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Moderating role of gender in the performance of Moodle questionnaires in an introductory Accounting course

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Abstract

The purpose of this paper is to present the results of Moodle questionnaires in an introductory Accounting Course taught in the University of Valencia. This learning platform is new for our University so there is a need to create new resources and plan how to use them in the continuous assessment system. The teacher developed eight questionnaires and assigned 10% of the final mark to the performance of students in these questionnaires. This pioneer experience was carried out in a group of 53 students, 46 of which followed this methodology. Our results show that gender is significantly associated to this fact, i.e. women tend to participate more in this activity and the final exam mark they obtain improves with this participation.

1. Introduction

Following the Bologna Declaration (European Ministers of Education, 1999), important changes were undertaken in order to introduce a more comparable, compatible and coherent system for European higher education. In the European Higher Education Area (EHEA) launched in 2010, Information and Communication Technologies (ICTs) can help the teacher create new resources for the student to acquire knowledge through a more active learning

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process based in competences (Ciudad, 2010, Escobar-Rodriguez & Monge-Lozano, 2012; Garcia-Benau & Zorio-Grima, 2012).

According to the "constructionism theory" (Papert & Harel, 1991), students build their own mental constructs to understand the complex contents they are faced with, mostly through experimentation and discovery. Self-correction questionnaires in the Moodle platform are a well-fitted teaching technique to meet this objective (Martí Ballester & Orgaz Guerrero, 2014). However, there is always certain degree of reluctance to change and not all the individuals are always eager to use ICTs. According to the Technology Acceptance Model (TAM) theoretical framework, Escobar-Rodriguez & Monge-Lozano (2012) analyse why students use Moodle and find causal relationships between how they perceive its usefulness and user-friendliness as well as how they actually use Moodle, plus the perceived usefulness for professors and training.

The objective of this paper is to share this new experience in the Moodle platform as look into the gender side of its effects in the final exam mark of the student.

After this introduction, which briefly presents the research objective, the rest of the paper is organized as follows. The second section describes the teaching experience. The third section looks into the results of the use of questionnaires, i.e. the impact on performance paying special attention to gender differences. Finally, we present the main conclusions that can be drawn from this experience and put forward suggestions for improvement in the next editions of the course.

2. The teaching experience

This experience has been undertaken in a group with 53 students, 46 of which followed this methodology, which amounted up to 10% of the final mark of the course. More precisely, eight online questionnaires were created equally weighted for the continuous assessment methodology. The subject is an introductory Financial Accounting course in the course 2015/16. Table 1 shows some descriptive statistics of the sample. This is a compulsory course for all first-year students in this Degree, which explains that more than 25 % of students have been enrolled in this course in the past. However, these students have never taken these tests in the past, as Moodle is newly implemented in the University and the teacher has just developed the tests for this specific course.

Introductory accounting courses are addressed mostly to freshman with no interest to have a major in accounting, so they might be not as much motivated as upper-level accounting students. As a consequence, teachers of introductory accounting courses find a challenge trying to motivate them. The experience with short quizzes at the beginning of the class as a motivational strategy for students to prepare for the class in advance, encourage punctuality, and help active participation in class discussions has been used for decades with good results (Baldwin, 1980, Liebler, 2003, Brawn & Sellers, 2012). However, with the advent of ICTs feedback with self-correction online administered assessments is timely and is becoming rather popular as a resource-efficient tool. Therefore, questionnaires use has been recently analysed in introductory accounting courses showing good impact on performance (Einig, 2013, Martí Ballester & Orgaz Guerrero, 2014). Formative assessment is highly valuable in the learning-teaching process. As opposed to summative assessment, it is not aimed at grading the students' performance but to improve students' learning by giving feedback on performance and complete answers and connections between concepts (Black & Wiliam, 1998; William &Thompson, 2007).

Table 1. Descriptive statistics of the group

Gender				
women	17	32,08%		
men	36	67,92%		
Age				
18-24	43	81,13%		
25-29	5	9,43%		
30-35	1	1,89%		
35-45	1	1,89%		
>45	3	5,66%		
Number of times enrolled				
1	39	73,6%		
2	8	15,1%		
3	3	5,7%		
4	2	3,8%		
5	1	1,9%		
Working status				
No paid work	35	66,04%		
Works more than 15h per week	10	18,87%		
Works less than 15h per week	8	15,09%		
Final mark in the course				
No shows	14	26,42%		
Failed (5<x)	18	33,96%		
Passed (7>x>5)	14	26,42%		
Good (9>x>7)	7	13,21%		
Parents' education level	father		mother	
No education	8	15,09%	9	16,98%
Primary education	9	16,98%	7	13,21%
Lower Secondary education	12	22,64%	12	22,64%
Higher Secondary education	6	11,32%	11	20,75%
University degree	18	33,96%	14	26,42%

3. Analysis of results

3.1 Gender differences: analysis of descriptive statistics

A sample of 46 students who undergo continuous assessment in Moodle is used, 16 are women (34.78%) and 30 are men (65.22%). This means that from the total of 53 students of the subject, the 94.12% of women have chosen to follow the system of continuous assessment against the 83.33% of men.

The following analyses focus only on those students who follow continuous assessment at Moodle.
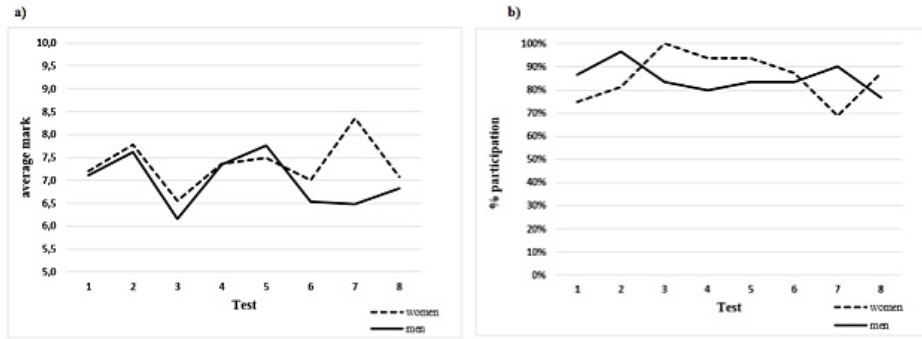
Fig.1. a) Average mark obtained. b) Percentage of participation.

Figure 1.a suggests that there is no clear trend of improvement in the tests' marks along the course (no differences shown per gender). The percentage of participation of men and women (Figure 1.b) seems to present an opposite behavior, although both remain approximately constant over the course.

Note that the relationship between the percentage of participation and the average mark with the variable "Test" does not necessarily represent the evolution of students in the system of continuous assessment, since the theoretical difficulty of each unit is different and known a priori by the student, discouraging his/her participation in specific tests. The contents of each test are not cumulative, so there is no overlapping.

3.2 Analysing the relation between the continuous assessment system and the final exam mark: multiple linear regression analysis

A sample of 39 students, including those students who follow continuous assessment in Moodle and also show at the final exam, is used.

A multiple linear regression has been conducted by the Stepwise method, considering as dependent variable the mark obtained in the final exam ($EXAM$) and as independent variables the average mark of the tests ($Test$), the gender ($gender$, dummy variable which takes value "1" for female students) and their interaction.

The proposed initial model would be:

$$E(EXAM) = \beta_0 + \beta_1 Test + \beta_2 gender + \beta_3 Test \times gender.$$

The interpretation of the parameters is as follows.

β_0: expected mark in the final exam for a male student who has obtained an average mark in continuous assessment tests equal to 0.

β_1: increase in the expected mark in the final exam for a male student when the average mark of the continuous assessment tests increases by one point.

β_2: difference in the expected mark in the final exam when she has obtained an average mark in continuous assessment tests equal to 0, for a woman compared to a man.

β_3: difference in the expected mark in the final exam when the average mark of the continuous assessment tests increases by one point, for a woman compared to a man.

Table 2. ANOVA results of the linear regression model.

Model	Sum of squares	Freedom degrees	Mean	F	Sig.
Regression	24.359	1	24.359	6.794	0.013
Residual	132.666	37	3.586		
Total	257.025	38			

The model is significant (p-value = 0.013, Table 2), with a R^2=0.155 (Table 3). The final model is as follows,

$$(EXAM)=4.377+0.241\ Test \times gender.$$

Notice that there is no difference to the expected mark in the final exam between men and women when the student's average mark in the continuous assessment tests is equal to cero. Furthermore, no significant difference between men were found, but in the case of women for every increment by one point of her average mark in the continuous assessment an increase of 0.241 points occurs in the expected mark of the final exam (Table 3).

Table 3. Coefficients of the linear regression model.

Model	Non-standarized coefficients		Standarized coefficients	t	Sig.
	B	Standard error	Beta		
Constant	4.377	0.362		12.101	0.000
$Test \times gender$	0.241	0.092	0.394	2.606	0.013

The model for female students would be:

$$(EXAM)=4.377+0.241\ Test.$$

The model meets the hypotheses of normality of the residuals, no residual autocorrelation and homoscedasticity. Concerning multicollinearity, variables $gender$ and $Test$ are uncorrelated but, logically, they are correlated with their interaction. The solution was to test a simpler model considering only the variables $gender$ and $Test$. The result is that the variable $gender$ is significant but the model has an adjusted R^2 smaller than the proposed in this paper. Thus, including $Test \times gender$ a Stepwise multiple linear regression model is proposed, with higher R^2, without the presence of multicollinearity and, therefore, no bias in the parameters estimation.

4. Conclusions

We present our first-time experience in an introductory accounting course with online questionnaires in the new platform Moodle used as formative assessment. Our results show that women are more interested in participating responding the online questionnaires and that this has a positive impact in their performance at the final exam. This formative experience is therefore an adequate signaling mechanism for men as regards their prospective exam results, whereas for women, in addition, participation is also valuable at improving their exam results. Educational implications of the results are relevant in the sense that teachers can change their communication strategy with students in view of this moderating role of gender on performance and try to avoid its negative effects.

Our research has some limitations, such as not being able to control for prior knowledge, motivation, use of ICTs, personal effort or ambition. Some data could be obtained to describe the whole sample (e.g. working status, parents education degree), yet not in disaggregated terms to allow for controlling variables. In future studies, *these* types of variables will be collected from participants in order to enrich future analysis.

Acknowledgements

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