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The evaluation of learning: a case study on continuous assessment and academic achievement

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Abstract

The aim of this paper is to analyse how continuous assessment of learning affected academic achievement in university students over the last decade. It focuses on the case of World Economic History, a compulsory subject in the Faculty of Economics and Business at the University of Barcelona. The paper provides new quantitative and qualitative evidence on the issue, and, unlike other studies, takes a long-term perspective to enrich the analysis of assessment methods and academic achievement.

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Keywords: learning assessment; continuous assessment; academic achievement; long-term perspective; economic history.

1. Introduction and objectives

During the establishment of the European Higher Education Area (EHEA), new teaching methods have been developed and implemented. Probably one of the most important of these is the continuous assessment of knowledge and skills (Delgado & Oliver, 2006, among others). But how does the type of assessment used affect students' academic achievement? The main objective of this paper is to provide quantitative and qualitative evidence of the relation between the continuous assessment system and university students' grades. It is not the first study on this topic. However, it is probably the first (at least in Spain) to focus on World Economic History: a compulsory subject in the first year of Economics and Business Administration and Management degrees at the University of

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Barcelona's Faculty of Economics and Business. Unlike other studies, we adopted a long-term analytical perspective, as we used data from academic year 2003-2004 to 2012-2013.

The rest of the paper is organized as follows. Section 2 describes the method, compares students' final grades according to the type of assessment and, finally, relates the results obtained in continuous assessment tests to the methodology used. Section 3 describes the main conclusions of the study, which indicate that continuous evaluation helps to significantly improve students' academic achievement. However, the mechanisms underlying this improvement appear to be more complex than perhaps could have been expected.

2. Method and results

In Spanish universities, continuous assessment has become standard practice since the establishment of the European Higher Education Area (EHEA). For example, at the University of Barcelona (UB) the new Regulations governing course plans for subjects and the assessment and marking of learning outcomes, which were approved in 2012, state that "as a general rule, assessment should be continuous and completed within the established teaching period for the subject, in accordance with the sequence of the curriculum and the general academic calendar approved by the University" (<http://www.ub.edu/acad/noracad/avaluacio.pdf>).

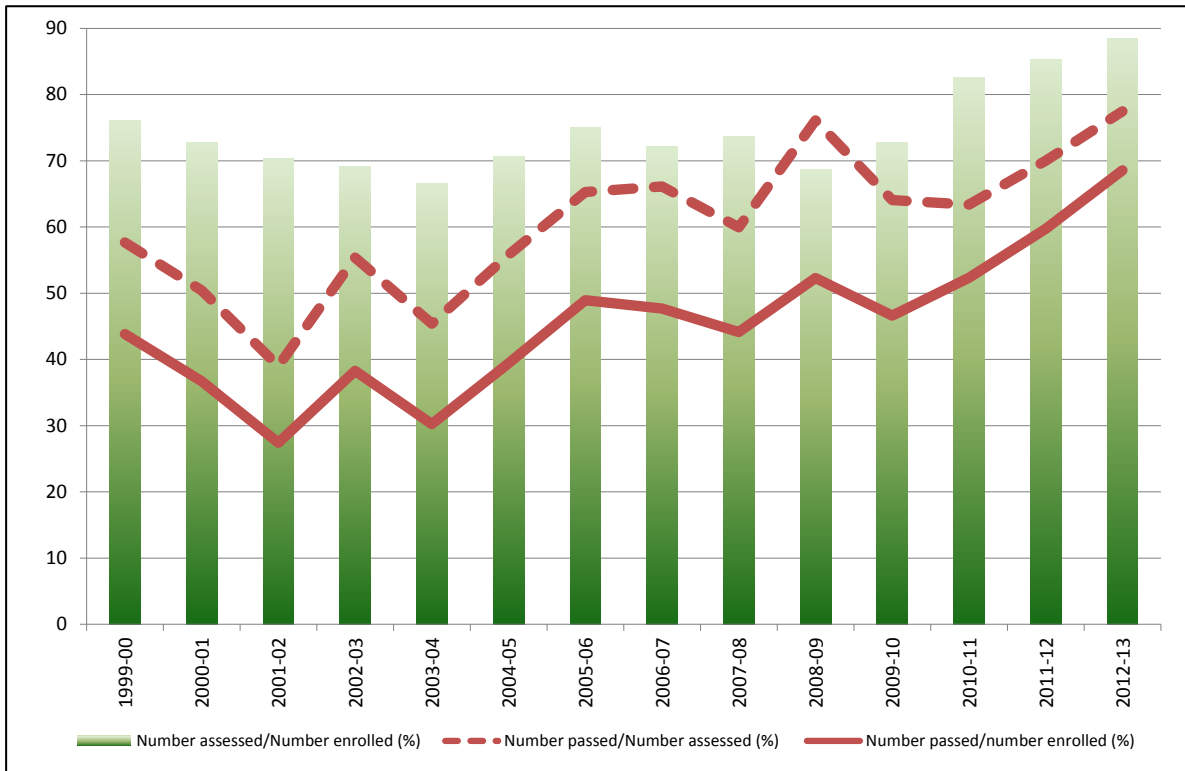
However, the fact that continuous assessment is now standard does not mean it is new. At the beginning of the twenty-first century, the system was already used in teaching at the UB's Department of Economic History and Institutions. Students who took the subject "World Economic History" could attend practical classes and, through them, participate in a continuous assessment process. Alternatively, students could choose single assessment. The former obtained (and still obtain) 40% of the final grade during the continuous assessment process and the remaining 60% in the final examination. The latter only took a final examination, which was (and still is) equivalent to 100% of the final grade.

Table 1. The database: academic years, groups and number of students for whom information on grades is available.

Academic year	Number of groups	Number of students
2003-2004	1	162
2004-2005	--	--
2005-2006	6	737
2006-2007	3	468
2007-2008	4	486
2008-2009	6	745
2009-2010	2	131
2010-2011	7	536
2011-2012	6	737
2012-2013*	4	417
TOTAL	39	4,419

Notes and Sources: *First semester. Database created as part of the project "Continuous assessment, academic achievement and proposals for teaching improvement: the case of World Economic History" (University of Barcelona).

The implementation of a continuous assessment system has generated a considerable amount of data on students' grades and the type of assessment. We used this to construct a database that covers academic year 2003-2004 to the first semester of academic year 2012-2013, with information on almost 40 groups and over 4,400 students (Table 1). The task of data processing was laborious and some problems arose, as is generally the case. For example, the available data were not broken down to a sufficient level, and there were some homogeneity issues. However, the number of final observations for which full information was available was quite high, at around half the total number of groups and students listed in Table 1.



Notes and Sources: Success rate=(number passed/number assessed)x100. Achievement rate=(number passed/number enrolled)x100. Compiled by author from Universitat de Barcelona. Unitat de Planificació Acadèmicodocent.

Fig. 1. Success and academic achievement rates for the subject “World Economic History”, Business Administration and Management degree, 1999-2000/2012-2013 (percentages)

Can continuous evaluation significantly improve students’ academic achievement? To answer this question, we must first examine changes in academic achievement in the subject “World Economic History”. Fig. 1 shows the percentage of students who passed the subject in the first examination period, in relation to either the number of students assessed (success rate) or the total number of students enrolled (achievement rate). The data are for academic years 1999-2000 to 2012-2013 and summarize the information available on all students enrolled for the current degree in Business Administration and Management, which is the degree course with the most students at the University of Barcelona’s Faculty of Economics and Business. The figure shows a very important aspect: academic achievement increased sharply during the study period. In the long-term, the introduction of continuous assessment has also contributed to a drop in the number of enrolled students who do not sit the exams to be assessed.

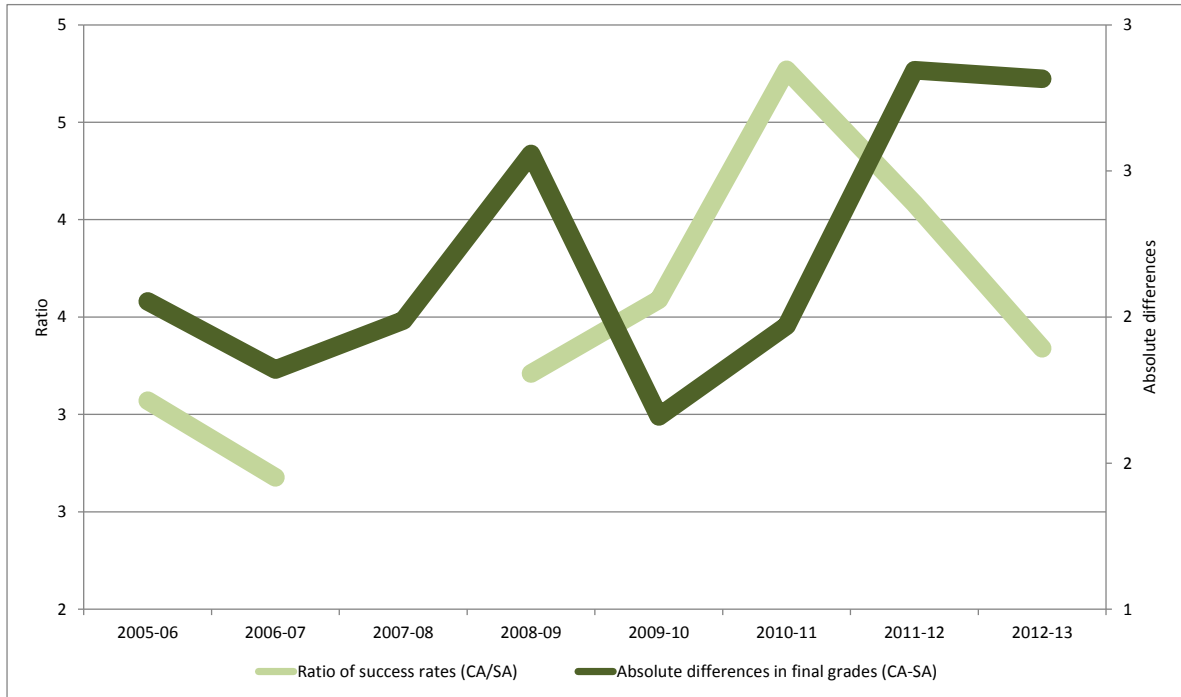
Table 2. Success rates and final grades for “World Economic History” by type of assessment, 2005-2006/2012-2013.

	Number of observations	Continuous assessment (CA)	Single assessment (SA)	Difference (CA)-(SA)	Ratio (CA)/(SA)
Success rate	1,966	61.9 %	17.9 %	43.9	3.5
Average mark (out of ten)	2,267	5.5	3.3	2.2	1.7

Notes and Sources: All the data refer to students who were assessed in the first examination period. See Table 1

An analysis of the success rates and grades of continuous assessment students and students who chose the single assessment option provides further clarification (Table 2). It also reveals one clearly important fact: between the 2005-2006 and 2012-2013 academic years, the success rate of students who were continuously assessed was much

higher than that of students who chose single assessment. In a sample of around 2,000 students' grades for the Economics and Business Administration and Management degrees, the success rate of continuous assessment students was above 60%. In contrast, the success rate of students who chose single assessment was just below 18%. Clearly, these are considerable differences, but they are only slightly greater than those found in other studies (Arribas, 2012). If we look at the final grade rather than the success rate, the conclusions are very similar. The average mark for a student who was continuously assessed during the study period was 5.5 points (out of ten). This is 2.2 points higher and a grade 70% above that which would have been obtained using a different assessment system.

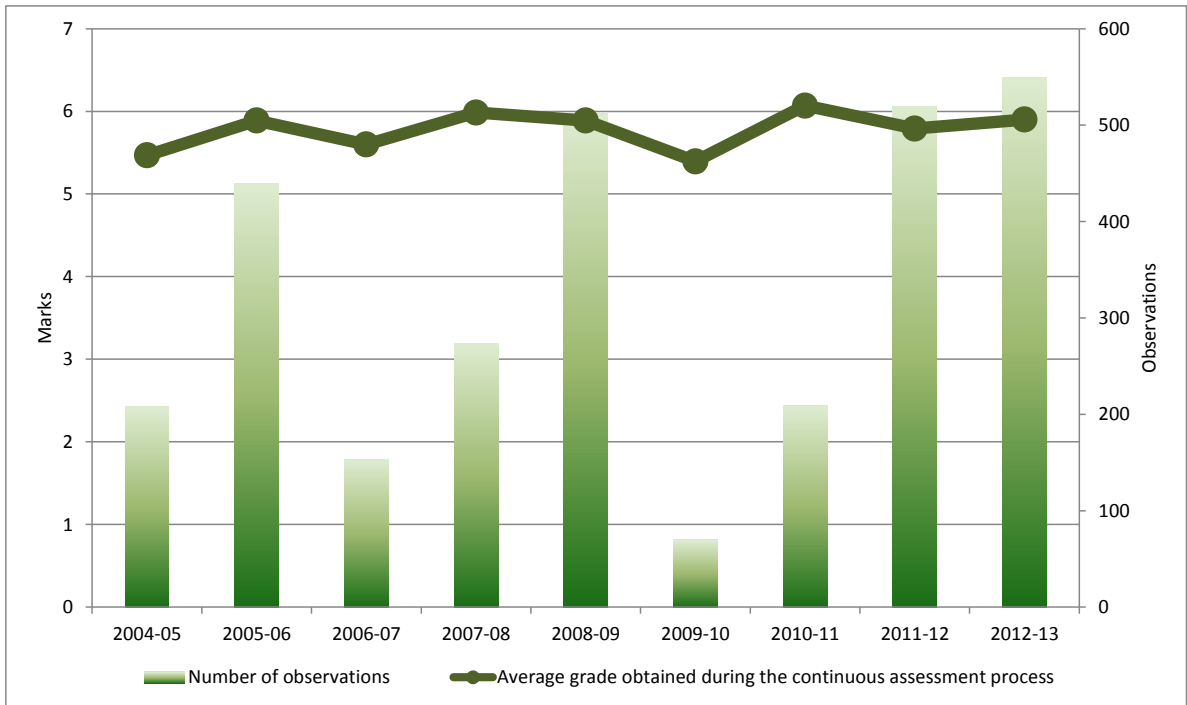


Notes and Sources: CA=continuous assessment, SA=single assessment. See Table 1.

Fig. 2. Ratio of success rates and differences in the final grade by type of assessment, 2005-2006/2012-2013

Clearly, the differences described above did not remain constant over time. This is shown by the two types of indicators in Fig. 2. The first is the ratio of success rates for the subject, that is, the result of dividing the success rate of continuous evaluation students by that of students who chose single assessment. The second indicator is the difference (in points) in the final grades of continuous assessment and single assessment students.

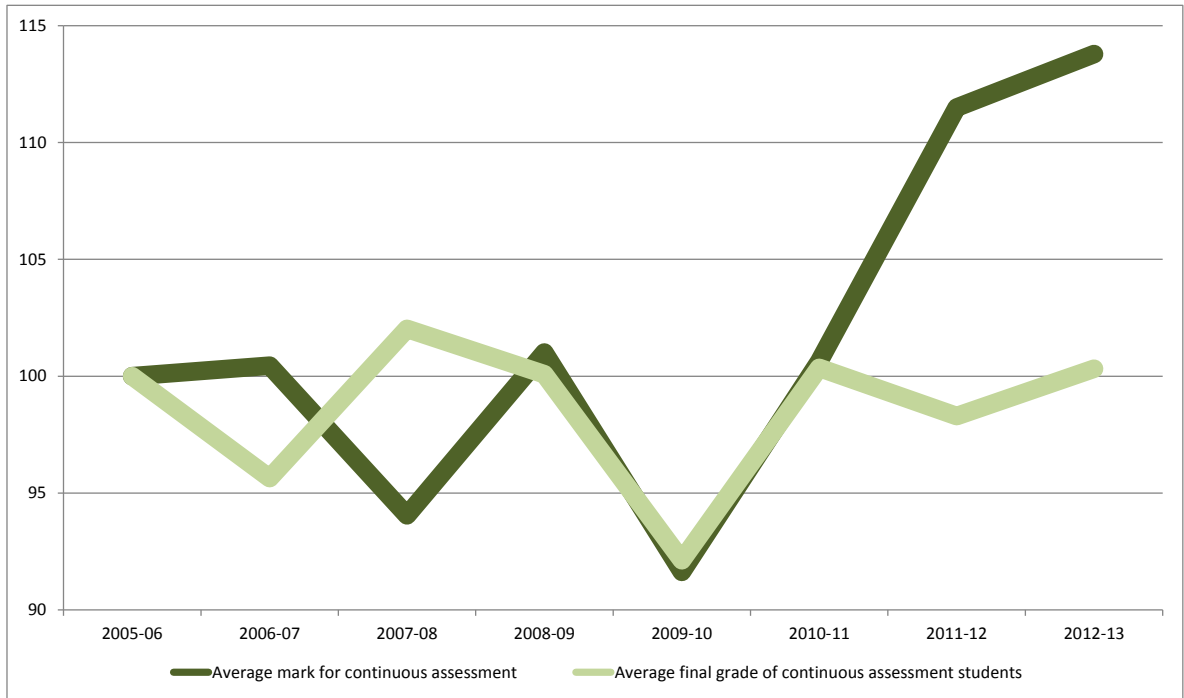
The data reveal two interesting aspects. The first is that the ratio of success rates and the difference in average grades fluctuated widely throughout the study period. This was probably related to the different characteristics of the groups and tenured university lecturers in the sample. For example, in academic year 2009-2010, the ratio of success rates was 3.6, but in 2010-2011 it was 4.8. In other words, in the first of these academic years, the success rate of continuously evaluated students was over three times that of students who chose single assessment, whilst in academic year 2010-2011, the success rate of continuous assessment students was almost five times higher. The same situation is found if we compare the grades obtained in academic years 2008-2009 to 2009-2010, and 2010-2011 to 2011-2012.



Notes and Sources: The highest mark is 10. The marks obtained during continuous assessment count for 40% of the final grade. See Table 1.

Fig. 3. Marks obtained for tests and exercises completed during the continuous assessment process, 2004-2005 /2012-2013

The second notable aspect of Fig. 2 is the increasing distance between continuous assessment students and those who chose single assessment. The divergence in the differences in average grades was particularly pronounced. Unfortunately, we do not have a reasoned explanation of this trend. We can state that from academic year 2009-2010, the average final grade of continuous assessment students improved more than that of students who chose single assessment. In comparison to previous years, the grade of continuous assessment students increased 12% in the last three academic years (from 5.3 to almost 6.0 points), whereas that of single assessment students rose just under 2% (from 3.3 to 3.4 points). However, the improvement in the average final grade of continuous assessment students does not appear to be associated with an improvement in the results for the tests and exercises carried out in practical classes during the academic year, which count for 40% of the final grade for the subject. This is a conclusion we could draw from the data available on the marks of continuous assessment students for academic year 2004-2005 to 2012-2013 (Fig. 3).

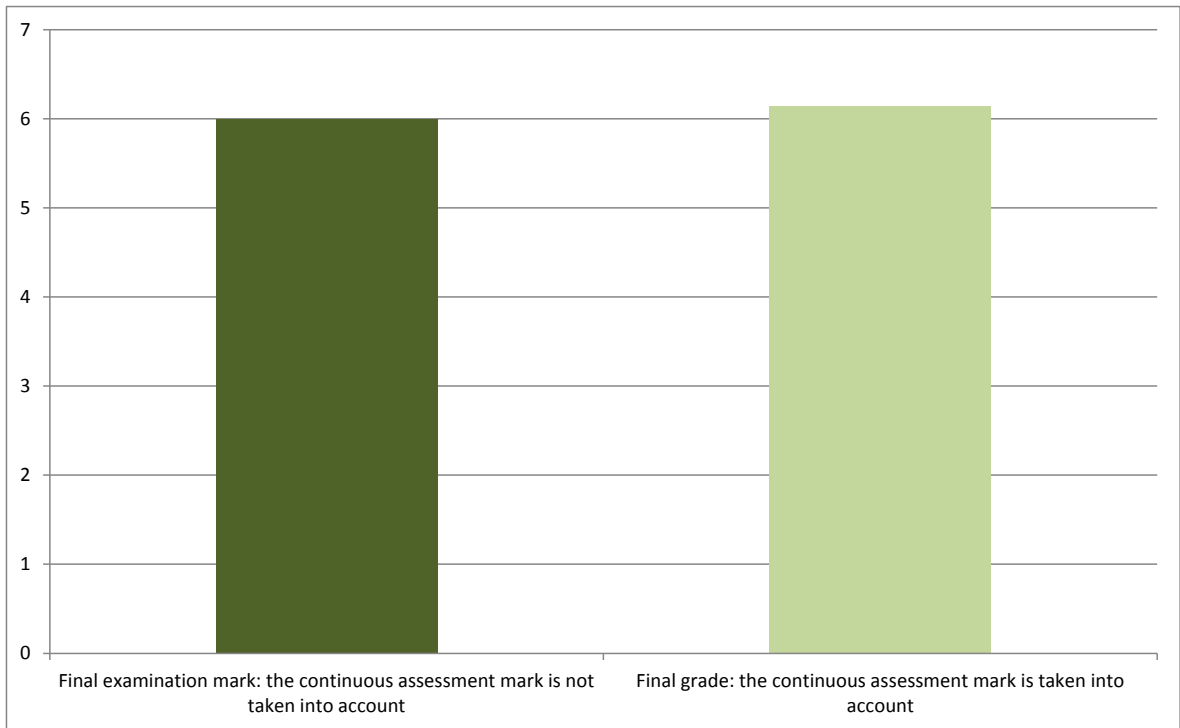


Notes and Sources: The marks obtained during continuous assessment count for 40% of the final grade. See Table 1.

Fig. 4. Continuous assessment marks and continuous assessment students’ final grades for “World Economic History”, 2005-2006 /2012-2013

In fact, students’ marks for tests and exercises completed during the continuous assessment process did not change substantially over the last decade. There was a slight increasing trend, but the differences were extremely small: between the periods 2005-2006/2009-2010 and 2010-2011/2012-2013, the average mark increased by under 0.3 points. This represents a rise of approximately 3% between one period and the next. The increase was minimal compared to that observed for the final grades of continuous assessment students (Fig. 4). In general, the average mark for continuous assessment tests and exercises fluctuated around 5.8 points out of 10, with a maximum deviation of 0.4 during academic year 2009-2010, which was the year in which there were the fewest observations.

These results should be treated with caution, as they may have been influenced by various factors. For example, the size and representativeness of the sample varied over time. The average marks for continuous assessment could have been affected by the change in continuous assessment regulations for the subject “World Economic History”. The new regulations were applied in the last few academic years and could have led to lower marks. Despite these factors, it appears that the general conclusion of a lack of change in continuous assessment marks would not have varied significantly if we had had more information available and the data had been more homogeneous.



Notes and Sources: See text and Table 1.

Fig. 5. Continuous assessment students’ final examination marks and final grades for World Economic History, 2011-2012 /2012-2013

A comparison between continuous assessment students’ final examination mark (which does not take into account the continuous assessment mark) and their final grade (which takes into account the continuous assessment mark) reveals another important aspect (Fig. 5). The continuous assessment mark does not seem to have a great direct impact on the final grade for the subject. This can be deduced from the results of a sample of 700 students from academic years 2011-2012 and 2012-2013. In this sample, the students’ average mark for the final examination was 6.0 points (out of a maximum of 10 points). The final examination mark counts for 60% of the final grade for the subject, whilst the remaining 40% is obtained from the continuous assessment process, as described above. When the continuous assessment mark was taken into account, the students’ average grade was 6.1 points, which was almost exactly the same as the final examination mark.

Table 3. Students’ marks for World Economic History, by type of test and exercise completed during continuous evaluation, 2010-2011/2012-2013.

	Number of observations	Average score (out of 10)	Average score (individual tests = 100)
Individual written exams and tests completed during PC*	2,163	5.4	100
Group written exams and tests completed during and/or after PC	239	6.9	127
Optional individual written assignments completed outside the classroom	12	8.8	162
Compulsory individual written assignments completed outside the classroom	80	6.1	113
Group written exercises completed during TC	96	6.8	126
Group oral presentations completed during PC	56	7.4	137
Total**	2,646	5.7	103

Notes and Sources: PC: Practical classes or group tutorials. TC: theoretical classes. (*) In some cases, the marks are not just for individual exams, as a percentage (less than 20%) of the mark is for group tests. (**) The mark is a weighted average. See also Table 1 and text.

The conclusions seem to be clear: continuous assessment helped to improve academic achievement. However, the improvement does not appear to have been a direct result of higher marks for the tests and exercises completed during continuous evaluation. The increase in continuous assessment marks over the last decade was not substantial; it was lower than the increase in final grades for the subject. Therefore, there must be a different relationship between continuous assessment and academic achievement. As several studies have indicated, continuous assessment promotes the gradual assimilation of course contents. It enables greater interrelation with lecturers and increases students' awareness during the learning process (Brown & Glasner, 1999, among others). Another factor should be mentioned in relation to the subject "World Economic History". In the final examination, which counts for 60% of the final grade, the specific assessment regulations for this subject offer certain advantages to continuous assessment students: they do not have to complete as many questions, and they have more choice of which questions to answer.

One obvious question arises from the results: why hasn't there been a significant improvement over time in the marks for tests and exercises completed during continuous evaluation? To answer this question, we must look at the teaching method, contents and dynamics of practical classes or group tutorials and, above all, we must examine the type of evaluation used in the continuous assessment process. Table 3 provides information on this last area. The data come from a sample of almost 2,700 observations. Although they should be treated with caution, they illustrate two very important aspects. First, most of the lecturers who provided information about the types of evaluation they used during continuous assessment relied on individual written tests, as can be deduced from the number of available observations. Second, the average mark that students obtained in individual written tests is quite low compared to marks for other types of assessment, such as group written assignments, group projects, or oral presentations. Therefore, the most widely used continuous assessment method does not seem to lead to significant improvements in the marks obtained by students during this process.

3. Conclusions

This study analysed the impact of continuous assessment of learning on the academic achievement of university students over the last decade. We focused on World Economic History: a compulsory subject in the first year of the Economics and Business Administration and Management degrees at the University of Barcelona's Faculty of Economics and Business. Unlike other studies, we adopted a long-term analytical perspective, as data were available from academic year 2003-2004 to 2012-2013. Our conclusions are the following:

1. Continuous assessment can help to improve students' academic achievement, as indicated in other studies (e.g. Claveria, 2009 and 2011, Martínez & Cadenato, 2009, Arribas, 2012, Blázquez et alii, 2013). According to data available for the subject "World Economic History", the difference in the academic achievement and grades of continuous assessment and single assessment students increased over the last decade.

2. The mechanisms for improving the academic achievement of students through continuous assessment appear to be more complex than perhaps could have been expected. According to the available information, continuous assessment students' final grades improved more than their marks for tests and exercises completed during continuous assessment in the practical classes. Between the academic years 2005-2006 and 2012-2013, the final grade improved by between 10 and 15%, whilst the mark for tests and exercises remained practically the same. This could indicate that continuous assessment has a positive effect on academic performance through indirect mechanisms, such as the gradual assimilation of contents, or students' greater awareness during the learning process.

3. We should highlight the lack of significant improvement in the marks for continuous assessment tests and exercises completed in practical classes. There is probably room for improvement in this area. We could formulate the following hypothesis: the negligible improvement in marks for continuous assessment tests and exercises may be at least partly related to the evaluation methods used in the practical classes, the most common of which was the individual written test.

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