

# New Insights on Students Evaluation of Teaching in Italy

## *Nuove analisi sulle valutazioni degli studenti in Italia*

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**Abstract** This work presents new analyses on the relationship between student evaluation of teaching and student, teacher and course specific characteristics, exploiting the richness of information collected by a new survey carried out among professors of the University of Padua. Data collected in this survey are able to highlight teacher needs, beliefs and practices of teaching and learning. This allows to introduce in the study some *subjective* traits of the teachers. The role of these new variables in explaining student evaluations is deeply investigated.

**Abstract** *In questo lavoro vengono presentate delle nuove analisi sulla relazione fra le opinioni espresse dagli studenti per la valutazione della qualità della didattica universitaria e caratteristiche specifiche del corso, degli studenti e dei docenti, sfruttando la ricchezza di informazioni raccolte per mezzo di una nuova indagine realizzata tra i docenti dell'Università di Padova. Questa indagine è in grado di evidenziare i bisogni, le credenze e le pratiche dei docenti legate alle loro attività didattiche, permettendo di introdurre nelle analisi un insieme di caratteristiche soggettive dei docenti. Il loro ruolo viene quindi approfonditamente studiato nelle successive analisi.*

**Key words:** Record linkage, student evaluation of teaching, teacher opinions

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## 1 Introduction

Students' opinions and judgements of teaching performances play a substantial role in higher education, particularly as instruments for gathering information on the quality of education and evaluating university courses [1, 8]. The relationship between student-, teacher-, course-specific characteristics and student evaluation of teaching (SET) is the topic of a huge amount of works in the literature (see an extensive review provided by [6]). However, findings concerning the relationship between SETs and the characteristics of courses, students and teachers are sometimes contradictory. Thus, these characteristics usually explain only a small portion of the total variance in SETs scores [5].

It is generally accepted that a multilevel analysis of the students' ratings is a satisfactory approach for investigating teaching evaluations, because of the hierarchical nature of the data (i.e. university students nested into classes) [3].

This work aims at enriching the multilevel literature on the student evaluation of teaching proposing some original analyses based on a wider set of teacher-specific characteristics, including also teachers' opinions on their teaching activities. This work exploits an innovative and original dataset available at the University of Padua, obtained after linkage of survey and administrative data coming from three different sources: first, the conventional survey on the student evaluation of teaching carried out among university students; second, administrative data related to the main features of the teachers and the didactic activities (DAs) they are involved; third, a new CAWI survey carried out by means of the research project PRODID (Teacher professional development and academic educational innovation). It started at the University of Padua in 2013, with the aim of developing strategies to support academic teachers and enhance their teaching competences. A specific questionnaire was then developed and addressed to all professors involved in almost all didactic activities of the University. This new survey collected opinions, beliefs and needs of the professors, with regard to their teaching activities developed in their classes.

This work is organised as follows. Section 2 introduces the data of this analysis, while the empirical application (model specification and results) is described in Section 3. Section 4 ends the paper, highlighting the main conclusions and some suggestions for future works.

## 2 The data

This work investigates data obtained by merging three different datasets coming from the University of Padua. The reference is the 2012-2013 academic year.

The first one is the standard online survey carried out by the University to measure students' opinions on the didactic activities. It involves all students who have been attending lessons of any degree courses of the Athenaeum. Students were asked to express their level of satisfaction on a scale from 1 to 10 (being 1 the lowest level) to a set of 18 items (seven if the student attended less than 30% of the lessons).

The second one is the administrative dataset that collects information on the teachers and the didactic activities of all Padua academic institutions.

The third one is an innovative dataset, collected by means of a new online survey aiming at providing a picture of the teaching experiences developed in the university classrooms. Indeed, the University of Padua in 2013 promoted the *PRO-DID* project (Teacher professional development and academic educational innovation - "Preparazione alla professionalità docente e innovazione didattica") with the purpose of developing an integrated system to improve teaching competences and academic innovation. The PRODID project promoted a research-based approach to creating training programs, faculty learning communities, pilot experimental contexts where teaching innovation could be tested and monitored ([2]). Following an evidence-based approach, the project aimed at highlighting teachers' needs, beliefs and practices of teaching and learning, which may constitute a privileged context for the development of innovative teaching activities within the institution.

The final questionnaire was developed according to the Framework of Teaching of [7] and was composed by three sections. The first section focuses on *practices* developed by the Padua professors in their teaching activities. The teacher is thought as a facilitator of the learning processes and for this reason the section asks for each DA (at most three) about the application (or not) of some specific practices in his/her activities. Eight items are collected. Six indicators are then constructed and five of them are obtained considering separately as dummy variables the first five items: *implementation of practices for actively getting involved students; proposal of external contributions (i.e. stakeholder); monitoring students learning during the course by means of specific tests/other ways; assessment of students learning using various types of examination; modification of teaching practices according to SET*. The sixth indicator is calculated summarising in a single dummy variable the last three items of the section (*reporting at least one activity involving technology practices*), since these three questions collect similar information on these practices. The second section deepens teachers' *beliefs* about teaching in higher education. By means of 20 questions, in a scale from 1 (fully disagree) to 7 (fully agree), some general dimensions are investigated: the Person as Teacher, Expert on Content Knowledge, Facilitator of Learning Processes and Scholar/Lifelong Learner. Considering also some questionnaire validation analyses (a factor analysis in particular), six factors are defined (they substantially replicate the aforementioned dimensions), calculated as the average values of the answers within each factor. These factors may be summarised as other subjective characteristics of the teachers: i) *passion for teaching*; ii) *passion for research*; iii) *feeling the need of support for improving teaching activities*; iv) *will to change teaching activities according to students needs*; v) *features of teaching and learning methods*; vi) *features of teaching and evaluation activities*. The third section focuses on teachers' *needs*, that are collected through some open-ended questions (however, they are not exploited in this analysis).

The PRODID questionnaire was addressed to all teaching staff of the University of Padua involved in any DA during the academic year 2012-2013; the response rate of this survey was slightly lower than 50%.

In this analysis we consider only students who attended at least 50% of lessons, involved in courses of the bachelor degree and enrolled in any undergraduate programmes, but Medicine. In the end, we excluded courses with a number of units smaller than five (in order to avoid comparisons based on too few ratings). According to these criteria, the linkage of the different sources led to a final dataset composed by 23605 complete records, based on students' evaluations.

### 3 The analysis

The analysis of the dataset described in the previous Section is based on the estimation of a multilevel random intercept model [4], where the level-1 dependent variable is the overall level of satisfaction (based on Item 14). Level-2 units are the DAs of each teacher. This choice follows from the fact that, within each course, the student is asked to evaluate the activities of each professor having a minimum number of hours taught in the course. The student degree is not a further level, but it is controlled by means of fixed effects. The total number of level-2 units is equal to 590, while 40 is the average number of observations per group.

In general, the rating of a student to a given item for a certain course may depend on course-related factors (class size and heterogeneity, course difficulty and so on), student-related factors (gender, age and so on) and teacher-related factors (age, gender, personal traits and so on) [6]. According to the aims of this work and the features of our dataset, the set of our explanatory variables may be divided in:

- Course characteristics: compulsory course, total number of hours, more than one teacher involved, location (in Padua or outside), shared course.
- Student - general characteristics: gender, age.
- Student - university career: year of enrolment, average (per year) number of passed exams, average grade of the exams in the referred academic year.
- Teacher - general characteristics: gender, age.
- Teacher - university career: academic position.
- Teacher - DA characteristics: proportion of the total number of hours within DA.
- Teacher - subjective characteristics: according to Section 2, the six indicators of teaching practices and the six factors of teacher beliefs.

This specification allows to particularly investigate the role of *objective* teacher characteristics and the one of *subjective* teacher characteristics.

#### 3.1 Main results

Results from the estimation of the random intercept model described in previous Section is reported in Table 1.

On the one hand, student characteristics are strongly related to the overall satisfaction rating of the DA, particularly those related to the academic experience of these students. The main features of the courses play a weak role instead.

On the other hand, there are some interesting results on the relationship between SETs and teacher characteristics. *Objective* teacher traits are weakly related with SET ratings: age is the only variable reporting a strong statistically significant estimate (the older, the better the teacher is evaluated, *ceteris paribus*). *Subjective* features of the teachers are also related to SET scores, but in some particular ways. Two indicators of *practices* and even four factors of *beliefs* are statistically significant. In particular, looking at these teacher beliefs, interesting relationships appear for those factors related to the sensitivity and the aptitude of teaching. For instance, according to the PRODID questionnaire the factor "Feeling the need of support to improve teaching activities" may highlight those teachers who feel some difficulties or inadequacies in their teaching activities/performances and for this reason they need help from experts. Students are able to perceive such difficulties and then reporting a lower evaluation of the course (other things being equal). On the contrary, students recognise those teachers with a high passion for teaching or the will to propose suitable and helpful instruments in their DAs: such traits may be able to enhance the transmission of knowledge from the teacher to the student.

It is worth noting the different relationships that come to light between SET evaluations and the *passion for teaching* and *passion for research* dimensions.

## 4 Conclusions

Exploiting the richness of information provided by an innovative survey on teaching experiences and beliefs of professors working at the University of Padua, the role of the teacher perceptions and needs on their activities is deeply investigated. Findings clearly show that *subjective* characteristics of the teachers play an important role in explaining SET ratings. However, this solution should be improved taking into account the fact that the sample of professors, who completed the PRODID questionnaire, is likely to be not randomly selected.

This work may be seen as a first step for enhancing the relationship between quality of a course (or university) and students' opinions. Indeed, teaching is a complex and multidimensional concept, so a future research strand could be the analysis of a multidimensional indicator of course quality, based on a battery of items.

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**Table 1** Estimates of the random intercept model on the students' overall satisfaction

Group characteristics	Variable	Point estimate
Course	Compulsory course	-0.036
	Number of hours	0.432 *
	More than one teacher	-0.096
	Location of courses in Padua	-0.875 *
	Shared course	-0.126
Student - general	Female	-0.030
	Age	0.304 ***
Student - career	Second year of enrolment	-0.216 ***
	Third year of enrolment	-0.140 *
	Average number of passed exams (whole career)	0.088 **
	Average grade of passed exams (in 2012/13)	0.338 ***
Teacher - general	Female	-0.169 *
	Age	-0.185 ***
Teacher - career	Full professor	0.017
	Associate professor	0.077
Teacher - DA	Proportion of hours in DA	0.231
Teacher - subjective (practices)	Practices for actively getting involved students	-0.110
	Proposal of external contributions	0.192 **
	Monitoring students learning during the course	0.003
	Assessing students learning using different types of exam	-0.194 **
	Modification of teaching practices according to SET	-0.038
Teacher - subjective (beliefs)	Reporting at least 1 activity involving technology practices	0.053
	Passion for teaching	0.128 ***
	Passion for research	-0.049
	Need of support for improving teaching activities	-0.110 ***
	Will of changing teaching activities with students needs	0.075 *
	Features of teaching and learning methods	0.137 ***
	Features of teaching and evaluation activities	-0.007
	constant	6.152 ***
	ICC	21.2%

Note: \*\*\* = 1% of level; \*\* = 5% of level; \* = 10% of level

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