



Gender and learning results: a study on their relationship in entrepreneurship education and business plans

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This paper aims to analyse whether the entrepreneurial competencies acquired by students when they work on a business plan have any kind of influence on student learning process results in terms of gender. To do so, we used data obtained from questionnaires distributed among 425 students on the Bachelor's Degree in Business Administration at the X University. Comparing men and women, we performed exploratory factor analyses on competencies and learning process results, and linear regression analyses to determine the influence of gender and competencies on learning. Our findings indicated that women reported poorer learning results than men using the business plan methodology. Another key finding was the highly positive influence on learning process results of time-management and entrepreneurial competencies in particular. Finally, we found no significant differences between men and women in terms of the impact of competencies on learning process results.

Keywords: gender; business plan; higher education; entrepreneurial competencies; entrepreneurship education.

1. Introduction

The competency-based educational approach implemented by the Bologna Declaration (European Higher Education Area 1999) implies a shift of focus from contents to competencies, which have become a crucial element of the learning process (Author et al. 2014; Author and Author 2018). This new approach evaluates competencies as a result of learning and has promoted practical changes to the university model, affecting the organisation, objectives and activities of universities and adjusting the focus from acquisition of knowledge to acquisition of competencies (González and Wagenaar 2006). Accordingly, European universities have adopted European Higher Education Area (EHEA) guidelines, including competencies and skills in their programmes in an effort to create closer links between universities and society and meet the needs of the

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3 job market (Author et al. 2011).
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5 These reforms have attracted considerable attention from researchers, who have
6
7 been studying the role of competencies in the teaching-learning process (Author et al.
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9 2014, 2015; Author and Author 2018) and its implementation in higher education
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11 (Koenen, Dochy, and Berghmans 2015). Moreover, assessing the competencies gained
12
13 in the course of higher education has moved to centre stage in many countries (Lincoln
14
15 and Kearney 2015).
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19 In the field of business studies, entrepreneurial competencies—which include
20
21 personal initiative, self-learning and enterprise development—emerge as key elements
22
23 that promote employability and exert a relevant impact on the emergence of new
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25 businesses and on company growth and success (Bakkali, Messeghem, and Sammut
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27 2010; Sánchez 2011; Servicio Público de Empleo Estatal 2016). Previous research has
28
29 defined and identified entrepreneurial competencies (Bird 1995; Chandler and Jansen
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31 1992; Michelmore and Rowley 2010), demonstrated their relevance (Carrier 2009;
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33 Lans, Hulsink, and Baert 2008; Sánchez 2011; Taatila 2010) and analysed their
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35 development at different levels (Cárcamo-Solís et al. 2017), as well as the pedagogy and
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37 learning methodologies used to develop them (Loué, Laviolette, and Bonnafous-
38
39 Boucher 2008). These studies have highlighted the prevalence of business plans (Carrier
40
41 2009; Author et al. 2019; Honig 2004) and have considered different aspects and
42
43 characteristics of real or fictitious business plans to argue for their effectiveness in
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45 competency acquisition (Author et al. 2019; Honig 2004; Peterman and Kennedy 2003;
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47 Sánchez 2011; Tounés, Lassas-Clerc, and Fayolle 2014).
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54 One aspect that has remained largely unexplored is the effectiveness of business
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56 plans in terms of their learning value, and whether or not the competencies developed
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58 by them are translated into real learning results. A number of conflicting opinions
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3 question the existence of an unequivocal link between competencies and learning,
4 emphasising that not all competencies may exert the same impact on learning. These
5 different degrees of impact could depend on the different dimensions of learning, as
6 well as on the role of students and tutors, or how they specifically apply and use each
7 learning methodology (Author and Author 2018). These critiques underline the scarcity
8 of knowledge of which competencies are most effective in terms of learning with
9 different learning methods (Author et al. 2015).

19 Another unexplored aspect of previous research is related to the gender
20 dimension in the learning value of business plans in entrepreneurship education. Gender
21 differences have long attracted the attention of researchers in the fields of education,
22 management and entrepreneurship. In education, and higher education in particular,
23 gender differences influence student learning behaviour (Vecchione, Alessandri, and
24 Marsicano 2014) and performance (Chen, Yang, and Hsiao 2016), as well as their
25 competencies and skills. In the fields of management and entrepreneurship, the gender
26 dimension has also attracted the attention of researchers due to its influence on
27 proactive risk-taking, a fundamental behaviour involved in encouraging new ventures,
28 and one which has been argued to be more prevalent in men than women (Croson and
29 Gneezy 2009; Nielsen and Huse 2010; Saint-Michel and Wielhorski 2011). Although
30 this argument would suggest that women are less entrepreneurial than men, the greater
31 barriers and obstacles typically faced by women in the workplace may function as an
32 incentive for them to become more entrepreneurial (Martín-Ugedo and Minguez-Vera
33 2014). Previous research offers no consensus on the influence of gender on
34 entrepreneurship education, which involves complex considerations like the differences
35 between men and women when they learn. Certainly, more empirical evidence is
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3 needed to have a clearer idea of the influence of the gender dimension on
4 entrepreneurship education.
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8 After all these statements, our objective in this paper is three-fold. We first
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10 analyse how the acquisition of competencies through business plans influence student
11 learning process results. We then go on to determine whether the gender dimension
12 affects the learning process results of students using business plans. Finally, this
13 relationship between competencies and learning is compared between men and women.
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19 These objectives contribute to previous research by providing evidence related
20 to the effects of business plans on learning results, which has not previously been
21 explicitly analysed. To do so, the educational value of competencies acquired through
22 business plans will be considered. The influence of gender will also be considered,
23 which will contribute to further understanding of the role of gender in entrepreneurship
24 education.
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34 **2. Literature review**

35 ***2.1. Entrepreneurial competencies and learning results***

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38 According to the general concept of competency, competencies are a set of knowledge,
39 abilities, attitudes and characteristics that enable effective and successful work
40 performance (Bartlett and Ghoshal 1997; Mitchelmore and Rowley 2010).
41 Entrepreneurial competencies is the term used to refer to the set of competencies needed
42 to start or transform enterprises (Bird 1995). Therefore, entrepreneurs or individuals
43 who start or transform a business presumably have entrepreneurial competencies
44 (Mitchelmore and Rowley 2010). Entrepreneurial skills promote employability and add
45 value through the organisation of resources and opportunities (Bird 1995), and include
46 personal initiative, self-learning, and enterprise development (Servicio Público de
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3 Empleo Estatal 2016).

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5 Despite the considerable amount of research conducted on entrepreneurial skills,
6
7 it is still difficult to find a precise definition of them, and an ongoing debate exists on
8
9 the question of equivalence between entrepreneurial competencies and the skills needed
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11 by entrepreneurs.
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15 Chandler and Jansen (1992) distinguished three main families of competencies
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17 needed by entrepreneurs: managerial, technical/functional and entrepreneurial. Thus,
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19 entrepreneurial competencies are only one of several types of competency needed by
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21 the entrepreneur, though there is agreement in the literature (Bakkali, Messeghem, and
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23 Sammut 2010; Sánchez 2011) on the relevance of these to start up and transform
24
25 enterprises.
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29 More recently, Mitchelmore and Rowley (2010), having considered different
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31 frameworks proposed by previous research (Chandler and Jansen 1992; Man, Lau, and
32
33 Chan 2002; Smith and Morse 2005), indicated a list of key competencies that
34
35 entrepreneurs should have, and divided them into four groups that included
36
37 entrepreneurial skills, business and management skills, human relations skills and
38
39 conceptual and relationship skills. Penchev and Salopaju (2011) added a fifth group,
40
41 which included attitudes and characteristics.
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45 A solid learning foundation is required for these competencies to be properly
46
47 acquired (Lans, Hulsink, and Baert 2008; Kakkonen 2011; Pfeifer and Borozan 2011).
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49 Therefore, entrepreneurship teaching needs dynamic methodologies to help future
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51 entrepreneurs develop the competencies they will need to start and transform businesses
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53 successfully (Sánchez 2011; Sitzmann et al. 2010). Business plans are one of the
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55 methodologies typically used in entrepreneurship education.
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3 Previous research has emphasised the value of business plans, considered
4 essential for completing projects successfully and for increasing the chances of success
5 in new business, especially in the start-up phase (Brinckmann, Grichnik, and Kapsa
6 2010; Giunipero, Denslow, and Melton 2008). This methodology enhances the
7 reflection and planning skills of students (Ashamalla, Orife, and Abel 2008; Barringer
8 and Gresock 2008; Honig 2004), helps them to face risks, and improves their
9 entrepreneurial competencies (Tounés, Lassas-Clerc, and Fayolle 2014).

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11
12 However, despite previous studies having defended the usefulness and
13 effectiveness of business plans, little attention has been paid to their learning value on
14 the basis of how the competencies developed by them are translated into learning
15 process results.

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18 Vincett and Farlow (2008), for example, state that the educational value and
19 effectiveness of business plans depend on the students' motivation and the time they
20 spend carrying out the projects, emphasising contingent factors that should be
21 considered in relation to the educational effectiveness of this methodology.

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24 Other studies have previously explored the connection between competencies
25 and learning process results using other learning methodologies, and on the basis of the
26 multiple dimensions of both variables and the different impact that could be expected
27 depending on the dimensions considered. For example, Author et al. (2015) explored
28 the link between the generic competencies acquired by students using business games
29 and learning process results, focusing on three of their dimensions in particular: value,
30 satisfaction and meeting of expectations. Their findings confirmed that most of the
31 generic competencies influenced the different learning results separately but without
32 any coincidence between their dimensions, which means that the competencies that
33 affect one dimension of learning are different from those that affect others. Similar
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3 conclusions were obtained by Author and Author (2018) in their studies on the
4 influence of student interactivity on learning results, underlining that some skills are
5 more connected to learning results than others when different dimensions of learning—
6 such as learning objectives, learning process, expectations and satisfaction—are
7 considered.
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12 To sum up, there is a scarcity of knowledge as to the impact of competencies on
13 learning process results, because it is a complex and multifaceted phenomenon. This is
14 particularly true in the case of entrepreneurial competencies, as it is possible that not all
15 competencies exert the same impact on the different dimensions of learning. As such,
16 more empirical evidence on this link is needed, which leads us to establish the first
17 hypothesis addressed by this study:
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22 *H1: Entrepreneurial competencies acquired through a business plan impact*
23 *learning process results.*
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28 Researching this hypothesis will allow us to determine the most valuable
29 entrepreneurial competencies in terms of learning.
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32 33 **2.2. The role of gender in entrepreneurship education**

34 35 **2.2.1. Gender, management and entrepreneurship**

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38 Management literature has addressed its attention to the obstacles that women must
39 overcome in the business world, with particular reference to issues such as the gender
40 pay gap or the glass ceiling that prevents women from reaching the top rung of the
41 corporate ladder (Burke 1997; Singh and Vinnicombe 2004). Another relevant stream of
42 research analyses female characteristics in the business field as distinct from those of
43 men, looking into the impacts such differences may cause. These highly varied impacts
44 are examined through different theoretical lenses and approaches, and affect different
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3 dimensions of management, including entrepreneurship.
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6 When the role women play in entrepreneurial activity is examined, results
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8 indicate it is quite generalised worldwide for men to be more involved in
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10 entrepreneurship than women (Langowitz et al. 2005). One of the main components
11
12 behind this phenomenon is mostly based on the notion of different gender roles that
13
14 assumes women are more risk-averse and have less appetite for risk than men (Nielsen
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16 and Huse 2010). In their study, Croson and Gneezy (2009) offer some explanations for
17
18 the gender difference in risk taking, based firstly on differences in emotional reactions
19
20 to risky situations, because women report more intense fear than men in anticipation of
21
22 negative outcomes and, therefore, will be more risk-averse when facing risky situations.
23
24 A second reason for gender differences in risk attitudes is overconfidence. In this
25
26 regard, literature has found that men are more overconfident about their success in
27
28 uncertain situations than women (Barber and Odean 2001), and that firms run by female
29
30 CEOs engage in less corporate risk-taking (Faccio, Marchica, and Mura 2016). Finally,
31
32 men are more likely to see a risky situation as a challenge that calls for participation,
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34 while women interpret the same situation as a threat to be avoided.
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41 Opposing forces also exist to encourage the involvement of women in new
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43 ventures, however. Homosocial practices and similarity bias in the company recruitment
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45 process (Fitzsimmons 2012; Stafsuud 2006), based on the psychological inclination for
46
47 men to hire others similar to themselves in terms of gender, age, experiences, cohort and
48
49 background (De Anca and Gabaldon 2014; Fitzsimmons 2012), explain many of the
50
51 barriers faced by women in the business field. These barriers could cause women to
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53 view entrepreneurship as an alternative to employment and a means to fulfil their
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55 professional expectations (Brush et al. 2006), especially in middle and low-income
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57 countries, where the lack of job opportunities is more evident (Langowitz et al. 2005).
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2.2.2. *Gender in entrepreneurship education*

The first step to successful entrepreneurship is training and acquisition of entrepreneurial competencies. In this sense, a number of differences can also be observed in relation to how men and women learn, as well as their specific abilities and learning characteristics.

In particular, educational research scholars have widely documented analytical, mathematical and scientific skills' association with masculinity (Due 2014; Gonsalves, Danielsson, and Petterson 2016; Kahn 2009), while social, communication and organisational skills are generally associated with femininity (Archer, Pratt, and Phillips 2001; Due 2014; Kahn 2009). Wolfle and Williams (2014) also determined differences between men and women in terms of how they learn and in their learning performance.

In the specific case of entrepreneurial education, many scholars have pointed out its relevance in acquiring entrepreneurial skills and the existence of gender differences in the process. For example, the work of Komulainen, Korhonen, and Rätty (2009) in Finnish schools showed that boys matched the cultural values representation of the autonomous, risk-taking, entrepreneurial individual more closely than girls. Similarly, a gender-aware study conducted in eleven Latin American universities by Villasana, Alcaraz-Rodríguez, and Álvarez (2016) endorsed the relevance of entrepreneurship education for developing and strengthening entrepreneurial competencies. In their study, self-confidence was found to be the same for men and women, but creativity, problem management and risk management were reported to be higher for men. Rauth (2014) also found that getting the right entrepreneurial education, such as through professional training and skills development programmes, encourages women to take up entrepreneurship as a career and helps them in starting up their ventures. More recently, Nowiński et al. (2019) showed that although women generally have lower

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3 entrepreneurial intentions, they benefit more than men do from entrepreneurship
4 education. López-Delgado, Iglesias-Sánchez, and Jambrino-Maldonado (2019) also
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6 proved that gender influences the choice of university studies, with effects on
7
8 entrepreneurial intention.
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12 Other studies have voiced conflicting opinions regarding the lower level of
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14 entrepreneurial competencies among women. One such study is that by Kakkonen
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16 (2011), who, when considering gender as a segmentation variable, indicated few
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18 differences between men and women in their perception of entrepreneurial skills, or the
19
20 one by Kolvereid (1996), who asserted that women perceive themselves to have greater
21
22 entrepreneurial skills than men. Other scholars have questioned the role of education in
23
24 acquiring entrepreneurial competencies, especially in the case of women. For example,
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26 Do Paço et al. (2015) compared the entrepreneurial behaviour and intention scores
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28 recorded among girls attending a business school, where entrepreneurship education is
29
30 deeply imbedded in the curriculum, and boys attending a sports school. The results
31
32 showed that even though the boys at the sports school did not receive any kind of
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34 entrepreneurship education, they still tended to have a greater intention of starting up a
35
36 business. Similarly, Shinnar, Hsu, and Powell (2014) showed that current
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38 entrepreneurship education programmes may not be effectively reaching females and
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40 may need to be redesigned. More recently, Vivakaran and Maraimalai (2017) exposed
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42 the lack of adequate education and appropriate training among women entrepreneurs in
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44 India.
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51 These inconclusive results from previous studies show the need to provide more
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53 empirical evidence and further our understanding of the role of gender in
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55 entrepreneurial education. Therefore, we establish the following specific hypotheses:
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3 *H2: The learning process results achieved by men and women when using*
4 *business plans are different.*

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7 *H3: The impact of competencies on learning process results differs when*
8 *comparing women and men.*
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10 11 12 13 **3. Methodology**

14 15 16 17 **3.1. Data collection**

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20 The data used for this study was collected from students in different courses on the
21 Bachelor's Degree in Business Administration and Management at the X University;
22 specifically, students enrolled on the entrepreneurship specialisation of the final
23 bachelor's degree project course during the second semester of the 2014/15, 2015/16
24 and 2016/17 academic years. For the most part, the same tutors supervised the
25 development of the bachelor's degree projects during the three academic years. In order
26 to enhance the objectivity of the evaluation process, these tutors were provided with an
27 agreed rubric, which contained a detailed description of the criteria and standards for
28 evaluating each of the different activities during the course. The use of a rubric favours
29 the reliability and validity of the results, as the criteria used in the students' assessment
30 are homogeneous (Stevens and Levi 2013).
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45 In order to obtain information about students' perception of competency
46 achievement and the learning process results acquired through the development of a
47 business plan, a self-administered questionnaire was designed and sent to students via
48 an online classroom link.
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54 This research was performed using a one-off questionnaire, mainly because our
55 aim was not only to assess the potential improvement of students' entrepreneurial
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3 competencies and learning results after working on a business plan, but also to evaluate
4 these competencies' impact on students' learning processes in terms of gender.
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8 Students can only enrol on the final bachelor's degree project course, which is a
9 degree programme's final course, if they have already passed the rest of the degree's
10 subjects. The fact that this is the last part of their academic training suggests that
11 participant students already had high levels of competency, at least the levels required
12 to graduate, which could have biased the students' perception of their competencies
13 prior to having participated in the business plan. Therefore, we decided to perform a
14 one-off questionnaire, specifically designed to ascertain the competencies, skills and
15 attitudes developed with the support of the business plan, excluding any potential
16 effects that the students' other circumstances could have. Consequently, the
17 questions were formulated in the following way: "State your degree of agreement with
18 the following statements regarding the competencies, skills and attitudes that the
19 business plan has helped you develop or acquire". This way, when answering the
20 questionnaire, participants focused their assessment exclusively on the business plans'
21 effect, excluding other external factors (Fu, Su, and Yu 2009). This approach has also
22 been used by previous research focused on analysing the impact of student
23 competencies, skills and motivation on their perceived learning when using
24 methodologies similar to that of business plans (Borrajó et al. 2010; Buil, Catalán, and
25 Martínez 2018; Tiwari, Nafees, and Krishnan 2014).
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49 Finally, the questionnaire was completed by a total of 425 students. As the final
50 bachelor's degree project is a mandatory degree course and the questionnaires had to be
51 filled in and delivered, this constituted the total population.
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55 The first part of the questionnaire includes questions to gather information on
56 the characteristics of the population, such as gender, age, previous experience in
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3 creating companies, and the typology of business plan, whether real or fictitious. The
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5 second and third parts correspond to the generic and specific managerial competencies
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7 obtained from the items included in the White Paper of the Bachelor's Degree in
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9 Economics and Business Administration (ANECA 2005). These items have been used
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11 by previous research focused on assessing the generic and specific competencies of
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13 students enrolled on Economics and Business Administration degrees to analyse the
14
15 effectiveness of different learning tools, such as business simulation games (Author et
16
17 al. 2014; 2018). These studies conducted Cronbach's α tests to evaluate the internal
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19 consistency and reliability of generic and specific managerial competencies, obtaining
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21 alpha values above 0.7 (Cronbach 1942).
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26 The fourth and fifth parts refer to the cross-disciplinary competencies and
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28 specific entrepreneurial competencies obtained from the official report on this particular
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30 qualification (X University Bachelor's Degree in Business Administration and
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32 Management). The final part of the questionnaire includes seven questions to assess the
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34 learning process results of the students who took part in the business plan in terms of
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36 the value that students place on business plans, their satisfaction, their expectations,
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38 their learning objectives, their consideration of the business plan as a good learning tool
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40 and their entrepreneurial development. The items were extracted from different
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42 constructs already used in previous research and related to the results of the learning
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44 process. This is the case with perceived effective learning (Tiwari, Nafees, and
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46 Krishnan 2014), which includes learning objectives and business development;
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48 satisfaction (Buil, Catalán, and Martínez 2018), which includes value and satisfaction;
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50 and learning outcomes (Author and Author 2018), which considers expectations. All the
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52 items are evaluated using a 5-point Likert scale (from 1 'Strongly disagree' to 5
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3 ‘Strongly agree’). The competencies and learning process results are described in Table
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5 1.

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7 [Table 1 near here]

8 9 10 11 **3.2. Measurement of variables**

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14 The competencies acquired by students and their learning process results were measured
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16 using an exploratory factor analysis with varimax rotation to reduce the large number of
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18 competencies into a few interpretable underlying factors and consider all the results as a
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20 whole.
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23 Factor analysis was applied to the different typologies of competencies. The
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25 generic competency factor analysis generated three factors: decision making (F11),
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27 attitude and ICT (F12), and time management (F13), with a total variance explained of
28
29 63.9%. The cross-disciplinary competency factor analysis generated two factors of
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31 individual work (F31) and teamwork (F32), with a total variance explained of 63.919%.
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33 The factor analysis for the specific managerial competencies and specific
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35 entrepreneurial competencies generated only one factor each (F21 and F41), with a total
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37 variance explained of 56.185% and 58.63%, respectively.
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41 The factor analysis over the learning process results supports one factor (F51)
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43 with a total variance explained of 62.855%.
44

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46 The results for the explanatory factor analysis and the Cronbach’s alpha
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48 coefficients of each factor are shown in Table 2. The internal consistency and reliability
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50 of the measures are guaranteed, since the Cronbach’s alpha test (Cronbach 1942) gave
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52 values over the lower acceptance limit of 0.70 (De Vellis and Dancer 1991).
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55 [Table 2 near here]
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Therefore, the independent variables of this study are the seven competency-related factors labelled as *Decision Making*, *Attitude and ICT*, *Time Management*, *Management*, *Individual Work*, *Teamwork*, and *Entrepreneurship*.

Gender is also included as an independent variable of this study, measured through a dichotomous variable where 0 indicates men and 1 indicates women. With regard to the dependent variable, which is *Learning Process Results*, as mentioned earlier, we use the composite index extracted from the exploratory factor analysis conducted.

In addition, the study considers five controls. The *Typology* variable controls when the business plan is based on a fictitious (value=0) or real company (value=1); this makes sense since the typology of business plan could be a differentiating element (Author and Author 2016; Tounés, Lassas-Clerc, and Fayolle 2014) capable of affecting the learning results. The study also includes *Experience* (Peterman and Kennedy, 2003), another characteristic frequently related to *Typology*, because prior experience in the creation of companies could influence the achievement of better learning results with business plans. *Group* refers to the development of the business plan within a team. All are measured by dichotomous variables, with '0' indicating an absence and '1' indicating presence of the characteristic. Finally, *Age* is also included, and defined as a categorical variable with 4 levels in terms of quartiles, where 0 indicates students aged between 22 and 29; 1 indicates students aged between 30 and 32; 2 indicates students aged between 33 and 40; and 3 indicates students aged between 41 and 61 years of age.

Table 3 shows the sample's frequency and percentage with respect to the *Gender* and control variables.

[Table 3 near here]

As shown in Table 3, the gender distribution of the students who participated in this study was practically equal (55.3% of the population were men and 44.7% were

women). Most of the business plans corresponded to fictitious companies (64.9%) and the majority of students did not have previous entrepreneurial experience (78.5%). A large percentage of the students decided to develop an individual business plan, with only a few (8.7% of the population) developing the business plan within a team. Finally, the population was quite homogeneously distributed among the four age cohorts, although there were slightly more students in the cohort for 22 to 29 year olds.

4. Results

Table 4 presents the means, standard deviations and bivariate correlations. To address any potential problem of multicollinearity between explanatory variables, Variance Inflation Factors (VIF) analyses have been included for each model (Table 4), showing maximum values far below the upper bound of 10, which suggests an absence of unacceptable multicollinearity.

[Table 4 near here]

Table 5 shows the results of the regression analyses performed, which considered three different models. Model 1 includes the *control variables* and explains 1.6% of the variance in the data. Model 2 incorporates the influence of *gender* and *competency factors*. This model explains 56% of the variance. Finally, Model 3 adds the interaction terms between *competency factors* and *gender* and explains 55.8% of the variance.

[Table 5 near here]

The aforementioned regression allows us to compare and contrast the impact of gender and competencies developed by the business plan on students' level of learning process results.

Model 1 establishes that the only significant variable that affects learning process results is *typology*. *Typology* has a positive impact, so students who develop a

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3 business plan based on a real idea report better learning process results, though this
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5 model shows a very low R^2 value.
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8 The findings of Model 2 illustrate that most of the variables exert a significant
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10 effect on learning process results. *Gender* has a negative impact, which enables us to
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12 state that women report lower learning process results than men in the business plan.
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14 Moreover, all competency factors, except those related to specific competencies, are
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16 positively related to the learning process results of the business plan. These positive
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18 relationships allow us to say that acquiring competencies related to decision-making,
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20 attitude and ICT, time management, individual work and cross-disciplinary teamwork
21
22 competencies, and specific entrepreneurial competencies have a positive influence on
23
24 the students' assessment of their learning process results. Additionally, the analysis of
25
26 the standardised coefficients shows that abilities linked to time management and
27
28 entrepreneurial competencies present the greatest influence on learning process results
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30 (0.233 and 0.266, respectively).
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36 Model 3 establishes the moderating effect of gender on the relationship between
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38 competencies and learning process results, but the results do not support this effect. As
39
40 we can see in Model 3, the coefficients of these interaction terms are not statistically
41
42 significant in any case. From these results, we can conclude that women reported poorer
43
44 learning results than those of men when using a business plan, although significant
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46 differences in the impact of competencies on learning process results were not observed
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48 when we compared men and women.
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52 53 **5. Discussion and conclusions**

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55 Research into entrepreneurship education has received a great deal of attention.
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57 However, the development of entrepreneurial competencies and the quantification of the
58
59 achievement of learning process results in an entrepreneurship education environment
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3 has been neglected by previous research. The principal aim of this study has been to
4
5 analyse how competencies developed in a business plan affect student learning process
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7 results, taking into account the impact of gender as a factor that could influence the
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9 learning process using business plans.
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12 Until now, the literature has not paid specific attention to the relationship
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14 between competencies and learning results, considering them a single phenomenon
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16 within the learning process. In the field of entrepreneurial education, for example, a
17
18 number of studies, such as those of Correa, Hurtado, and Cardona (2011) or Robles and
19
20 Zárrega-Rodríguez (2015), focused on entrepreneurial capacity learning. These works
21
22 indicated that managing risk, searching, identifying, organising and making adequate
23
24 use of information, focusing on results, creativity, and innovation are the most relevant
25
26 competencies in relation to entrepreneurship, and this is partially consistent with the
27
28 results obtained in our study, with the exception of information ability. In these studies,
29
30 however, the acquisition of competencies is itself considered as a learning outcome.
31
32 This is justified by elements common to both and the interaction between them.
33
34 Nevertheless, we believe it is relevant to emphasise their differences. By separating
35
36 them, we are able to extend our analyses of the learning process using business plans,
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38 contemplate different dimensions of learning results, and analyse the different impacts
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40 that competencies may exert on these. Although similar studies have been conducted
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42 using other methodologies, such as business simulation games (Author et al. 2015;
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44 Author and Author 2018), to our knowledge there is no prior work that analyses the link
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46 between competencies developed by a business plan and learning results.
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54 Most of the previous research has focused on analysing the effectiveness of
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56 business plans in relation to new ventures creation (Correa, Hurtado, and Cardona 2011;
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58 Krueger and Brazeal 1994; Robles and Zárrega-Rodríguez 2015). This approach
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3 requires time, however, since new businesses are rarely created overnight; it also
4
5 neglects cases in which students effectively learn how to manage a new business, even
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7 if they do not create one immediately. With the present work, we aim to overcome these
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9 problems by analysing the impact of competencies acquired through business plans on
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11 student learning processes. Although our work has some limitations, described at the
12
13 end of this section, we consider the analyses performed to have provided several
14
15 interesting results and contributions.
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19 With regard to the first hypothesis, *Entrepreneurial competencies acquired*
20
21 *through a business plan impact learning process results*, our findings confirm that
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23 competencies acquired through business plans have a positive effect on learning.
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25 Hypothesis H1 is therefore supported. Moreover, we identified time management and
26
27 entrepreneurial competencies as the two competencies that exert the greatest impact.
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29 Our results are partially consistent with those of previous research focused on other
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31 learning methodologies, such as business simulation games. For example, Author et al.
32
33 (2015) found that, among others, competencies such as processing and analysing
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35 information, decision-making, applying theoretical knowledge to decision-making, time
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37 management, using new technologies and innovating, exert a specific influence on
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39 learning results. Similar conclusions were also extracted by Author and Author (2018)
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41 in their study on business simulation games: they found that the most relevant
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43 competencies affecting learning results were generic ones, such as information
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45 processing, decision-making, teamwork, dealing with uncertainty, and reaching
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47 agreement. Learning results in this case were described in terms of learning objectives,
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49 learning process, students' expectations and satisfaction. Some similarities can be
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51 observed between these competencies acquired through business games and those
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53 developed by business plans, with a high impact on learning results.
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3 However, our findings also indicated that learning process results were not
4 affected by specific competencies. This result related to the use of the business plan
5 methodology is partially consistent with that of Author and Author (2018) in their study
6 of business simulation games, in which they indicated that the most relevant
7 competencies affecting learning results were generic ones, while only a few specific
8 managerial competencies appeared to be relevant in terms of learning results. A possible
9 justification for this could be the fact that these specific competencies are closely
10 connected to a number of competencies perceived by students to be unconnected or of
11 no value to the business plan, such as risk management and strategies, financial
12 information, and ethics.
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26 With regard to hypotheses H2 and H3, which considered the gender dimension:
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28 *The learning process results achieved by men and women when using business plans*
29 *are different, and The impact of competencies on learning process results differs when*
30 *comparing women and men, our results confirm that women reported poorer learning*
31 *results than men when using business plans in terms of value, satisfaction, students'*
32 *expectations, learning objectives, acceptance of the business plan as a good learning*
33 *tool and entrepreneurial development. Hypothesis H2 is therefore also supported. This*
34 *result is in line with the poor entrepreneurial activity developed by women in*
35 *comparison to men (Langowitz et al. 2005; Rodrigues et al. 2010; Urbano 2006). For*
36 *instance, the 2018 Global Entrepreneurship Monitor (GEM) reported that the Total*
37 *Early-Stage Entrepreneurial Activity (TEA) rate was equal for men and women in only*
38 *six of the 49 countries monitored. Europe and the North American region have many*
39 *economies with a lack of gender equality. In general, the TEA rate for men is higher*
40 *than for women (Bosma and Kelley 2019). Therefore, as previous studies have also*
41 *highlighted, more efforts are needed to provide women with adequate education and*
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3 appropriate training to foster entrepreneurship (Vivakaran and Maraimalai 2017). This
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5 could mean using training and learning methodologies more adapted to the needs of
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7 women, and taking into account the deficiencies and difficulties faced by women when
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9 it comes to improving entrepreneurial education.
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13 However, our findings in terms of the impact of competencies on learning
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15 process results fail to confirm differences between men and women, and, accordingly,
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17 hypothesis H3 is not supported. This result agrees with those of previous research that
18
19 found no appreciable differences in the perception of entrepreneurial competencies
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21 between men and women (Kakkonen 2011), though most of the studies in this field
22
23 have emphasised that men outperform women in term of entrepreneurial competencies
24
25 (Komulainen, Korhonen, and Rätty 2009; Villasana, Alcaraz-Rodríguez, and Álvarez
26
27 2016). Having said that, our work goes a step further, analysing not only entrepreneurial
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29 competencies but considering the impact of these competencies on the whole learning
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31 process. Thus, independently of who has more competencies, no differences were
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33 perceived between men and women in terms of how these competencies affect learning
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35 process results.
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41 This research has its limitations, nevertheless. We have only considered the
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43 students' own perceptions in our analysis of their acquisition of competencies and
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45 learning results. Even if it is not a limitation in itself, the inclusion of other sources of
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47 information, such as assessments made by tutors on the business plan courses, could
48
49 improve the reliability of our conclusions and provide the opportunity to make
50
51 comparisons between students' perceptions and their tutors' evaluations. The use of
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53 other learning methodologies in entrepreneurial education could also give us a more
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55 holistic view of how entrepreneurial competencies are acquired, the effect they have on
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57 the learning process, and differences related to gender.
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Table 1. Competencies and learning process results

6	Generic competencies
7	[C1] Process and analyse a body of general information referring to a company
8	[C2] Process and analyse partial information referring to parts of a company
9	[C3] Make decisions
10	[C4] Draw conclusions from the information obtained or provided
11	[C5] Relate information or data
12	[C6] Apply theoretical decision-making concepts
13	[C7] Manage time
14	[C8] Solve problems related with deadlines
15	[C9] Use new technologies
16	[C10] Creativity
17	[C11] Capacity for innovation
18	[C12] Ability to work with uncertainty
19	Specific managerial competencies
20	[C13] Improve a company's competitive position
21	[C14] Develop strategies
22	[C15] Manage risk
23	[C16] Process and analyse financial information
24	[C17] Identify and work with sources of relevant financial information
25	[C18] Integrate ethics in organisational decisions
26	Cross-disciplinary competencies
27	[C19] Show attitudes and behaviours that are consistent with ethical, responsible professional practice
28	[C20] Search, identify, organise and make adequate use of information
29	[C21] Optimally organise and plan the professional activity
30	[C22] Interpret and assess the information critically and synthetically
31	[C23] Work as a team, in on-site or online environments, in multidisciplinary environments
32	[C24] Negotiate in a professional environment
33	[C25] Communicate correctly, verbally and in writing, both in the native and a foreign language, in academic and professional spheres
34	[C26] Use and apply information and communication technologies in academic and professional spheres
35	[C27] Undertake entrepreneurial ventures and innovate
36	Specific entrepreneurial competencies
37	[C28] Understand the workings of the economy, its agents and institutions, with particular emphasis on corporate behaviour
38	[C29] Generate relevant economic knowledge from data, applying the appropriate technical tools
39	[C30] Efficiently manage a company or organisation, understanding its competitive and institutional position and identifying its strengths and weaknesses
40	[C31] Efficiently perform administrative and management tasks in any key company or organisational area
41	[C32] Critically evaluate specific business situations and establish possible business and market evolutions
42	[C33] Plan, manage and evaluate business projects
43	[C34] Focus on results, meeting internal and external customer requirements
44	Learning process results
45	[R1] My participation in the business plan is valuable

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3 [R2] I have achieved my learning objectives after developing the business plan
4 [R3] The business plan is a good learning tool
5 [R4] I am satisfied with the learning experience
6 [R5] The business plan has met all my expectations in terms of learning
7 [R6] The business plan has exceeded my expectations in terms of learning
8 [R7] The business plan has helped me develop my entrepreneurial capacity
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Table 2. Results of the factor analysis

Competencies and results	Factors							
	F11	F12	F13	F21	F31	F32	F41	F51
C1	0.790	0.160	0.097					
C2	0.827	0.083	0.100					
C3	0.538	0.430	0.212					
C4	0.597	0.405	0.211					
C5	0.710	0.308	0.275					
C6	0.468	0.404	0.407					
C7	0.184	0.158	0.882					
C8	0.234	0.205	0.844					
C9	0.037	0.556	0.404					
C10	0.242	0.753	0.157					
C11	0.202	0.791	0.088					
C12	0.318	0.656	0.154					
C13				0.739				
C14				0.799				
C15				0.765				
C16				0.730				
C17				0.748				
C18				0.713				
C19					0.613	0.384		
C20					0.811	0.099		
C21					0.828	0.069		
C22					0.808	0.079		
C23					0.082	0.893		
C24					0.222	0.867		
C25					0.598	0.393		
C26					0.616	0.439		
C27					0.674	0.266		
C28							0.762	
C29							0.763	
C30							0.800	
C31							0.805	
C32							0.776	
C33							0.730	
C34							0.719	
R1								0.778
R2								0.841
R3								0.802
R4								0.880
R5								0.869
R6								0.779
R7								0.555
α -Cronbach	0.851	0.746	0.836	0.842	0.866	0.801	0.882	0.893

Note: Decision making (F11), attitude and ICT (F12), management (F21), time management (F13), individual work (F31), teamwork (F32), entrepreneurship (F41), learning process results (F51).

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Table 3. Distribution by *Gender* and control variables

Variables		Frequency	Percentage
Gender	Male	235	55.3
	Female	190	44.7
Typology	Fictitious	276	64.9
	Real	149	35.1
Experience	No	334	78.5
	Yes	91	21.5
Group	No	388	91.3
	Yes	37	8.7
Age	22-29	127	29.9
	30-32	89	20.9
	33-40	109	25.7
	41-61	100	23.5
Total		425	100

Table 4. Descriptive statistics and correlation matrix

Variables	Mean	s.d.	1	2	3	4	5	6	7	8	9	10	11	12	13
1.Group	0.09	0.282	1												
2.Typology	0.45	0.498	-.02	1											
3.Experience	0.35	0.478	-.03	.15**	1										
4.Age	0.22	0.412	0.07	.13**	.15**	1									
5.Gender	0.09	0.282	-.01	-.05	-.24**	-.01	1								
6. F11	0	1	-.01	.13**	0.05	.10*	0.01	1							
7. F12	0	1	0.02	0.03	0.00	-.05	0.02	0.00	1						
8. F13	0	1	-.00	0.02	-0.08	0.08	0.08	0.00	0.00	1					
9. F21	0	1	-.04	.13**	.11*	0.06	-.00	.53**	.46**	.28**	1				
10. F31	0	1	-.12*	.09*	0.05	-.04	0.03	.56**	.39**	.27**	.71**	1			
11. F32	0	1	.19**	0.03	0.09	0.04	-.02	0.01	.28**	.28**	.35**	0.00	1		
12. F41	0	1	-.06	.12*	0.06	0.05	-.00	.52**	.42**	.35**	.78**	.74**	.29**	1	
13. F51	0	1	-.02	.12*	0.05	0.08	-.05	.40**	.38**	.40**	.61**	.58**	.31**	.67**	1

Notes: N = 425; ** Correlation is significant at 0.01 (bilateral); * Correlation is significant at 0.05 (bilateral).

Table 5. Regression analysis: determinants of learning results

	Model 1		Model 2		Model 3	
	β	t	β	t	β	t
Group	-0.003	-0.048	0.009	0.249	0.010	0.275
Typology	0.155**	2.787	0.055	1.460	0.054	1.423
Experience	0.028	0.500	-0.006	-0.147	0.001	0.031
Age	0.014	0.256	0.023	0.603	0.019	0.489
Gender			-0.086*	-2.267	-0.086*	-2.260
F11			0.165**	3.071	0.132†	1.713
F12			0.173***	3.575	0.175**	2.671
F13			0.233**	5.198	0.238**	3.603
F21			0.011	0.152	-0.043	-0.416
F31			0.155*	2.225	0.218*	2.365
F32			0.125**	2.754	0.089	1.434
F41			0.266***	3.843	0.259**	2.766
F11*Gender					0.060	0.758
F21*Gender					0.006	0.095
F31*Gender					-0.002	-0.035
F21*Gender					0.092	0.945
F31*Gender					-0.128	-1.290
F32*Gender					0.055	0.924
F41*Gender					0.018	0.179
VIF	1.059		3.821		7.956	
Adjusted R ²	0.016		0.560		0.558	
F	2.311†		36.256***		23.115***	

Notes: All coefficients are standardised beta weights and t-values are also given.

*** $p < 0.001$; ** $p < 0.01$; * $p < 0.05$; † $p < 0.1$