{Level} + 0.178 \cdot \text{Work comp} + 0.227 \cdot \text{Pass Rate} + 0.200 \cdot \text{Interest} + 0.173 \cdot \text{Understand} - 0.877 \quad [2]$$



**Figure 3.** Scatter diagram showing observed values compared with those predicted by the model [2].

The factors that most consistently effect lecturer satisfaction with the student population are, in order: *dedication and effort (PV5 and PV6)*, *those who have made an effort to study pass (PV9)* and *attitude and ability (PV4 and PV3)*.

## 5. CONCLUSIONS.

1. Student satisfaction with the teaching imparted depends more on the lecturers than on the subjects they teach (Breen, R. 2000); the characteristics that students most appreciate are *clarity of explanation (didactic skills)* and *awareness by the lecturers of the difficulties students face*.
2. Clarity of explanation is backed up by *Knowledge of the subject*; concern for learning difficulties is very much linked to *availability* and attention to student needs. This combination of technique and a personal approach to students is a good model for guaranteeing student satisfaction.
3. Members of the teaching staff, for their part, feel satisfied with teaching insofar as they observe dedication, effort and results in line with ability and attitudes amongst their students.
4. Thus, evaluation of the mutual satisfaction of students and teaching staff can be built upon three dimensions: the first is clearly linked to the teaching-learning process and counterpoints lecturers' *clarity of explanation* with the *requirement to study* the subject; the second is related to results and, more precisely, to *coherence of evaluation*, insofar as this term refers to adhering to the syllabus that was taught and to the idea that those who have made an effort should pass the examination (Mortensen et al. 1999). The third dimension is of a personal nature and counterpoises lecturers' attention to students and the difficulties they experienced, and the capacity and interest in the subject shown by students.



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## APPENDIX

### Students' Questionnaire

<b>GENERAL INFORMATION</b>
1.- The usual number of students who attended lectures on this subject was: (A: less than 10, B: between 11 and 20, C: between 21 and 50, D: Over 51)
2.- My personal lecture attendance rate : (A: less than 25% B: between 25% and 50% C: between 51% and 75% D: Over 75%)
3.- My mark for this subject was (A: Fail, B: Pass C: Good D: Outstanding/ Exam Award)
<b>COMPLETING THE SYLLABUS</b>
4.- The key elements of the syllabus were dealt with during the course.
5.- Activities and practical exercises were suitable to the facilities available.
6.- Evaluation coincided with the syllabus content that the lecturer taught.
7.- The lecturer announced examination results within the expected deadlines.
<b>TEACHING STYLES</b>
8.- The lecturer demonstrated good knowledge of the subject.
9.- The lecturer explained in a clear manner.
10.- Materials recommended by the lecturer proved useful.
<b>LECTURER ATTITUDES</b>
11.- The lecturer showed interest in the subject matter.
12.- The lecturer was available and ready to provide students with attention.
13.- The lecturer showed concern for learning difficulties that students faced.
<b>GENERAL EVALUATION</b>
14.- On the whole, physical conditions (lecture halls, facilities, acoustics, lighting, ventilation, heating, etc.) where lectures were given were adequate.
15.- All things considered, I am satisfied with the work of the lecturer.





## Lecturers' Questionnaire

<b>GENERAL INFORMATION</b>
1.-The usual number of students who attended lectures on this subject was: (A: less than 10, B: between 11 and 20, C: between 21 and 50, D: Over 51)
2.-Percentage of students who attended tutorials at least once during the course: (A: less than 25%, B: between 25-50%, C: between 51-75 %, D: over 75%).
<b>ABILITY AND ATTITUDE</b>
3.-The average level of understanding shown by the student body was sufficient to complete the course satisfactorily
4.- Students showed interest in the subject matter.
<b>COMMITMENT AND EFFORT</b>
5.- Students studied in line with the demands of the subject.
6.-Students completed any work set.
7.-Students used the materials recommended for the subject.
<b>GENERAL EVALUATION</b>
8.-On the whole, physical conditions (lecture halls, facilities, acoustics, lighting, ventilation, heating, etc.) where lectures were given were adequate.
9.- The pass rate conforms to expectations.
10.- On th whole I am satisfied with the work done by students doing this subject.