Teaching quantitative methods for sociological research

The contribution of peer assessment as a teaching strategy

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1. RESUM:

Describimos nuestra experiencia y resultados tras implementar el trabajo en grupo y la coevaluación como estrategias en la enseñanza de métodos cuantitativos para la investigación sociológica en el Máster en Dirección de Entidades Deportivas de la Universidad de Barcelona. Estas estrategias son bien recibidas por los alumnos y les ayudan en su aprendizaje. La coevaluación puede combinarse fácilmente con el trabajo en

grupo, en forma de actividad individual, que sustituya al examen final.

2. ABSTRACT:

We describe our experience and results after implementing teamwork and peer assessment for teaching quantitative methods applied to sociological research in the Sport Business Management Master (SBMM) of the University of Barcelona. These strategies are always well-received by students and help them in their learning process. Peer assessment can be easily combined with teamwork and it can be used as an individual activity instead of a final exam.

3. PARAULES CLAU: 4-6

Teamwork; peer assessment; survey design; sociology; statistics

4. KEYWORDS: 4-6

Trabajo en equipo; coevaluación; diseño de encuestas; sociología; estadística

5. DESENVOLUPAMENT:

Each year approximately 25 students start the Sport Business Management Master (SBMM, an official master's programme of the University of Barcelona), and all of them enrol in the subject Quantitative Methods Applied to Sociological Research (QMASR), which is compulsory. From the beginning, we realised that it was advisable to adopt innovative techniques in the subject to facilitate the students' engagement in active learning. Our students are very heterogeneous in terms of their previous studies, some students have a poor knowledge of statistics and sociology while others have a more comprehensive background. Additionally, some are poorly motivated to study sociology and statistics, because they do not see how the subjects are going to be useful to them in the future. Moreover, students are also heterogeneous in terms of nationality, and sometimes the degrees from different countries are not equivalent.

In this context, the introduction of innovative techniques in university teaching helps to increase students' motivation and encourage their engagement in active learning. Deslauriers, Schelew and Wieman (2011) show that even when the master class is taught by a highly regarded and expert lecturer, the students' benefits in terms of learning are

lower than in a more interactive context, even if the lecturer in the latter case is a post-doctoral student with far less teaching experience. In the same context, Baepler (2014) shows that lecture time can be reduced through the introduction of active learning sessions without having a negative impact on student results.

In our context we propose to use three teaching strategies: teamwork, peer assessment and double revision of assignments. We are inspired by team-based learning as a leading active learning methodology, where master classes play a minor role and they are substituted by activities devoted to interactions between small groups of students. Teamwork reinforce not only their knowledge and learning processes (Opdecam, Everaert and Van Keer, 2014; Shah, 2013), but also their interpersonal communication skills. Regarding peer assessment, evidence shows that it contributes to increasing the participation and autonomy of students, as well as their responsibility towards their own learning process. There are evidences of the positive effects of peer assessment, namely, it increases motivation and engagement (Gatfield, 1999; Paswan and Gollakota, 2004), contributes to improving the students' understanding, control and autonomy of their learning process, and it also improves their critical analysis capability (Topping, 2009). Finally, the third strategy that we apply is double revision of assignments, which consist on giving the students the opportunity to correct the assignments that they submit according to the feed-back received from the teacher and classmates, and re-submit them. This is a formative evaluation strategy that has been proved to help students in their learning process (Alcañiz et al., 2015).

Now, we describe the context of the subject QMARS. It is taught in the first semester for 3 hours/week over four months. It is organised in two parts: Sociology (Part I) and Quantitative Research Methods (Part II). These two parts are taught by two different lecturers, one being a sociologist who teaches 1.5 hours/week of sociology and the other one being a statistician who teaches 1.5 hours/week of quantitative research methods. The content of the subject is focused on the survey as a research technique in the social sciences. There are a few master classes in each part that seek to present the theory necessary to apply the survey as a research method in sociology. Once the theory is presented, the students are organised in groups of 4 or 5 and each group must carry out a complete survey-based sociological study. The topic of the research (related to the sociology of sport) is chosen by each group. Each team is asked to complete all the stages of a sociological study using a survey as a research technique (research project,

questionnaire design, data analysis and presentation of the final report). Once the subject of their research has been chosen, each group must write and submit the following three assignments:

- Research project (*assignment 1*): It consist of an introduction to the sociological topic, motivation, objectives and sample design of the survey (25% of the final mark)
- Questionnaire design (*assignment 2*): Students design the questionnaire that the individuals must answer (25% of the final mark)
- Data analysis and presentation of the final report (*assignment 3*): A sociological database based on a survey is provided to students. Each group must do the data analysis of a specific part of the data set. Finally, each group must write and submit a final report and do a public presentation. The data analysis represents 12.5% of the final mark (it is done in groups) and the oral presentation represents 6.25% (and the lecturers give an individual mark to each student).

Additionally, there is a final exam, which is 25% of the final grade. The remaining 6.25% comes from the peer-assessment activities, which are carried out after the submission of each assignment. Then, each student has to evaluate the assignment submitted by another group and receives from the lecturer a grade on his performance as evaluator. We must say that we formally marked and considered peer assessment in the grades for the first time in the last academic year (2016-2017). At the same time, each group receives the comments and evaluation from the students acting as evaluators, and also from the lecturer, and they are asked to submit a revised version of the assignment. We introduced peer assessment as a teaching strategy in this subject, as any authors have stressed that it improves student motivation, contributes to improving the students' understanding, control and autonomy of their learning process and in their professional activity, and increases their critical analysis capability (Topping, 2009, p.20; Van der Berg *et al*., 2007, p.34, Planas *et al*., 2012, p.18).

The main objective of our strategy is to increase students' motivation for learning quantitative methods for sociological research by using innovative techniques that facilitate their engagement in active learning. In this sense, it is essential to analyse the feedback from our students (on the innovation techniques) and also their final grades. Additionally, we investigate the relationship between their performance in individual

activities vs. group activities. In order to do so, we analyse the grades of our students in each part of the evaluation system and calculate the correlations among them.

Here we describe the results of the grades obtained by students in the 2016-2017 academic year in each part of the evaluation system. Additionally, we show the results of a questionnaire completed by students on their peer-assessment experience. We asked students about the extent to which they agreed with a number of statements about the peer-assessment experience (developing critical capacity, motivation to study, subjectivity of the co-evaluators, etc.). The questionnaire was completed by 20 students. Figures 1 and 2 show the summary of the results.

The statement with the highest average score (where 1 = *totally disagree*, 2 = *mostly disagree*, 3 = *mostly agree* and 4 = *totally agree*) is Q2 (peer assessment helped me to learn from my own and others' mistakes): 50% of respondents mostly agree with this statement and 50% totally agree. The statement with the second highest average score is Q3 (evaluators were less critical of the assignments than the lecturer), but none totally disagrees with the statement. Next, Q1 (peer assessment helped me to develop my critical capacity) and Q4 (evaluators were more subjective in the evaluation of my assignments than the lecturer) have almost the same average score, with one student responding that they totally disagreed with the corresponding statements. It is relevant to note that 80% of students mostly or totally agreed with statement Q1. Finally, the statement with the lowest average score is Q5 (peer assessment is a motivation to study the contents of the subject in more detail).

Figure 2 shows the descriptive statistics for the grades in the subject, while Figure 3 shows the correlation coefficients among the grades. The peer-assessment grade can be understood to some extent as a rating of a student's critical capacity. We see that our students, on average, obtained 6.45/10, which means that they have a medium/high critical capacity. The standard deviation is 2.54, the minimum mark is 1/10 and the maximum is 9/10, so there are quite extreme marks among individuals. We also see that the peer-assessment grade is positively correlated with the exam grade, and the correlation is highly significant. This means that those who have a higher critical capacity also had a higher performance on the final exam. This result allows us to conclude that the individual grades on peer-assessment activities could be used to distinguish between higher and lower performing students and, moreover, we could consider using peer

assessment instead of the final exam in subsequent years. We also observe that the peer-assessment grade is positively correlated with the questionnaire grade (*assignment 2*) and the oral presentation grade, but these correlations are significant at the 10% significance level. Further, we see that the project (*assignment 1*) is the assignment with the highest average grades and the most homogeneous ones (all projects had a grade higher than or equal to 5/10), while the worse results were obtained in the exam. The correlation between the exam grade and the oral presentation grade is significant and positive. The correlation is also positive and significant between the project and the questionnaire (*assignment 2*), between the project and the report (*assignment 3*) and, finally, between the questionnaire and the report (*assignments 2* and *3*, respectively). In other words, the three assignments done by the students in groups are positively and significantly correlated among themselves. The correlation between peer assessment and oral presentation (also individual assignments) is also positive and significantly correlated at a lower significance level. We conclude that in subjects where the evaluation system is based on teamwork activities, it is extremely important to assess the individual performance of each member correctly and to provide tools to help the lecturer in that respect.

In summary, we have described our experience of teaching quantitative methods for sociological research in business masters programmes over many years, during which we have gradually introduced relevant innovation strategies to address problems arising from students' lack of motivation and their heterogeneous backgrounds, among other factors. Specifically, we have introduced teamwork, peer assessment and the double revision of assignments. When analysing the grades obtained by our students in the last academic year (2016-2017), we observed a significant positive correlation first among teamwork activities and second among individual activities. In particular, we observed a high correlation between the grades in the peer-assessment activities and the grades in the final exam. This result allows us to conclude that, in subsequent years, peer-assessment activities could be used instead of the final exam to distinguish between higher and lower performing students.

It is not easy to evaluate how effective our experience has been, because it has been applied to a small group of students, approximately 25 each year, and because we have implemented changes and introduced new strategies in our teaching method and evaluation system almost every year. We must say that all of these changes have always been well-received by students, and our conclusion from their feedback, based on their

responses, is that the changes have contributed to bringing statistics and sociology closer to them and increasing their motivation. In subsequent years, we plan to consolidate the teaching strategies currently applied in the context of this subject and to carry out a formal evaluation of these strategies. Specifically, we want to measure whether there is any correlation between the acquisition of individual critical capacity and team activities. Of course, we are open to introducing additional innovation strategies that could help students in their process of learning quantitative methods for sociological research.

5.1. FIGURA O IMATGE 1

Figure 1. Results of questionnaire responses

	Mean	Standard deviation	Minimum	Maximum
Q1: Developing one's critical capacity	2.85	0.67	1	4
Q2: Learning from one's own and others' mistakes	3.50	0.51	3	4
Q3: Evaluators were less critical than the lecturer	3.05	0.76	2	4
Q4: Evaluators were more subjective than the lecturer	2.80	0.77	1	4
Q5: Evaluation as motivation to study	2.60	0.94	1	4

Source: own elaboration

5.2. FIGURA O IMATGE 2

Figure 2. Descriptive statistics of the grades

	Mean	Standard deviation	Minimum	Maximum
Peer-assessment/Coevaluation	6.45	2.54	1	9
Exam	5.59	2.33	0	8.9
Assignment 1-Project	7.09	1.51	5	9
Assignment 2-Questionnaire	6.52	1.64	3.5	8
Assignment 3-Final report	6.45	2.54	1	9
Oral presentation	6.75	2.41	0	9
Final score	6.38	1.24	3.9	8.3

Source: own elaboration.

FIGURA O IMATGE 3

Figure 3. Pearson correlation coefficients among grades. * significant coefficient at 5% confidence level, ** significant coefficient at 10% level.

	Peer assessment	Exam	Assignment 1-Project	Assignment 2-Questionnaire	Assignment 3-Final report	Oral presentation
Peer assessment (ind)	1	0.65**	0.21	0.40*	0.35	0.38*
Exam (ind)		1	-0.25	-0.02	0.07	0.50**
Assignment 1-Project (team)			1	0.82**	0.60**	0.08
Assignment 2-Questionnaire (team)				1	0.83**	0.21
Assignment 3-Final report (team)					1	0.11
Oral presentation (ind)						1

(ind): indicates individual assignment.

(team): indicates team assignment

Source: own elaboration.

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