LA INFLUENCIA DE LAS ACTIVIDADES DE AUTOEVALUACIÓN EN EL RENDIMIENTO ACADÉMICO DE LOS ESTUDIANTES

THE INFLUENCE OF SELF-ASSESSMENT ACTIVITIES ON STUDENT LEARNING OUTCOMES

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RESUMEN

En el marco del Espacio Europeo de Educación Superior, los estudiantes asumen mayor responsabilidad en su proceso de aprendizaje. A través de las actividades de autoevaluación (realizadas mediante el uso de plataformas virtuales), los estudiantes aumentan su autonomía, responsabilidad, comunicación y flexibilidad en su proceso de aprendizaje. Este estudio utiliza una muestra de 356 estudiantes durante el curso académico 2016/2017. Los resultados muestran un impacto positivo entre la participación de los estudiantes en las actividades de autoevaluación y su rendimiento académico. Los factores individuales y académicos, así como la actitud hacia la asignatura influyen en la participación de los estudiantes en las actividades de autoevaluación.

PALABRAS CLAVE

autoevaluación; plataformas virtuales; rendimiento académico; características individuales; características académicas

ABSTRACT

In the European Higher Education Area, students assume responsibility for their own learning. Using self-assessment activities (carried out on virtual platforms), students increase their autonomy, responsibility, communication and flexibility in their learning process. This study uses a sample of 356 students during the academic year 2016/2017. The results show a positive impact between student participation in self-assessment activities and their learning outcomes. Individual and academic factors as well as attitude towards the subject influence students' participation in self-assessment activities.

KEYWORDS

self-assessment; virtual platforms; learning outcomes; individual characteristics; academic characteristics

INTRODUCTION

The need to adapt university education to the European Higher Education Area implies a deep change to classroom dynamics. In this new training and education culture, students are an active and important part of their learning process, so it is necessary to encourage self-assessment activities to complement continuous assessment (Delgado-García & Oliver-Cuello, 2009).

Self-assessment activities imply a change in the traditional learning methodology: from the lecture, with its one-way focus in which student knowledge is mainly acquired through memory, to a more participatory class –characterized by a multidirectional communication, whose main objective is to evaluate the acquisition of knowledge and skills through continuous assessment (Barca-Enríquez et al, 2014; Delgado-García & Oliver-Cuello, 2009). In this new context, students are more in charge of their learning, they have more responsibility, autonomy and their level of confidence, while being as proactive as possible (Sung et al, 2005). Teachers guide their students during their learning process, but their role becomes more secondary (García-Beltrán et al, 2016).

This new paradigm enables students to adapt to the current challenges related to the increases in economic and business competitiveness, social and labor flexibility and to use new technology. Particularly, technological progress is one of the main factors in the change of teaching methodologies, since new information technologies have become a key instrument for the acquisition of different skills in a responsible and autonomous manner (Delgado-García & Oliver-Cuello, 2009; García-Beltrán et al, 2016).

On the basis of the above, self-assessment can, therefore, be combined with new technologies (e.g., virtual platforms). The use of virtual platforms has been made possible by the development of information technologies and their implementation in the general population. In Spain, 94.6% of the population has

some type of smartphone with Internet access, and the penetration rate of tablets exceeds 75% (Informe Ditrendia, 2017). In this context, self-assessment activities conducted on virtual platforms afford many advantages (García-Beltrán et al, 2016). For example: (1) to increase individualized learning monitoring; (2) to assess student knowledge and skill; (3) to add temporary and geographic flexibility; (4) to provide constant and instant feedback; or (5) to allow an asynchronous interaction with teachers or other students.

Research finds enhanced learning outcomes when students adopt a more active, continuous and participatory role in their training process (Ríos-Muñoz & Troncoso, 2003; Sharma et al, 2016). In particular, the studies cited show that self-assessment activities positively influence student performance and satisfaction (Irimia-Diéguez et al, 2014; López-Pérez, Pérez-López, & Rodríguez-Ariza, 2011; Valentín et al, 2013). However, the literature is not abundant and more studies are needed to find conclusive and stronger relationships and to verify which factors influence student participation in these new methodologies (Chiswick & Miller, 2003; Jones-White et al, 2010; Kherfi, 2008; Martín-García & Rodríguez-Conde, 2003). Therefore, the aim of this paper is to contribute to the existing knowledge on self-assessment activities and learning outcomes, and analyze the main factors of student participation in self-assessment activities.

This paper is structured as follows. Section 2 provides a review of the literature and establishes the hypotheses. Section 3 deals with the methodology and analysis. The results are given in Section 4 and the main conclusions and implications are drawn in Section 5.

THEORETICAL FRAMEWORK AND HYPOTHESES

Self-assessment activities are a key tool in students' learning processes. These activities enable students to think about the quality of their work, and let them judge the degree to which objectives are achieved and guidelines are adhered to in relation to the subject (Andrade & Valtcheva, 2009). Student participation in activities related to their training improves their learning (López-Pastor, Gónzalez-Pascual, & Barba-Martí, 2006; Ríos-Muñoz & Troncoso, 2003; Sharma et al, 2016). Students who frequently use self-assessment tools have a better awareness, assumption and internationalization of learning contents, which improves the teaching-learning process (López-Pastor, Gónzalez-Pascual, & Barba-Martín, 2006).

Many studies claim that self-assessment activities may increase student interest and motivation, which, in turn, improves their learning outcomes and their academic performance (Sharma et al, 2016). Therefore, student self-assessment gives learners an idea of their current level in relation to the final exam, and hence put them in a position to make appropriate decisions to improve their performance. In addition, the literature has shown a clear relationship between the active student participation in self-assessment activities –through virtual platforms– and final exam results, which allows us to conclude that a greater participation has positive consequences on student academic performance (Irimia-Diéguez et al, 2014; López-Pérez, Pérez-López, & Rodríguez-Ariza, 2011) and on student satisfaction (Valentín et al, 2013). Based on these arguments, the first hypothesis is formulated in the following terms:

H1: Learning outcomes are greater when student participation in self-assessment activities –through virtual platforms– is increased.

Furthermore, student participation in self-assessment activities may be modulated by some factors. In particular, this study considers the influence of individual factors, academic factors and student attitude towards the subject. First, in relation to individual factors, student gender, age and nationality are analyzed. Regarding gender, the literature states that student participation may be conditioned by gender (Kherfi, 2008; Martí, 2012). In particular, Aguilar- Rivera (2010) points out that learning styles and strategies that students prefer vary according to student gender, and Marcenaro-Gutiérrez and Navarro-Gómez (2007) claim that the effectiveness of some kind of learning depends on whether the student is male or female. In addition, Aguilar-Rivera (2010) states that women have prefer cognitive learning strategies, study techniques, reviews and self-assessment activities. Therefore, if a woman shows more inclination to self-assessment activities, it is logical to think that her participation in these activities will be greater than that of a man.

Also, student age is also a demographic factor that may influence student participation in self-assessment activities, since students belonging to different age ranges tend to manifest different learning styles, which influences the design of specific methodologies based on their age range (Martín-García & Rodríguez-Conde, 2003). Younger students tend to be characterized by more active learning approaches, whereas approaches tend to become more abstract as student age increases, since their memory capacity is less extensive (Dorsey & Pierson, 1984). Finally, regarding nationality, foreign students tend to perform worse than national students (Chiswick & Miller, 2003), and this may have an impact on their participation in learning activities (like self-assessment activities). Sociocultural differences are often behind this. Calero, Choi, & Waisgrais (2009) also point out that the above disparities are mainly due to personal and family circumstances, and also to some university factors.

Second, it is interesting to analyze the impact of academic factors. The number of times that students have enrolled in a subject, as well as the number of times they have taken the exam, may be factors of special relevance. In this sense, student learning style is affected when a student enrolls in a subject on more than one occasion, as well as when he/she fails its exam and has to repeat it (Glick & Sahn, 2010). These students have a high probability of abandoning their studies (Martí, 2012) and their effort is generally lower, so their participation and their expected results will be worse compared to students who enroll once and pass their exams (Glick & Sahn, 2010).

The classroom groups assigned to students (morning groups vs afternoon groups) may also be an academic factor that influences student participation in self-assessment activities. In any case, this influence depends on the context of study (Barrio & Nicasio-Gutiérrez, 2000), and some students maximize their implications in morning groups, while others do so in afternoon groups. Padilla-Muñoz (2002) finds a greater acceptance of continuous assessment activities in morning groups over afternoon groups, since in afternoon groups the number of students is higher, so they are more reluctant to participate in these activities. Thus, in our case, since the number of students is lower in morning group, student participation in self-assessment activities is expected to be higher when the student belongs to morning groups.

Third, we analyze a factor related to student's attitude: student satisfaction toward the subject. Self-assessment activities are designed as an important tool in which a positive and proactive attitude is important to achieve better student

performance (Ríos-Muñoz & Troncoso, 2003). A favorable attitude is positively related to student participation in self-assessment activities and to the score obtained in these tests, which, in turn, has a favorable effect on their learning process (Sharma et al, 2016).

Considering these arguments, hypothesis 2 is formulated in the following terms:

H2: Student participation in self-assessment activities is greater when: (a) the student is a woman, is younger and its nationality is Spanish; (b) the student passes the exam the first time that he/she is enrolled in the subject and he/she is in morning classroom group; and (c) when student satisfaction toward the subject is higher.

METHODOLOGY

Population and simple

The University of Murcia uses two computer platforms to collect information: Surveys (https://encuestas.um.es/encuestas/) –related to students' satisfaction; and the SAKAI platform (https: // aulavirtual.um.es/) for self-assessment data. Our population is the students on the Degree in Labor Relations and Human Resources, which in the academic year e 2016/17 comprised 1034 students. The final sample is 356 students, who belong to two different subjects (referring to the first year): 284 students from *Management* and 356 students from *Work Organization*.

The following schedule was carried out to collect information and to define the work plan: *Phase 1 (September - October 2016)*, in which the research objectives are set, the methodology to be applied and the specific tasks/activities to be carried out are described, and an initial diagnosis of each subject is carried out; *Phase 2 (October 2016 - May 2017)*, where we explain to students the information on methodology and self-assessment materials that are prepared for each topic and its implementation/application through the SAKAI platform; and *Phase 3 (May - June 2017)*, when the data are collected and the results are analyzed.

Measures

Student participation in self-assessment activities. It is measured through the number of self-evaluation activities carried out on the total number of self-evaluation activities requested.

Learning outcomes. They are measured by the final grade obtained by students in their final exam of the subject. This variable does not include other evaluation activities carried out by the student, since its goal is to collect an impartial activity that may measure student's knowledge level.

Individual characteristics. Gender is a dichotomous variable that takes the value 1 when the student is a woman and 0 otherwise. *Age* is a continuous scale, which measure the age in years of students. And *student nationality* is a dichotomous variable that measures student birthplace, and takes the value 1 when the student is a foreigner and 0 when the student is Spanish.

Academic characteristics. Times enrolled in the subject area continuous variable, which measures the number of times that a student has enrolled on the subject. *Previous attempts to pass the subject* are also a continuous variable, which measures the number of times that a student has taken the exam of the subject. And *classroom group* is a dichotomous variable, which takes the value 1

when a student belongs to morning groups and 0 when a student belongs to afternoon groups.

Attitude towards the subject. Satisfaction is measured through five indicators, which are based on a Likert scale of 5 points collected by the Quality Unit of the University of Murcia. In particular, this scale aims to ascertain if the student is satisfied with the class and the contribution of the subject to his/her educational and professional development.

RESULTS

Student participation in the self-assessment activities

Results show that student participation in self-assessment activities is different for *Work Organization* and *Management*. It is very high (N=356) in *Work Organization*, given the importance of these activities and the weight they have in the student's final grade (40%), so many students (50.8%) have carried out "all" self-assessment activities and another important group (13.2%) have carried out "most" of them. However, 100 students of 356 (28.1%) have not carried out any self-assessment activity, since they preferred to be evaluated through a single final test.

In *Management*, student participation is not as high (N=284), since self-assessment activities represent a lower weight in the final grade (15%). In any case, 19.4% of the students have carried out "all" self-assessment activities and another important group (15.6%) the "majority" of these activities. Moreover, one third of the students (35.6%) have not carried out any self-assessment activity and prefer to be evaluated through a single final test.

Effects of self-assessment evaluation on student learning

Although student participation in self-assessment activities is different for the two subjects examined, its effects on learning outcomes are significant in both.

First, we estimated the bivariate correlation between student participation in self-assessment activities and its learning outcomes. Two test measures were used through t-Student: (a) a first contrast that compared the score between students who participated in self-assessment activities and those who did not; and (b) a second contrast that focused on students who participated in self-evaluation activities, comparing between students who have performed most of the self-evaluation activities and those who performed less.

The results, shown in Table 1, indicate that the participation in self-assessment activities improves student outcomes in *Work Organization*, since the correlation level is 0.451. A positive and significant association between both variables is found. In addition, when we compare between students who performed one or more self-assessments and those who did not perform any, the former obtain a higher learning outcomes than the latter (6.98 vs. 3.55). Moreover, students obtained a higher learning outcomes when the majority of self-assessment activities are performed compared to those who performed a minority number of them (7.28 vs. 3.99).

Table 1. Work Organization Subject: Effects of student participation in self-assessment activities on student learning outcomes

Association between student participation in self-assessment tests and learning outcomes

	N	Pearson's statistic	Significance
Bivariate Correlation	260	**0.451**	0.000
Learning outcomes based on student participation in self-assessment activities			
	N (%)	Final Score (standard deviation)	Student t (significance)
One or more self-assessment tests realized	242 (93.07)	**6.98** (3.11)	5.559 (0.000)
No self-assessment tests realized	18 (6.92)	**3.55** (2.47)	
Learning outcomes based on student participation in self-assessment activities			
	N (%)	Final Score (standard deviation)	Student t (significance)
Majority of self-assessment tests realized (less than 50%)	222 (91.4)	**7.28** (3.02)	4.824 (0.000)
Minority of self-Assessment tests realized (more than 50%)	21 (8.6)	**3.99** (2.45)	

The results in *Management*, shown in Table 2, are similar to *Work Organization*. First, we found a significant association between student participation in self-assessment activities and learning outcomes of students (0.410). Second, it is observed that students obtained higher outcomes when they performed one or more self-assessment activities in relation to when they did none a minority (5.95 vs. 4.87; 6.62 vs. 5.51). Therefore, Hypothesis 1 is supported, so students' learning outcomes, in *Management* and *Work Organization*, increase when student participation in self-assessment activities increases.

Table 2. Management Subject: Effects of student participation in self-assessment activities on student learning outcomes

Association between student participation in self-assessment tests and learning outcomes			
	N	Pearson's statistic	Significance
Bivariate Correlation	284	**0.410**	0.001
Learning outcomes based on the student's participation in the self-assessment activities			
	N (%)	Final Score (standard deviation)	Student t (significance)
One or more self-assessment tests realized	99 (60.36)	**5.95** (2.23)	3.058 (0.003)
No self-assessment tests realized	65 (39.64)	**4.87** (2.20)	
Learning outcomes based on the student's level of participation in the self-assessment activities			
	N (%)	Final Score (standard deviation)	Student t (significance)
Majority of self-assessment tests realized (2 or 3)	39 (39.4)	**6.62** (2.38)	2.500 (0.014)
Minority of self-Assessment tests realized (0 o 1)	60 (60.6)	**5.51** (1.98)	

Determining factors of self-assessment

After verifying the positive effects between self-assessment activities and learning outcomes, a regression analysis was made regarding student participation in self-evaluation activities. Note that variables correlate in the expected sense, and that no problems of multicollinearity in the models were detected[1].

Two models were run (see Table 3), and the dependent variable was student participation in self-assessment activities. Independent variables were student gender, age, birthplace, times enrolled in the subject, previous attempts to pass the subject, classroom group and student satisfaction towards the subject. The definition of these variables is indicated above. Specifically, student gender, age and birthplace reflect students' personal characteristics; times enrolled in the subject, previous attempts to pass it, and classroom group reflects students' academic characteristics; and student satisfaction with the subject reflect students' attitudes towards the subject.

In relation to individual characteristics, we found that females participate significantly more in self-assessment activities (B = 0.11, p <0.000) in *Management* (model 2). However, this relation was not significant in *Work Organization*. Also, no significant results were obtained in relation to student age and birthplace, either in *Management* or *Work Organization*.

Regarding academic factors, we found that student participation in self-assessment activities increases when students have more difficulties to pass their exam (model 1: B = 0.13, p <0.000, model 2: B = 0.08, p <0.1), and when students belong to morning groups (model 1: B = -0.07, p <0.05, model 2: B = -0.06, p <0.1). In addition, in *Management*, students who have enrolled several times in the subject participate significantly less in self-assessment activities (Model 2: B = -0.11, p <0.000), while this factor was not significant in *Work Organization*.

Finally, with regard to student attitude towards the subject, we found that student participation in self-evaluation activities increases when their satisfaction with the subject is greater. However, this result is only significant in *Management* (model 2: B = -0.36, p <0.000). In *Work Organization*, no significant results were found. Based on the above results, Hypothesis 2 is partially supported. In *Management*, student participation in self-assessment activities is significantly affected by gender, by all the academic characteristics, and by students' attitude towards the subject. However, in *Work Organization*, student participation is only significantly affected by some academic characteristics (such as, students with more difficulties in passing their exam and students who belong to morning groups).

Table 3. Characterizing factors of self-assessment and learning outcomes

Independent variables	Model 1[a]	Model 2[b]
Individual characteristic of the student		
Gender	0.04	0.11***
Age	-0.02	0.01
Foreign student	-0.02	0.03
Academic characteristic of the student		
Times enrolled in the subject	0.02	-0.11**
Previous attempts to pass the subject	0.13***	0.08*
Classroom group	-0.07**	-0.06*
Attitude of the student toward the subject		

[1]Descriptive table and correlation matrix are available upon request to the authors.

Student satisfaction with the subject	0.36***	-0.01
F	124.32***	105.16***
R^2	0.74	0.85

Note: [a.] Work Organization Subject; [b.] Management subject; * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

CONCLUSIONS AND IMPLICATIONS

Students improve their results with self-assessment activities, since we found that learning outcomes increase when student participation in self-assessment activities is greater. Student participation in self-assessment activities is scarcely affected by individual factors – only gender is significant in *Management*, with females participating more than males in this subject. We did not find that student age or birthplace influences the level of student participation.

Participation is conditioned by academic factors, like the number of times that students have enrolled in the subject and the number of times that they have previously taken the exam. In this sense, students who fail their exam tend to participate more in self-assessment activities than others. Although this result is not significant when students repeat the subject but do not take the exam. In addition, students in afternoon groups are less likely to participate in self-assessment activities. Finally, the participation is conditioned by student attitude, especially by their satisfaction with the subject.

Based on these results, we state some practical recommendations. A plan needs to be designed to ensure that the repeating students can do the self-assessment activities and they can engage in the continuous assessment of the subject. Also, this plan has to be designed for students who belong to afternoon groups who cannot go to class, with the aim of encouraging their participation in the continuous assessment of the subject. In addition, self-assessment activities should be designed to offer students additional information about their continuous performance. This feedback is important to stimulate them and increase their participation. Lastly, the action plan has to be designed to improve the learning outcomes of repeating students or students with greater difficulties in taking the exam.

DECLARACIÓN DE CONFLICTO DE INTERESES

Los autores declararon que no existen conflictos de intereses potenciales con respecto a la investigación, autoría y / o publicación de este artículo.

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Cita recomendada