

STUDENT SATISFACTION AND QUALITY OF EDUCATION AT THE UNIVERSITY OF BARI

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ABSTRACT

The process of measurement, evaluation and efficiency improvement of the Italian Universities has become fundamental for the accountability to various stakeholders: students and their families, institutions, companies and especially the Government, that is the main financier. Recently, the Italian universities have adopted a competitive behavior in order to maximize their share of public resources allocation, in a framework of constant reduction in funding. In this competitive scenario, students can be considered as "customers", since they can choose the university in which to enroll or change it in the case of dissatisfaction if it doesn't meet their expectations (Petruzzellis et al., 2006). For this reason, Universities should plan their "educational offer" also on the basis of the needs expressed by their stakeholders, first of all taking care about students' placement and continuous improvement of service quality. The last reform of the Italian university system has been aimed at improving the quality of service offered, entrusting the National Agency of Evaluation (ANVUR) to oversee the related processes. Using the data collected by the last survey "Opinione degli studenti", this paper deals with the assessment of the student's satisfaction in the three areas of education, teaching and interest for academic courses, as stated by Anvur questionnaire. Through a descriptive and a multivariate statistical analysis (Principal Component Analysis), student satisfaction has been measured with reference to the quality of teachers, teaching materials, and logistical support, under the most relevant variables: students' percentage of lessons attendance, type of course (first and second level degree) and course scientific group. It emerges that the quality of teaching seems to be related to "tangible aspects" as perceived by students: teaching materials, interesting lessons, teacher clearness, coherence topic consistency with the contents of the course website, teacher availability for additional explanations. In the following years, one of the most important challenges for the academic courses coordinators might be the adoption of specific initiatives aimed at reaching the 100% of satisfied students; they have to be sure of the reliability of student judgments.

Keywords: *students satisfaction, quality of teaching, effectiveness*

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1. Introduction

In the last decades, characterized by a period of a global recession, Italian Universities have experienced severe resource constraints. Also due to a reduction in funding, there has been an increasing interest of the Ministry of Research (from now MIUR) in designing methods to evaluate academic performances in order to rank efficient universities and to reduce potential inefficiencies, so providing the administration authorities with measures that may be used for an optimal resources allocation. Side by side to this increasing interest in University performance, a wide academic debate about the models and measures to be adopted has emerged. The methodology is based on several quantitative input measures that have been largely borrowed from the evaluation methodologies of the main European Association, as ENQUA, more consolidated in its experience. Among the adopted resources allocation models, we cite the one introduced by MIUR last year, based on the students evaluation in terms of standard cost and the “customers” satisfaction survey, named *Opinione degli studenti*, whose main goal is to provide an independent system of regular evaluation of student satisfaction and of the university teaching quality.

The aim of this paper is to deal with the student's opinion about the quality of teaching, considered as “users” attending the academic courses in the University of Bari. Quality is a multidimensional concept and it is concerned with several variables: comfortable spaces and seats in the classrooms, equipment and scientific laboratories for teaching, professionalism of the teaching and administrative staff, assistance and tutoring services, apprenticeship opportunities, equipped laboratories for technical-practical and laboratory activities.

The Government, the main financier of Italian Universities, considers the level of student satisfaction a matter of great importance to evaluate the quality of their courses. It is actually measured by different points of view as the quality of teachers, teaching materials, and logistical support. Since 1999, with the law n.370, Italian Universities have to systematically carry out a survey (called *Opinione degli studenti*) to measure the satisfaction of their students about “teaching. Recently, the National Agency of Evaluation (from now ANVUR) has been entrusted to oversee the processes related to this survey, starting from the step of data collection. Since 2013, the University of Bari, like the other Universities, has adopted the ANVUR guidelines.

2. Data and methods

According to the last ANVUR release of the survey, Italian Universities have to administer three questionnaires: two questionnaires addressed to students, respectively with more than 50% percent of lessons attendance (questionnaire n.1) or less than 50% percent of lessons attendance (questionnaire n.3) and the questionnaire n.2 to the teachers. ANVUR suggests that Universities should carry out the online survey after 75% of lessons held or, at least, when the student is booking for his exam.

The questionnaire number 1 is the most complete because it has to be filled by the students with more than 50% percent of lessons attendance (Table 1); it is composed of eleven questions grouped into three sections: the first one focuses on the subject, the second on the teacher and the teaching services while the last one concerns the student's interest in the subject. The questionnaire number 3, being addressed to those students who have less than 50% percent of lessons attendance, shows the same composition, except for the lack of questions from 5 to 10

which need the attendance of the lessons to be answered. In order to avoid duplications, we only discuss the complete student questionnaire, specifying that the other one (number 3) has an identical content except for the section “teaching” (questions from 5 to 10). An important innovation in the last survey is the presence of 9 suggestions that the student can choose, in addition to the questions. This part contains precious information for the improvement of the quality of teaching and will be deeply analyzed in this paper.

As above said, the questionnaire number 2 has to be filled by the teacher and contains questions aimed at measuring his perception of quality of teaching. Due to the presence of different questions, this last questionnaire is incomparable with those filled by students. Therefore, it is not possible to explore our interesting research hypothesis concerning the assessment of the satisfaction gap between the “provider” and the “beneficiaries” of the teaching services. The questionnaires apply a 4-item Likert scale (definitely “no”; more “no” than “yes”; more “yes” than “no”; definitely “yes”).

Table 1: ANVUR students’ questionnaire

<p>Subject</p> <ol style="list-style-type: none"> 1. Was your prior knowledge sufficient for understanding the matters stated in the final exam? 2. Is the required load of study proportional to the assigned credits? 3. Is the teaching material (indicated and available) suitable for studying the subject? 4. Were the examination methods clearly defined? 5. Teaching 6. Are the unwinding times of lectures, tutorials, and any other educational activities respected? 7. Does the professor stimulate/motivate the interest in the subject? 8. Does the teacher clearly set out the arguments? 9. Are the supplementary activities (exercises, tutorials, workshops, and so on), if any, useful for learning the subject? 10. Was the teaching carried out consistently with the statements of the website course? 11. Is the teacher available for clarifications and explanations? <p>Interest</p> <ol style="list-style-type: none"> 1. Are you interested in the topics covered on the subject? <p>Suggestions</p> <ol style="list-style-type: none"> 1. Lighten the study load 2. Increase the educational support activities 3. Provide more basic knowledge 4. Delete the program topics already covered in other teachings 5. Improve coordination with other teachings 6. Improve the quality of teaching materials 7. Provide course materials in advance 8. Insert the intermediate exams 9. Activate evening teachings
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3. Results

3.1. The statistical descriptive analysis

We analyzed the data of 189,698 questionnaires collected in the academic year 2013-2014 and completed by the students attending the academic courses of the University of Bari in four scientific groups: Health, Science, Liberal Arts and Social.

The analyzed questionnaires are related to 115 courses each of them lasting a different period of time (Table 2): the 60.7% of the collected questionnaires belongs to students attending a three-years course (L2), the 11.0% comes from the following two-years courses (called LM) that are needed to complete the academic career started in an L2 course, the 12.8% from the five-years courses (in particular Law, Dentistry, Veterinary Medicine and Pharmacy) and the last 15.4% is represented by the questionnaires of students attending the six year course of Medicine.

Table 2: Percentages of questionnaires collected among the students of the University of Bari enrolled in the academic year 2013-2014 according to the level of degree

Level of degree	% of questionnaires
L1- four-years course	0.1
L2- three-years course	60.7
LM- two-years course	11.0
LM5 - five-years course	12.8
LM6- six-years course	15.4
Total	100.0

Expecting to find interesting differences, through a descriptive a multivariate statistical (PCA) analysis, we deal with student's satisfaction considering the most relevant variables:

- Students' lesson attendance more than 50% or less than 50%;
- Type of course (first and second level degree);
- Course scientific group (considering the four MIUR OFF classification areas: Health, Scientific, Liberal arts, Social).

The first overview on students satisfaction can be obtained by analyzing the variable "lessons attendance", which divides students into two groups named respectively F - Frequentanti, composed by students with lesson attendance >50% and NF – Nonfrequentanti, composed by students with lesson attendance <50%.

As we can observe in Fig.1 in the Appendix, for each question, we find out almost the same judgments distribution: at least a 25% of negative judgments and a 75-80% or more for positive judgments. Then, the level of satisfaction can be defined high (p-value=000), with a significant difference between F (students with lesson attendance >50%) and NF (students with lesson attendance <50%).

The second stratification variable is the type of course (first and second level degree). As shown in Fig.2 in the appendix, almost the same judgments distribution in each question can be observed: at least 15% of negative judgments versus 85% or more positive judgments. The level of satisfaction is high and there is a significant difference among the degree levels. Considering that several students decide to leave the University of Bari to attend their second level degree courses in different Universities, located in regions whose economy is more prosperous and offers better job prospects, we expected different results.

The third analysis is based on the course scientific group, considering the four MIUR OFF classification areas: Health, Scientific, Liberal Arts, Social. Even if we changed the stratification

variable, we find out the same very high level of satisfaction, regardless of the scientific area, as shown in more detail in the Fig. 3 of the appendix, p-value=0,000).

3.2. The multivariate analysis for measuring student satisfaction

In order to reduce the starting set of variables to the most significant ones, we adopt a multivariate statistical model. In particular, we run a Principal Component Analysis with PROMAX rotation and a backward procedure as follows:

1. in the first step all eleven questions are considered;
2. in the second step, the questions with lower values are removed and PCA is run again;
3. in the third step, a measurement of the overall satisfaction is obtained.

In running the Principal Component Analysis we put the hypothesis that students belong to two different groups on the basis of the following issues:

- ✓ F-Frequentanti, with a percentage of lesson attendance $\geq 50\%$ and 154,919 questionnaires and NF-Non frequentanti with a percentage of lesson attendance $< 50\%$ and 34,770 questionnaires;
- ✓ the two groups fill out different questionnaires (11 questions vs 6 questions);
- ✓ the two groups are considered to be totally independent, also in the calculation, but we obtain the same results.

As shown in Table 3, considering the group F-Frequentanti, who answered to 11 questions, the first component explains only the 52.6% of the variance. Therefore, we remove the questions with lower values (q1, q2, q5, q11) as they seem to be poorly related to the quality of teaching. Then, we run a PCA on the new set of six variables and the percentage of explained variance increases at 65.4% (Keiser Meyer Olkin test=0,890, Table 4).

Table 3: Percentage of explained variance and commonality in the 11 questions model for students attending more than 50% of the lessons

Component	Initial eigenvalues			Not rotated factor loans			Community		
	Total	% of variance	% accumul.	Total	% of variance	% accumul.	Questions	Initial	Extraction
1	5.783	52.570	52.570	5.783	52.570	52.570	Q1	1.000	.317
2	.922	8.382	60.952				Q2	1.000	.382
3	.720	6.543	67.495				Q3	1.000	.593
4	.597	5.427	72.922				Q4	1.000	.533
5	.549	4.990	77.912				Q5	1.000	.478
6	.523	4.759	82.670				Q6	1.000	.677
7	.484	4.396	87.067				Q7	1.000	.671
8	.432	3.925	90.992				Q8	1.000	.520
9	.403	3,665	94,656				Q9	1.000	.651
10	.355	3.228	97.884				Q10	1.000	.584
11	.233	2.116	100.000				Q11	1.000	.377

Extraction method: Principal Component Analysis.

Table 4: Percentage of total explained variance and commonality in the 6 questions model for students attending more than 50% of the lessons

Component	Initial eigenvalues			Not rotated factor loans			Community		
	Total	% of variance	% accumul.	Total	% of variance	% accumul.	Questions	Initial	Extraction
1	3.924	65.403	65.403	3.924	65.403	65.403	Q3	1.000	.609
2	.546	9.107	74.509				Q4	1.000	.584
3	.499	8.320	82.829				Q6	1.000	.709
4	.426	7.092	89921				Q7	1.000	.719

5	.368	6.130	96.051	Q9	1.000	.676
6	.237	3.949	100.000	Q10	1.000	.627

Extraction method: Principal Component Analysis.

The obtained set of questions can be considered more reliable than the previous one; it leads us to point out the «core» variables defining the overall satisfaction as perceived by the students of the University of Bari. The quality of teaching seems to be related to what we can be defined “tangible aspects” for a student: teaching materials (Q3), examination rules (Q4), interesting lessons (Q6), teacher clearness (Q7), topics consistency with the statements on the course website (Q9), teacher availability for additional explanations (Q10).

Now we replicate the analysis for the NF group, composed of the students who answered to 6 questions. Running the PCA, the first component explains only 49.9% of the variance (Table 5).

Table 5: Percentage of explained variance and commonality in the 11 questions model for students attending less than 50% of the lessons

Component	Initial eigenvalues			Not rotated factor loads			Communality		
	Total	% of variance	% accumul.	Total	% of variance	% accumul.	Questions	Initial	Extraction
1	2.992	49.860	49.860	2.922	49.860	49.860	Q1	1.000	.431
2	.800	13.331	63.191				Q2	1	.474
3	.689	11.490	74.680				Q3	1.000	.629
4	.580	9.675	84.355				Q4	1.000	.542
5	.496	8.261	92.616				Q10	1.000	.504
6	.443	7.384	100.000				Q11	1.000	.412

Extraction method: Principal Component Analysis.

Therefore, we remove the questions with lower values (q1, q2, q11) and run a PCA on the new set composed of the remaining three variables; the percentage of explained variance increases at 66.8% (Keiser Meyer Olkin test=0.699, Table 6). For the group of students attending less than 50% of the lessons held, the quality of teaching appears to be related exactly to the same aspects highlighted before and called the “tangible aspects”: teaching materials (Q3), examination rules (Q4), teacher availability for additional explanations (Q10). At this point, we are able to define the global satisfaction factor as highly related to the “tangible aspects”.

Table 6 Percentage of total explained variance and commonality in the 6 questions model for students attending less than 50% of the lessons

Component	Initial eigenvalues			Not rotated factor loads			Questions	Initial	Extraction
	Total	% of variance	% accumul.	Total	% of variance	% accumul.			
1	2.003	66.761	66.761	2.003	66.761	66.761	Q3	1.000	.659
2	.531	17.698	84.458				Q4	1.000	.695
3	.466	15.542	100.000				Q10	1.000	.649

Extraction method: Principal Component Analysis.

On the other side, this leads us to suppose that the students consider some questions as «empty» questions if related to the teaching quality dimension; some “meaningless” questions could be, for example, “Are you interested in the topics covered in the teaching/subject?” (Q11), or “Was your prior knowledge sufficient for understanding the matters stated in the final examination?” (Q1), and “Where the examination rules clearly defined?” (Q4). More probably, students consider the aspects related to these last questions as “exogenous” variables. For example, they don’t

believe they could have a positive influence on the reduction of the teaching “load” in terms of subject/topics to be studied, as asked by Q2 “Is the load of study required proportional to the assigned credits?”.

Precious information for the academic course coordinators come from the student's suggestions (Table 7). If we put the items in a decreasing order according to the frequency, the highest belongs to the reduction of the teaching load in terms of study effort (29.3%), to be read along with the introduction of intermediate exams (23.9%), followed by the exigence of a preparatory strengthening of the basic knowledge before starting the official course (25.2%) and of an improvement in the quality of teaching materials (24.3%), better if delivered in advance (23.2%). Students acknowledge the added value brought by the support activities (22.9%) but, since almost the totality of them doesn't work during their academic experience, they are not interested in possible evening teachings.

4. Conclusions

The survey “Opinione degli student”, yearly held in Italian Universities, aims at measuring the students' perception of teaching quality. It has been conceived as a national standardized survey which will allow, among other goals, the Ministry of Research and Education to organize a database which is useful for the evaluation of the quality of teaching in the Italian Universities and, more probably, in the nearest future, for the allocation of financial resources. At University or Department level, inside the governance process, the results of the survey may represent precious information for improving the quality of the courses, either about the issues strictly related to teaching or about the organizational and logistic aspects. Anyway, a certain caution in handling the data collected through this survey is essential because there is no evidence that students expressed their judgments with the awareness of being a part of an awkward evaluation process with important outcomes. Moreover, the fear of lack of privacy could have affected the judgments expressed by the students, as their answers look too “compliant”. Another important issue is that the survey produces a measure of students' perception, not a direct measure of quality and therefore it might be influenced by a variety of biases, first of all, the effect of prior expectations. A further development of this first analysis is to deal with a set of indexes which can measure the reliability of the data so that they can be useful in sustaining the decisional process; they could be used as an input in the evaluation models, for example, in the allocation of internal funds. To move from solid foundations, a comparison with other Italian Universities' experience in this survey would be very interesting, even if the presence of “dubious” high positive evaluations has also emerged in other researchers. Looking at the present work, the results of the analysis show a high level of the overall satisfaction of the students of University of Bari enrolled in all the courses, with no differences among Health, Liberal Arts, Scientific and Social areas (D'Uggento, Manca and Girone, 2016). The quality of teaching perceived by a student seems to be related to what can be defined “tangible aspects”: teaching materials, interesting lessons, teacher clearness, topics consistency with the statements on the course website, teacher availability for additional explanations. In the following years, one of the most important challenges for the academic courses coordinators might be the adoption of initiatives aimed at reaching 100% of the satisfied student, after being sure about the reliability of their judgments.

Table 7: Suggestions from the students of the University of Bari to improve the quality of teaching in their courses

Suggestions	Number of responses	% of the total of questionnaires
Lighten the teaching load	38,918	29.3
Provide more basic knowledge	33,509	25.2
Improve the quality of teaching materials	32,335	24.3
Insert the intermediate exams	31,727	23.9
Provide course materials in advance	30,829	23.2
Increase the educational support activities	30,479	22.9
Improve coordination with other teachings	22,73	17.1
Delete the program topics already covered in other teachings	22,148	16.7
Activate evening teachings	3,699	2.8

References

1. Alwan L.C. (2000). *Statistical Process Analysis*. Irwin McGraw-Hill.
2. Catellani L., B.M. Colosimo, M. Grandini, S. Heinemann, (2006). A statistical tool for the analysis of Student Satisfaction questionnaires, *Proceeding of the 9th Toulon- Verona Conference, Excellence in Services*. September 7th-8th, Paisley, Scotland, pp. 223-234.
3. Catellani L., B.M. Colosimo, Q. Semeraro (2006). Critical issues in detecting out-of-control samples in Customer Satisfaction Surveys, *International Journal Total Quality Management & Excellence*. Proceeding from International Convention on Quality 2006. May 21st - 25th 2006, Belgrade, Serbia, 34(1-2), pp. 15 – 23.
4. Fabbris, L. (2012). *Indicators of Higher Education Effectiveness*. McGraw-Hill, Milano.
5. Fabbris, L. (1997). *Statistica multivariata. Analisi esplorativa dei dati*. McGraw-Hill, Milano.
6. Gaede C.S., K.G. Lewis (2005). *Considering the Validity of the Interpretation of Student Ratings of Teaching*, Report Online, University Texas and Austin, February 16.
7. Harvey L. European Quality Assurance Forum 2006. "Embedding Quality Culture In Higher Education" Technische Universität München, Munich, Germany 23-25 November 2006.
8. Lo, C. C. How student satisfaction factors affect perceived learning, *Journal of the Scholarship of Teaching and Learning*, Vol. 10, No. 1, January 2010, pp. 47 – 54.
9. Petruzzellis L., A. M. D'Ugento, S. Romanazzi (2006). Student satisfaction and quality of service in Italian universities. *Managing Service Quality*, Vol.16 No.4, 2006. Emerald Group Publishing Limited, ISSN 0960-4529.

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