

A Longitudinal Study of the Relationship between Students' Final Grade and their Evaluation of Professors' Teaching in the Next Semesters

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ABSTRACT

Student evaluation of professors is one of the common tools of universities to improve the quality of teaching in classrooms. Since in Iran's higher education system, student evaluations are used for annual promotion, contract extension or change of status, and the promotion of professors' scientific rank, the correct analysis and interpretation of the results of these evaluations is of foremost importance. This longitudinal research, which is a panel study, has analyzed the relationship between students' grades and their teacher's evaluation in the following semesters. The statistical population of the research was made up of more than 200,000 pairs of "Student's Final Grade-Teacher's Evaluation Grade" which were obtained from students studying at the University of Kashan in the conditions of face-to-face education before the pandemic. After conditioning and sifting the data, the final analysis has been done on the grades-evaluations of 3098 students during four semesters as a research sample. The regression analysis of the random effects model showed that with a one-unit increase in the final grade of the student, his/her evaluation grade of the teacher's teaching in the next semesters increases by about five percent. Additional analyzes showed that the grade can create a special mental attitude in the student, which can affect the student's evaluation of the professor even three semesters later. It seems that university administrators, educational councils, and university admissions boards should revise the guidelines for calculating and interpreting data from student evaluations, taking into account the various consequences of grade inflation at the university level.

Keywords: higher education, student evaluation of teaching, quality of teaching, professor evaluation, academic achievement.



Introduction

In most higher education systems, student evaluation of professors is considered one of the strategies to improve the quality of teaching and learning (Marshall, 2022; Lakeman & et al, 2021; Zibaei & Kamaran, 2012; Danielson & McGreal, 2000; Radmacher & Martin, 2001). The data obtained from the evaluation of students also have special usages for the professional career of university teachers (Berezvai, Lukats & Molontay, 2020). Although there are concerns about the validity of these evaluations, they are often cited when making decisions about contract renewal, changing to tenure, and academic promotion (Linse, 2017). This is despite the fact that professors have concerns about how to use and interpret their results, regardless of the ambiguities related to how to implement these evaluations (Ziaee, Miri, Haji-abadi, Azarkar & Eshbak, 2006; Dargahi & Mohammadzadeh, 2013; Boysen, Kelly, Raesly & Casner, 2014). The goals of student evaluation of professors are summarized in three basic dimensions: 1) providing diagnostic feedback to professors to improve education; 2) personnel decisions such as changing to tenure and promotion; and 3) helping students choose courses (Schmelkin, Spencer & Gellman, 1997). The fourth function is mentioned under the title of using evaluations to improve research in the field of teaching and learning (Marsh & Roche, 1993). The results of classic researches of the seventies and eighties showed the reliability and validity of student evaluations (Marsh, 1977, 1982). But over time, major accusations were made to the evaluations, including that they do not have reliability and validity; they are highly correlated with grades, they are not so popular, and they are influenced by factors such as course characteristics, class size, course level, whether the course is compulsory or optional, and class time during the day. Also, these evaluations are influenced by the characteristics of the professors and the characteristics of the students themselves (Schmelkin, Spencer & Gellman, 1997; Basirat, Motevasseli, Mirfarhadi & Taheri, 2019). On the other hand, the role of the characteristics of the educational institution and the quality of its educational services on the teachers' teaching method has also been clarified (Galavandi, Ghalee & Beheshtirad, 2014). Considering the totality of these evidences, it can be claimed that important factors affect the results of student evaluations, many of which universities can manage. The important point is that university administrators should not assume that these biases do not have harmful consequences or that their negative effects are not significant. The fact is that these biases have different effects on the working style of professors. For example, professors expect students to understand the importance of the lesson and this appreciation is reflected in their evaluation of the lesson.

But in fact, students' evaluation of professors has nothing to do with the level of students' commitment to the subject and course (Beran & Violato, 2009). And it is more a reflection of students' perceptions about the degree of difficulty of the course (Addison, Best & Warrington, 2006). The fact is that professors understand these conflicts wholeheartedly. At first, they make changes in their teaching style based on student evaluations. But it is not always a positive result. One of the reasons is that many evaluation forms do not provide useful feedback to the instructor (Marshall, 2009). Maybe that's why some professors learn to ignore student evaluations over time! One of the factors influencing the biases is the approach of the professors to measure the learning and determine the final grade of the students. From an educational point of view, the "grade" should be a reflection of the students' academic abilities and real learning at the end of the educational course. In practice, however, when evaluating and determining the final grade of students, teachers give points to dimensions other than learning (such as the amount of effort, the amount of progress, the completion and delivery of work, participation, the amount of attention in the class, and to some extent the student's personality and behaviors). Apart from this, their grading is different for people in each course or level of education and even within the same class (Brookhart, 2016). The logical and natural consequence of paying attention to the differences is that students gradually realize this issue. Just as professors are sensitive about the unfair reduction of their evaluations, students also have perceptions, albeit intuitive, of the reasons for the drop or growth of their grades. But there is an important psychological issue here. According to the attribution theory (Nevid, 2018), students who have "external documents" look for the cause of their grade reduction in external factors. In such a situation, the mental attitude of the student will affect his evaluation of the teacher's teaching. It is even possible that in the course of the semester, the student will interpret and understand the behavior and actions of the professor according to his previous intention. Taking into account variables such as academic failure, probation and the lack of students' relationship with the lessons that are currently experienced in university classrooms and based on the theory of documents, it is likely that students attribute the reason for their grade drop to the professor or the professor's teaching. It is natural that if such a situation occurs, if the student's grade is lower than her expected level, she may turn to situational attribution and evaluate the teacher's teaching as weaker. Now, the current

longitudinal research design can be interpreted as evidence to confirm or reject the recent hypothesis. Specifically, the question is how much the student's grade received in the previous semester can predict his evaluation of the professor in the coming semesters?

Methodology

The present longitudinal research is a panel study. In a panel study, "the same people are studied over time and at successive points" (Johnson & Christensen, 2016, p 841). The statistical population of the current research is made up of all the students studying at Kashan University in four semesters of face-to-face education before the Corona situation and virtual education. Due to the fact that each student has an average of more than fifteen units per semester, the main data file or the statistical community contained 220,000 lines. The condition of selecting people in the research sample was defined as if the student had studied with a certain professor in four consecutive semesters. The required sample size was estimated by performing the main analysis with GPower software. Considering that the data was a longitudinal panel type and to determine the effect of the student's grade in each semester, the use of multi-level mixed effects models was necessary, so the multiple regression test was chosen as the statistical analysis method. The effect size of the independent variable (student grade) was considered to be 0.02, the alpha level was 0.01, the power of the statistical test was 0.99, and the number of predictor variables was 5. The software estimated sample was 1683 subjects. After betting, initial screening and removing the lines that even one of the basic cells was missing, a sample of 3098 people was obtained, which fortunately was much more than the minimum estimated volume of the software. The tool of data collection in this research was the official evaluation form of students from professors in the span of four semesters, which was implemented in seventeen items on a nine-point scale (from 12 to 20) along with the option "I have no opinion" in all faculties.

Findings

Does the grade that a student receives from a professor in one semester affect her evaluation of the professor's teaching quality in the following semester or semesters? To conduct the test, the necessary structuring was done first and the data was made into a panel. Then, the regression of the random effects model was implemented in the Stata software environment. Students' evaluation scores from professors were considered as dependent variables and other variables as independent variables. The result of this analysis is presented in table number 1.

Table 1

Mixed-Effects Model for predicting students' evaluation of teaching

Independent s	Coef.	Std. Err.	z	P> z	[95% Conf. Interval]	
Class Size	-0.025	0.003	-6.95	0.000	-0.032	-0.018
Class Mean	-0.017	0.022	-0.79	0.428	-0.061	0.025
Fails	-0.001	0.012	-0.01	0.991	-0.024	0.024
Student Grade	0.052	0.005	9.52	0.000	0.041	0.063
Cons	18.70	0.340	91.91	0.000	18.03	19.36

The regression coefficient of "Student's grade" shows that by a unit increase in the student's final semester grade, the professor's evaluation grade in the next semester increases by 5.2%. Based on this, with a one-unit increase in the student's end-semester grade, it can be said with 99% confidence that based on the nine-grade evaluation form, there has been an increase of 0.12 in the student's evaluation grade from the professor in the following semesters.

Conclusion

Evaluation experts in higher education warn that student evaluations should not be mentioned as the main motivation and incentive for professors to try harder to improve the quality of education (Antoci, Brunetti, Sacco & Sodini, 2021). Meanwhile, in Iranian universities, "teaching quality scores", an important part of which is related to student evaluations, have become the



main tool and lever for improving education. The findings of the current research, which have been obtained from the review and analysis of the data of four consecutive semesters, show a clear relationship between the student's grade in each semester and her evaluation of the professor's teaching in the following semester. In total, four regression coefficients were obtained as four findings and independent research evidence, all of which indicate the existence of a significant relationship between the student's grade and her evaluation by the professor. The first finding and the general result is that after controlling the effect of the differences between the panels (semesters), it can be claimed that by a unit increase in the student's final grade, his evaluation of the professor in the next semester increases by more than five percent. The second finding is that with an increase of one unit in the student's final grade in the second semester of 2015, after two semesters, there has been an increase of 0.287 units in the evaluation score of the student from the professor in the second semester of 2016. The third finding is that with an increase of one unit in the student's final grade in the first half of 2016, after two semesters, there has been an increase of 0.304 units in the evaluation score of the student from the professor in the first half of 2017. The fourth finding and the most fundamental result is that after controlling the interaction effect of the student's grade and the level of academic achievement of the whole class, a significant regression coefficient of 0.132 is still observed, which well shows the mental attitude resulting from the student's grade at the end of the second semester of 2015. After three semesters, it still affects the student's evaluation of the professor. It is not unlikely that some lecturers will realize the existence of this relationship based on experience and consciously or unconsciously, in order to increase the satisfaction of the institution or the students, consider higher grades for the students. In such a situation, the inflation of grades in the institute does not indicate the increase of students' learning, but rather a hidden transaction in the course of education. Among the few researches with a detailed research plan that have dealt with the relationship between the grade, the student's personal bias and his evaluation of the professor, we can refer to the research of Park and Cho (2022) who found that weak students give lower grades to the professor in evaluations. These researchers have concluded that if, for some reason, students feel a gap or difference between their ideal grade and their actual grade, they will punish or reward the professor. Of course, these researchers have reported that in the case of a positive difference or score inflation, the reward will decrease, but the punishment will not decrease. In the supplementary explanation of the main finding of the current research, it will be enlightening to refer to Marshall's new findings (Marshall, 2022). From the analysis of the positive and negative semantic load of the students' qualitative comments, this researcher came to the conclusion that these comments have a significant correlation with the result of the student's quantitative evaluation of the professor. This finding is important from the point of view that it shows that the student evaluates the professor based on the special positive or negative impression he has of him. As the analysis of the present article also showed, the probable explanation is that the positive or negative perception of the student, which is derived from his high or low grade, remains constant over time, and therefore affects his evaluation of the professor even after several semesters.

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