



Key variables for academic performance in university accounting studies. A mediation model

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This paper highlights the importance of conducting studies to ascertain students’ perceptions of the teaching-learning process, as this information can provide a valuable guide to course planning and enhance teaching. This study analyses, based on structural equation modelling, the relationship between students’ academic performance in an accounting course offered at the University of Granada and these students’ perceptions of aspects of the teaching-learning process. Results show that academic achievement is directly related, positively and significantly, to students’ *prior interest* in the course, their perceptions of *the usefulness of the course*, their level of *class participation*, their *prior academic achievement* and their *age*. Furthermore, we found that the *prior interest* of the students in the course is indirectly related to the *final grade* obtained, through the variables *usefulness of the course* and *class participation*. The implications of the results are discussed.

Introduction

Nowadays, universities have to play a new role, focusing on knowledge acquisition and also on students’ intellectual development, enabling them to learn concepts and theories as well as skills, abilities and values (Lemos, Queirós, Teixeira, & Menezes, 2011). This perspective is consistent with the constructivist assumption which states that the way a person engages in educational processes impacts on their learning (Coates, 2005). From this point of view, the students play a key role in their learning.

According to the above considerations, students’ prior interest in their degree subject is expected to play a major role in determining the extent and effectiveness of their learning. However, in the specific case of the students enrolled in business-related studies at the University of Granada, 75% of them selected this study area on the basis of the job prospects expected, independently of their own vocational orientation (Luque, Barrio, Sánchez, Ibañez, & Doña, 2016).

Previous research in the [areas of finance and accounting](#) has analysed some factors believed to be associated with student performance (Uyar & Güngörmüş, 2011), but further empirical evidence is needed about the relationship between key learning variables and students' outcomes, and about how students' learning and academic performance may be improved.

For all these reasons, the present study focuses on the Degree in Finance and Accounting offered at [the](#) University of Granada, with particular attention to students' *prior interest in the course* and some other student-related variables, such as *study time*, *class attendance* and *class participation*. In previous studies, these variables have been incorporated into the construct *student engagement* (Kahu, 2013; Zepke, 2015). According to Russell, Ainley and Frydenberg (2005, p.1), engagement represents 'the energy in action, the connection between the person and the activity', that is, the commitment to learning. Furthermore, we focus on the students' perceptions about the *usefulness of their learning of the course*. To the extent that student interest is a relevant factor in the design of the environment (e.g., activities, programming, pedagogies, etc.), which should seek to promote engagement (Renninger & Bachrach, 2015), we analyse through other study variables the possible indirect effect of this prior interest on the grades obtained.

Thus, the results of the present study are expected to fill a perceived research gap in studies of key learning variables for undergraduate accounting students, providing a better understanding of how prior student interest in a course, together with other important variables in the teaching-learning process, are related to academic achievement. One way in which interest and engagement can be developed is through the actions performed by educators acting as potential supporters of learning. Our study contributes to the literature by identifying potential areas for change and innovation by

educators, enhancing the learning process in accounting courses and, especially, by introducing certain variables that have received little previous research attention in this context, namely prior interest and perceptions of the usefulness of the course. In these analyses, a mediation model is applied.

In the next section, the research literature in the field is reviewed and the initial hypotheses formulated. The third section presents the methodology used. The findings obtained are shown and then discussed.

Review of the literature and formulation of hypotheses

The prior interest shown by students in a course is a relevant factor to consider in their evaluations of the teaching received (Morley, 2014). Students who value and are interested in a course are more likely to report a more profound information processing approach, which usually leads to higher academic achievement. Previous research has shown a relationship between intrinsic interest and students' performance in different academic contexts (Lee, McInerney, Liem, & Ortega, 2010). In this sense, prior interest is a variable that can have an impact on the students' academic achievement (Blankenburg, Höffler, & Parchmann, 2016).

The study of the relationship between prior interest and subsequent academic achievement is particularly relevant in Finance and Accounting studies, because business and management students present different types of motivation for these studies, often more closely related to job prospects and career considerations than to the intrinsic attraction of the degree courses (Ottewill, 2003). In this paper we analyse the direct relationship between the variables mentioned above, through the following hypothesis:

H1: There is a positive relationship between students' prior interest in the

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3 *course and their final grade.*

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5 From the constructivist perspective, students are required to be actively involved
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7 in the learning process (Baeten, Dochy & Struyven, 2013; Lemos et al., 2011). This
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9 means there needs to be a student commitment to acquiring knowledge and to using the
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11 tools made available by their teachers. Thus, studying aspects of students' learning
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13 strategy is an area of major importance (Lemos et al., 2011), in that students' level of
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15 commitment, or engagement, has been identified as an important element for improving
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17 their learning experience (Holmes, 2014).
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21 Student commitment includes the time spent and the actions carried out by
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23 students in the educational sphere (Kuh, 2003). Thus, variables such as class attendance,
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25 class participation and study time in each course form part of students' commitment to
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27 their own learning.
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31 The time devoted by students to studying the course is commonly considered a
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33 good predictor of academic success (Tlhoale, Hofman, Winnips, & Beetsma, 2014),
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35 although research findings are contradictory (Masui, Broeckmans, Doumen, Groenen, &
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37 Molenberghs, 2014). Thus, further research is needed into the relationship between
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39 study time and students' academic achievement in different areas of knowledge.
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41 Therefore, we formulate the following hypothesis:
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45 *H2: The amount of time students spend studying the course has a positive impact*
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47 *on their final grade.*
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51 Students' actions in the classroom, namely attendance and participation, can also
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53 influence their academic performance. In this respect, some authors claim that poor
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55 class attendance has a negative impact on achievement (Al-Twajjry, 2010). Regarding
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57 participation, some studies have revealed a certain degree of passivity in university
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59 students (Cutler, 2007), with a negative impact on their learning. Students' participation
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is important for them to become committed to their educational work (Holmes, 2014), as well as to improve their academic performance (Sanchez-Elez et al., 2014). In the present study, we examine whether students' actions in the classroom can improve their academic achievement. For this purpose, we formulate two hypotheses:

H3: *Students' class attendance is positively associated with their final grade.*

H4: *Students' class participation rate is positively associated with their final grade.*

Another aspect that can affect academic achievement is the student experience of the learning context (e.g. good teaching, clear goals) (Prosser & Trigwell, 2014). Student perception of the usefulness of the learning experience has been linked to success in learning the course (Lemos et al., 2011). However, little has been reported of the benefits of the learning environment on students' achievement (Baeten et al., 2013). Accordingly, this paper studies the relationship between students' perceptions of the usefulness of the course and their academic achievements, which is expressed in the following hypothesis:

H5: *There is a positive relationship between the perceived usefulness of the course and students' final grade.*

Finally, as stated by Denson, Loveday and Dalton (2010), students' prior interest in a course motivates them to study the material in that course, which will have a positive effect on student-related variables such as study time, class attendance and class participation. Furthermore, Kyndt, Berghmans, Dochy and Bulckens (2014) have found that students who are interested in a particular course spend much more time on it and perceive a lower workload. Therefore, it seems reasonable to assume that the greater the interest, the greater the engagement, with consequent benefits regarding

study time, class attendance and class participation. Furthermore, given that greater interest in the study course contributes to students' commitment to its content (Hagay & Baram-Tsabari, 2015), when students are interested in a given field of study, they will probably consider it to be useful.

Thus, study time, class attendance, class participation and perceived course usefulness could mediate the relationship between prior interest and students' academic achievement. This aspect has not been previously studied, and we believe it should be examined, in order to better understand these relationships and possibly improve learning outcomes. For this purpose, we formulate the following hypotheses:

H6: The relationship between students' prior interest and their final grade is mediated by study time ($H6_a$), class attendance ($H6_b$), class participation ($H6_c$) and perceived course usefulness ($H6_d$).

Moreover, according to previous studies, students' performance is related to their gender and their performance prior to university entrance (Cassidy, 2012; Smith & White, 2015). Thus, these variables are included as control variables in this study.

To conclude this section, Figure 1 presents the conceptual model containing the hypotheses proposed in this study.

INSERT FIGURE 1

Methodology

This study focuses on an accounting course of the Finance and Accounting Degree at the University of Granada in the academic year 2015/2016.

The study was carried out using a questionnaire-survey. The students were informed of the purpose of the study and of the anonymous nature of their participation.

The questionnaire was completed at the end of the academic year, and 152 students responded, the response rate being 55.68%.

The variables used in this research are:

(1) Final grade

The final marks obtained by the student in the course exam. This is an open question, scored from 1 to 10 points.

(2) Prior interest

Following Morley (2014), our study questionnaire includes an item about students' prior interest in the course being studied. This variable is measured using a five-point Likert scale, from 1 *No interest* to 5 *Great interest*.

(3) Study time

As in previous research (Choi & Rhee, 2014), this variable is analysed using an open question, where the students state the average number of hours per week dedicated to studying the course.

(4) Class attendance

This is measured using a five-interval scale, where 1 = attendance at *less than 20% of classes*; 2 = *21-40%*; 3 = *41-60%*; 4 = *61-80%*; and 5 = *more than 80%*.

(5) Class participation

The evaluation of student participation in class is based on the level at which the student has asked and answered questions in class, shared ideas and experiences and discussed issues with other classmates (Mariskind, 2013). Students rated their own

participation in these areas on a five-point Likert scale, from 1 = no participation in the above areas to 5 = active participation in all of them (Nikolaidis & Dimitriadis, 2014).

(6) Usefulness of the course

In line with Lemos et al. (2011), we focus on contextual aspects relating to the usefulness of the methodology used, usefulness of the materials used and usefulness of the class content. These three items were measure on five-point Likert scales, from 1 = Not at all useful to 5 = Very useful.

An exploratory factor analysis was applied to these three variables to determine whether they could be grouped into a single dimension called usefulness of the course for students' learning. To this end, principal components analysis was used as a statistical tool. Bartlett's test of sphericity presents a degree of significance of 0.000 and the Kaiser-Meyer-Olkin index is higher than 0.5 (0.728), which confirms the existence of a correlation among the three variables and suggests the existence of an underlying structure and, therefore, the applicability of this multivariate analysis technique. The application of this technique led us to obtain a single factor, with an accumulated 77.56% of the variance, called Usefulness of the course. The Cronbach alpha is 0.900 and the composite reliability is 0.900; these values are higher than the minimum recommended 0.7 (Chin, 2010). The factor loadings of the indicators are between 0.825 and 0.927; these are significant and higher than the minimum values of 0.7 (Chin, 2010). In addition, the average variance extracted is 0.75 which demonstrates the convergent validity of this construct (Chin, 2010; Hair, Hult, Ringle, & Sarstedt, 2017).

(7) Gender

This variable is scored as 0 for male students, and 1 for females.

(8) Prior academic achievement

Following Mansfield (2011), this variable was measured in terms of the exam results obtained prior to university entrance. It is a quantitative open question.

The possibility of non-response method bias was tested considering early and late responses to the questionnaire (Chen & Paulraj, 2004). The t-tests applied show that there were no statistically significant differences (at 95% confidence intervals) and that non-response was not a significant problem. We also considered the possibility of common method bias, using two tests. Harman’s one-factor test, applying an exploratory factor analysis, was applied and a structural equation model (SEM) was created, to search for a common latent factor that would determine shared common variance (Podsakoff, MacKenzie, & Podsakoff, 2012). The results of the two tests showed that common method bias did not appear to be of major concern for our statistical analyses.

The study hypotheses were tested by a variance-based SEM, specifically, Partial Least Squares (PLS), by means of SmartPLS 3.2.0 statistical software (Ringle, Wende, & Becker, 2015).

Results

Table 1 shows the descriptive data for the variables and their correlations. On average, the students recorded a prior academic achievement of 6.38 points (the maximum being 10 points), an average age of 21 years and 58% of the students were men. To determine whether the data were affected by multicollinearity, we analysed the correlations of the main variables and examined the variance inflation factor (VIF) of each independent variable. According to the correlation matrix presented in Table 1, the variables are not strongly correlated. VIF values should not exceed 5 (Hair, Anderson, Tatham, & Black,

2006). In our sample, all VIF values were between 1.00 and 1.40, and so we conclude there were no problems of multicollinearity in the data used.

INSERT TABLE 1

The results of the research model are presented in Figure 2. The model explains 22% of the variance of students' final grade. To evaluate the relevance of the change in R^2 , i.e., whether the impact of a specific variable is substantive, we analysed the f^2 effect in the model. Values close to 0.15 indicate a moderate effect (Hair et al., 2017). In this model, the highest f^2 values were obtained for the relation between prior interest and class attendance (0.171) and usefulness of the course (0.167). The predictive capacity of the model, and hence the Q^2 index, was calculated by the Stone-Geisser test. All of the dependent variables presented values above 0, which confirms the predictive power of the model (Hair et al., 2017). The standardised root mean square residual (SRMR) index, defined as the standardised difference between the observed and the predicted correlations, was less than 0.08, and so the model has a sufficient degree of fit (Henseler, Hubona, & Ray, 2016) and presents good structural properties.

INSERT FIGURE 2

The results obtained show that prior interest is positively and significantly associated with the students' final grade, and therefore hypothesis H1 is accepted. Similarly, class participation and the perceived usefulness of the course are positively and significantly associated with the final grade, and so hypotheses H4 and H5, respectively, are accepted. Nevertheless, there was no significant effect of study time or of class attendance on the final grade, and so hypotheses H2 and H3, respectively, were not corroborated.

In relation to the multiple mediation analysis, the students' prior interest in the course is related, positively and significantly, to class attendance, the perceived usefulness of the

course, class participation and study time. There is an indirect effect of prior interest on the final grade through class participation (value: 0.061) and course usefulness (value: 0.068), which act as mediators, and therefore hypotheses H6c and H6d are supported, while hypotheses H6a and H6b are not corroborated. The total effect (direct plus indirect effects) of prior interest on final grade is 0.301.

In relation to the control variables, while prior academic achievement had a positive and significant effect on the final grade, no such relationship was observed for gender.

Discussion

Summary of findings

This study contributes to the previous literature in accounting and incorporates new variables such as students’ prior interest and their perception of the usefulness of the course. Furthermore, a multiple mediation analysis is applied to the study variables.

According to the analyses conducted, prior interest in the accounting course, together with class participation and the perceived usefulness of the course, all have a positive impact on students’ final grades. The variables class participation and the perceived usefulness of the course mediate the relationship between prior interest and the final grade. Through these variables, prior interest has an indirect influence on students’ academic achievement.

Therefore, it is important to foster prior interest among accounting students, especially in the early years of the course, as this will have a positive influence on their academic performance and help counteract the high rates of dropout and repetition observed. Moreover, considering that students in these degree programmes usually express greater interest in career opportunities than in the course itself, the findings of

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2
3 this study confirm the need to design learning activities and strategies that will promote
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5 students' learning.
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8 This research also highlights important practical implications in the area of
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10 accounting, showing that teachers should develop appropriate contents, materials and
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12 methodology, seeking to raise students' perceptions of the value of the course and thus
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14 promote interest, raise class participation and heighten perceptions of its usefulness.
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16 Furthermore, it is necessary to implement activities that underscore the importance of
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18 accounting in the business world, in order to strengthen students' perceptions of the
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20 value of these academic areas.
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24 Accordingly, in the next section, the implications of this research are shown,
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26 namely, that the teaching-learning process in accounting courses can be improved in
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28 two ways: linking with career opportunities and improving methodologies. Also, some
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30 actions developed by other researchers are provided as examples of possible stimulants
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32 of interest, participation and perception of usefulness.
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35 36 37 ***Implications***

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39 The findings obtained suggest that to enhance learning achievements in accounting
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41 studies, teachers could apply activities of the following two types:
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45 (1) Linking accounting courses with career opportunities
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48 As observed by Lee et al. (2010, p. 277), in the design of study activities,
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50 'teachers should be mindful not only of the achievement goal orientations they
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52 encourage but also of the related future goals that may come along with these'. In this
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54 respect, Lawanto and Stewardson (2013) found that task value and intrinsic goal
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56 orientation could be good predictors of students' expectancy of success.
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Taking into account that many students present little previous interest in the courses of finance and accounting, it could be useful to link short-term goals to future goals, which for these students mean job prospects and their future career. Therefore, activities that relate theoretical studies to the business world, such as interviews with professionals, company visits, gamification, or tasks involving companies' real economic and financial information would increase the perceived value of the task and, therefore, students' interest in the course. Chmielewski-Raimondo, McKeown & Brooks (2016) and Zahller (2017) have reported examples of such activities.

(2) Improving teaching-learning methodologies

The analyses carried out reveal that although most students stated that they attended class regularly, this factor is not related to their academic performance. Insofar as class participation affects students' grades, it is necessary to reduce their passivity (Cutler, 2007) by designing teaching activities and strategies that promote students' involvement in their learning. Thus, different forms of student involvement could be used, such as lecture-based active learning or clickers, as tools to improve students' motivation and participation (McCullough & Munro, 2018; Tlhoale, Hofman, Naidoo & Winnips, 2014); mobile phones, with an electronic voting system to increase student engagement (Voelkel & Bennett, 2014); or online collaborative learning or business simulation games, that have been shown to improve students' achievement (Sanchez-Elez et al., 2014).

The teaching methodology used affects the results obtained by the students. For example, adopting a concept mapping strategy could improve students' learning achievement and their interests in learning accounting (Chiou, 2008). On the other hand, team-based learning and debates could lead to interesting discussions with higher levels of students' engagement and motivation to learn and enhance teaching (Cohen &

Robinson, 2018; Jagger, 2013). Furthermore, formative assessment helps students to remain motivated (Jacoby, Heugh, Bax & Branford-White, 2014).

Limitations and future developments

This study has certain limitations. Surveys of students are commonly used in the assessment of teaching practices, and the results obtained help both teachers and institutions (Spooren, Mortelmans & Christiaens, 2014). However, surveys necessarily contain an element of subjectivity, and so it is important to assess their reliability. This fact, coupled with the possibility that our study may reflect differences in the variables examined according to the particular class responding to the survey, has been addressed as far as possible through the use of generally accepted statistical tests, to maximise reliability. Another limitation is the fact that our analysis is limited to a specific context, and in future research, it would be of interest to test these findings, obtained for finance and accounting students, against those for students in other areas, and also to use other performance indicators in order to identify and analyse possible differences.

References

- Al-Twajry, A.A. (2010). Student academic performance in undergraduate managerial-accounting courses. *Journal of Education for Business*, 85, 3311-3322.
- Baeten, M., Dochy, F. & Struyven, K. (2013). The effects of different learning environments on students' motivation for learning and their achievement. *British Journal of Educational Psychology*, 83, 484-501.
- Blankenburg, J.S., Höffler, T.N. & Parchmann, I. (2016). Fostering today what is needed tomorrow: investigating students' interest in science. *Science Education*, 100, 364-391.
- Cassidy, S. (2012). Exploring individual differences as determining factors in student academic achievement in higher education. *Studies in Higher Education*, 37, 793-810.

- Chen, J., & Paulraj, A. (2004). Towards a theory of supply chain management: the constructs and measurements. *Journal of Operations Management*, 22, 119–150.
- Chin, W. W. (2010). How to write up and report PLS analyses. In V. V. Vinzi, W. W. Chin, J. Henseler and H. Wang (Eds.) *Handbook of partial least squares. Concepts, methods and application*: 655-690. Berlin: Springer.
- Chiou, C.C. (2008). The effect of concept mapping on students' learning achievements and interests, *Innovations in Education and Teaching International*, 45(4), 375-387.
- Chmielewski-Raimondo, D. A., McKeown, W. & Brooks, A. (2016). The field as our classroom: Applications in a business-related setting. *Journal of Accounting Education*, 34, 41-48.
- Choi, B.K. & Rhee, B.S. (2014). The influences of student engagement, institutional mission, and cooperative learning climate on the generic competency development of Korean undergraduate students. *Higher Education*, 67, 1–18.
- Coates, H. (2005). The value of student engagement for higher education quality assurance. *Quality in Higher Education* 11, 25–36.
- Cohen, J. & Robinson, C. (2018). Enhancing teaching excellence through team-based learning. *Innovations in Education and Teaching International*, 55(2), 133-142.
- Cutler, A. (2007). Creeping passivity. *Journal of College Science Teaching*, 36, 6–7.
- Denson, N., Loveday, T. & Dalton, H. (2010). Student evaluation of courses: what predicts satisfaction? *Higher Education Research & Development*, 29, 339-356.
- Hagay, G. & Baram-Tsabari, A. (2015). A strategy for incorporating students' interests into the high-school science classroom. *Journal of Research in Science Teaching*, 52, 949–978.
- Hair, J.F., Anderson, R.E., Tatham, R.L., & Black, W.C. (2006). *Multivariate data analysis*, (6th ed.). Upper Saddle River, NJ: Prentice-Hall International, Inc.
- Hair, J. F., Hult, G. T. M., Ringle, C. M., Sarstedt, M. (2017). *A primer on partial least squares structural equation modeling (PLS-SEM)* (2 nd Ed). Sage: Thousand Oaks.
- Henseler, J., Hubona, G., & Ray, P. A. (2016). Using PLS path modeling in new technology research: updated guidelines. *Forthcoming Industrial Management & Data Systems*, 16(1), 2-20.

- Holmes, N. (2014). Student perceptions of their learning and engagement in response to the use of a continuous e-assessment in an undergraduate module. *Assessment & Evaluation in Higher Education*, 40, 1-14.
- Jacoby, J.C., Heugh, S., Bax, C. & Branford-White, C. (2014) Enhancing learning through formative assessment. *Innovations in Education and Teaching International*, 51(1), 72-83.
- Jagger, S. (2013) Affective learning and the classroom debate. *Innovations in Education and Teaching International*, 50(1), 38-50.
- Kahu, E.R. (2013). Framing student engagement in higher education. *Studies in Higher Education*, 38, 758-773.
- Kuh, G.D. (2003). What we're learning about student engagement from NSSE. *Change*, 35, 24-32.
- Kyndt, E., Berghmans, I., Dochy, F. & Bulckens, L. (2014). "Time is not enough". *Workload in higher education: a student perspective. Higher Education Research & Development*, 33, 4, 648-698.
- Lawanto, O. & Stewardson, G. (2013). Students' interest and expectancy for success while engaged in analysis and creative design activities. *International Journal of Technology and Design Education* 23, 213-227.
- Lee, J.Q., McInerney, D.M., Liem, G.A.D. & Ortega, Y.P. (2010). The relationship between future goals and achievement goal orientations: An intrinsic-extrinsic motivation perspective. *Contemporary Educational Psychology*, 35, 264-279.
- Lemos, M.S., Queirós, C., Teixeira, P.M. & Menezes, I. (2011). Development and validation of a theoretically based, multidimensional questionnaire of students' evaluation of university teaching. *Assessment & Evaluation in Higher Education*, 36, 843-864.
- Luque, T, Barrio, S., Sánchez, J., Ibañez, J.A. & Doña, L. (2016). *Estudio de opinión de los titulados de la Universidad de Granada*. [Study of graduates of the University of Granada] Granada: Universidad de Granada.
- Mansfield, R. (2011). The effect of placement experience upon final-year results for surveying degree programmes. *Studies in Higher Education*, 36, 939-952.
- Mariskind, C. (2013) 'Always allowing the voice': expectations of student participation and the disciplining of teachers' practice. *Teaching in Higher Education*, 18, 596-605.

- Masui, C., Broeckmans, J., Doumen, S., Groenen, A. & Molenberghs, G. (2014). Do diligent students perform better? Complex relations between student and course characteristics, study time, and academic performance in higher education. *Studies in Higher Education*, 39, 621-643.
- McCullough, K. & Munro, N. (2018). Finance students' experiences of lecture-based active learning tasks. *Innovations in Education and Teaching International*, 55(1), 65-73.
- Morley, D. (2014). Assessing the reliability of student evaluations of teaching: choosing the right coefficient, *Assessment & Evaluation in Higher Education*, 39, 127-139.
- Nikolaidis, Y. & Dimitriadis, S.G. (2014). On the student evaluation of university courses and faculty members' teaching performance. *European Journal of Operational Research*, 238, 199-207.
- Ottewill, R. (2003). Pedagogic challenges facing business and management educators: Assessing the evidence. *The International Journal of Management Education*, 3, 33-41.
- Podsakoff, P.M., MacKenzie, S.B., & Podsakoff, N.P. (2012). Sources of method bias in social science research and recommendations on how to control it. *Annual Review of Psychology*, 63, 539-569.
- Prosser, M. & Trigwell, K. (2014). Qualitative variation in approaches to university teaching and learning in large first-year classes. *Higher Education*, 67, 783-795.
- Renninger, K.A. & Bachrach, J.E. (2015). Studying triggers for interest and engagement using observational methods. *Educational Psychologist*, 50, 58-69.
- Ringle, C.M., Wende, S., & Becker, J.M. (2015) *SmartPLS 3. Boenningstedt, SmartPLS GmbH*. Retrieved from <http://www.smartpls.com>.
- Russell, V.J., Ainley, M., & Frydenberg, E. (2005). Student motivation and engagement. *Schooling Issues Digest*. Australian Government, Department of Education, Science and Training.
- Sanchez-Elez, M., Pardines, I., Garcia, P., Miñana, G., Roman, S., Sanchez, M. & Risco, J.L. (2014). Enhancing students' learning process through self-generated tests. *Journal of Science Education and Technology* 23, 15-25.
- Smith, E. & White, P. (2015). What makes a successful undergraduate? The relationship between student characteristics, degree subject and academic success at university. *British Educational Research Journal*, 41, 686-708.

- 1
2
3 Spooren, P., Mortelmans, D. & Christiaens, W. (2014). Assessing the validity and
4 reliability of a quick scan for student's evaluation of teaching. Results from
5 confirmatory factor analysis and G Theory. *Studies in Educational Evaluation*,
6 43, 88–94.
7
8
9
10 Tlhoale, M., Hofman, A., Naidoo, A. & Winnips, K. (2014). Using clickers to facilitate
11 interactive engagement activities in a lecture room for improved performance by
12 students. *Innovations in Education and Teaching International*, 51(5), 497-509.
13
14 Tlhoale, M., Hofman, A., Winnips, K. & Beetsma, Y. (2014). The impact of
15 interactive engagement methods on students' academic achievement. *Higher*
16 *Education Research & Development*, 33, 1020-1034.
17
18 Uyar, A. & Güngörmüş, A.H. (2011). Factors associated with student performance in
19 financial accounting course. *European Journal of Economic and Political*
20 *Studies*, 4(2), 139-154.
21
22
23
24
25 Voelkel, S. & Bennett, D. (2014). New uses for a familiar technology: introducing
26 mobile phone polling in large classes. *Innovations in Education and Teaching*
27 *International*, 51(1), 46-58.
28
29
30 Zepke, N. (2015). Student engagement research: thinking beyond the mainstream.
31 *Higher Education Research & Development*, 34, 1311-1323.
32
33
34 Zahller, K.A. (2017). Truffle in paradise: Job costing for a small business. *Journal of*
35 *Accounting Education*, 39, 32-42.
36
37
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Table 1. Descriptive statistics and correlation matrix

Variables	Mean	SD	1	2	3	4	5	6	7	8
1. Final grade	5.57	2.70	1							
2. Prior interest	4.05	1.10	.295**	1						
3. Study time	3.27	1.79	-.013	.158	1					
4. Attendance	4.61	0.84	.145	.383**	.052	1				
5. Participation	2.94	1.04	.335**	.265**	.127	.034	1			
6. Course usefulness	3.89	0.91	.279**	.359**	-.028	.245**	.255**	1		
7. Gender	0.58	0.50	.043	.090	.156	.123	-.036	.010	1	
8. Prior academic achievement	6.38	1.37	.193*	-.048	-.069	.137	.084	-.083	.061	1

Note: Significant at: ** p < 0.01; * p < 0.05 N = 152.

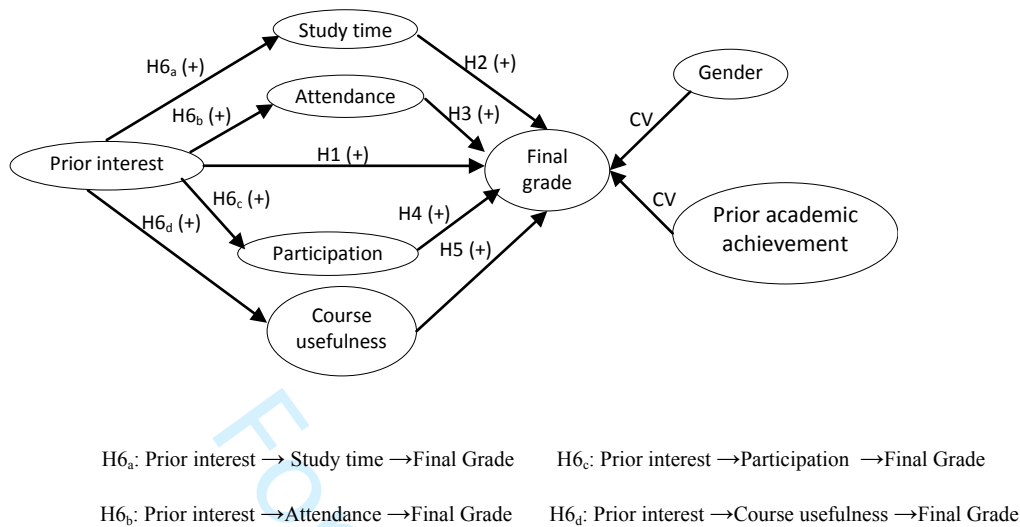


Figure 1. Model with a multiple mediation effect (CV = Control variable)

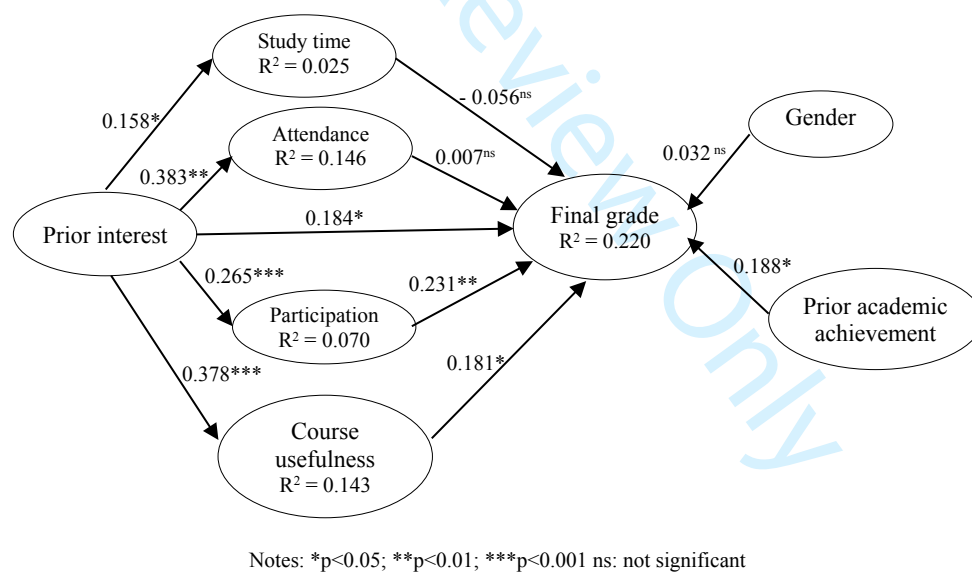


Figure 2. Results of the model with a multiple mediation effect

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We greatly appreciate the reviewers' comments and suggestions, which have helped us further improve the paper entitled "Key variables for academic performance in university accounting studies. A mediation model". We attach a revised version of the paper in which we have taken into account all the suggestions received. The changes made are shown in blue in the main text. In the following, we detail the changes made.

REVIEWER 1

1.1. The reviewer said: *"p. 2, line 1: add "s" to area; don't capitalise Finance and Accounting; leave out "studies" --> Previous research in the areas of finance and accounting has analysed".*

Response:
This suggestion has been carried out.

1.2. The reviewer said: *"p. 2 line 17: insert "the" --> the University of Granada".*

Response:
The change has been made.

1.3. The reviewer said: *«p. 6, line 19: instead of "questions" you might put a word like "relationships" or "effects"».*

Response:
The change has been made.

1.4. The reviewer said: *"p. 7, line 45: insert "This is" --> This is measured using....".*

Response:
This suggestion has been carried out.

1.5. The reviewer said: *"p. 8, line 17: I think there would have been a separate Likert scale for each variable, so suggest it might be more accurate to say: These three items were measure on five-point Likert scales".*

Response:
This suggestion has been carried out.

1.6. The reviewer said: *"p. 11, line 26: leave out the word "studies"».*

Response:
This suggestion has been carried out.

1.7. The reviewer said: *«p. 13, line 8: change "means" to "mean"».*

Response:
The change has been made.

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4 **1.8. The reviewer said:** *"p. 16: Kyndt et al. should be AFTER Kuh".*
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7 **Response:**

8 This correction has been made.
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