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Assessment of entrepreneurial orientation and its relationship with gender and academic performance

Evaluación de la orientación emprendedora y su relación con el género y el rendimiento académico

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ABSTRACT

Entrepreneurial orientation is a key concept in the organizational context that is becoming increasingly important in the educational field, since the promotion of entrepreneurship has become one of the European Union's main areas of action in relation to education. Given that the *Escala de Orientación Emprendedora* - Entrepreneurial Orientation Scale (EOE) is one of the few instruments that enable the assessment of entrepreneurial orientation among students, the first aim of the present study was to adapt it to Basque and validate it in that language (EOE-E). The second aim was to examine the relationship of entrepreneurial orientation with gender and academic performance. The sample comprised 735 students in vocational training. In relation to the first aim, the Confirmatory Factor Analysis corroborated

the six-factor structure of the original questionnaire, presenting acceptable internal consistency and stability over time indexes. Evidence of convergent validity and evidence of validity based on relations with other variables, such as self-efficacy and personal initiative was also obtained. The results therefore confirm that evidence was obtained of validity and reliability of the instrument for assessing entrepreneurial orientation among students in vocational training. In terms of the second aim, men were found to have higher mean scores than women for competitiveness, whereas women scored higher than men for learning orientation. Furthermore, in comparison with their lower-performing counterparts, students with better academic grades scored higher for innovativeness, proactiveness, achievement orientation and learning orientation.

Keywords: entrepreneurial orientation, entrepreneurship, test adaptation, gender, academic performance, vocational training

RESUMEN

La orientación emprendedora es un concepto clave en el contexto organizacional que está adquiriendo una relevancia cada vez mayor en el ámbito educativo, ya que la promoción del emprendimiento se ha convertido en una de las líneas de acción más importantes de la Unión Europea en materia de educación. Dado que la Escala de Orientación Emprendedora (EOE) es uno de los pocos instrumentos que permiten evaluar la orientación emprendedora en estudiantes, el primer objetivo del presente estudio consistió en la adaptación al euskera y la validación de la EOE (EOE-E). El segundo objetivo fue examinar la relación de la orientación emprendedora con el género y con el rendimiento académico. La muestra estuvo compuesta por 735 estudiantes de Formación Profesional. En cuanto al primer objetivo, el Análisis Factorial Confirmatorio corroboró la estructura de seis factores del cuestionario original, presentando índices aceptables de consistencia interna y estabilidad temporal. Se recabaron evidencias de validez convergente y de relación con otras variables, tales como la autoeficacia y la iniciativa personal. Por lo tanto, cabe afirmar que se obtuvieron evidencias de validez y fiabilidad de la EOE-E para la evaluación de la orientación emprendedora en estudiantes de Formación Profesional. En lo que respecta al segundo objetivo, los varones presentaron puntuaciones medias superiores a las de las mujeres en orientación competitiva, mientras que las mujeres superaron a los varones en orientación al aprendizaje. Además, en comparación con el estudiantado de menor rendimiento académico, los y las estudiantes con mejores calificaciones académicas mostraron una mayor orientación a la innovación, orientación proactiva, orientación al logro y orientación al aprendizaje.

Palabras clave: orientación emprendedora, emprendimiento, adaptación de test, género, rendimiento académico, formación profesional

INTRODUCTION

Several authors have pointed out that the study of entrepreneurship based solely on personality traits poses conceptual and methodological problems, since personality traits are usually static and theories based on them tend to underestimate the influence of situational factors on actions (Athayde, 2009). In light of this, and given the importance of taking in account those aspects of entrepreneurial competence that can be learned and developed, the present study focuses on the construct known as entrepreneurial orientation (EO), which was initially conceptualized in the organizational environment.

The theoretical antecedents of EO date back to Mintzberg (1973), who defined entrepreneurship as a willingness to search for new opportunities in spite of uncertainty. However, it is the work of Miller (1983) that is largely acknowledged as laying the groundwork for the construct. According to this author, an entrepreneurial company is one that is committed to market innovation, willing to engage in risky activities and determined to discover and implement innovations in a proactive manner. This definition highlights innovation, risk-taking, and proactiveness, the same aspects that have traditionally been identified as the dimensions of EO. In the organizational environment, innovation refers to a company's predisposition to engage in innovative initiatives, experimentation and creative actions that may lead to new products, services or technological processes. Risk-taking is conceived as the willingness to engage in daring actions and earmark meaningful resources in unknown and uncertain environments. Proactiveness is defined as the search for opportunities and a vision of the future characterized by a desire to develop new products and services that anticipate future market trends. Based on Miller's classification (1983), Lumpkin and Dess (1996) broadened the concept of EO and proposed a new classification that included two additional dimensions: competitive aggressiveness and autonomy. Competitive aggressiveness is defined as the tendency to try and outperform one's competitors in order to enter or improve one's position in a market. Autonomy refers to independent actions carried out by leaders or teams with the aim of putting into practice an idea that seeks to identify new opportunities. Some years later, Krauss et al. (2005) revalidated Lumpkin and Dess' classification and incorporated two more dimensions into their theoretical model of EO: learning orientation and achievement orientation. Achievement orientation refers to the constant establishment of challenging goals and persistence in achieving said goals. Learning orientation, on the other hand, alludes to a desire to learn from both positive and negative experiences.

Although the concept of EO has traditionally been associated with the organizational context, over recent years much interest has arisen in studying EO in the educational field (Gorostiaga et al., 2019). This interest is linked to the fact

that entrepreneurial skills and attitudes can be learned and may, in turn, lead to the development of an entrepreneurial culture that benefits individuals, organizations and society in general (Bacigalupo et al., 2016). Indeed, the development of entrepreneurial capacities among European citizens and organizations has become one of the key political aims of the European Union and its Member States (Bacigalupo et al., 2016). Currently, the European Commission defines entrepreneurial competence as one of the eight key competences required for lifelong learning (European Commission, 2019).

In the educational field, it is important to distinguish between the concept of EO, the concept of entrepreneurial potential and the concept of entrepreneurial intention. EO can be defined as the psychological orientation of those who often come up with innovative and creative ideas for solving problems, and tend to be proactive, autonomous and competitive in diverse aspects of their lives, accepting the risks involved in their decisions and maintaining a clear orientation towards achievement and learning (Gorostiaga et al., 2019). Bernal-Guerrero and Cárdenas-Gutiérrez (2017) define entrepreneurial potential as the set of capacities an individual may develop during the formation of their entrepreneurial identity, and point out that it is comprised of several different indicators, including autonomy, initiative, creativity and cooperative spirit. For her part, Athayde (2009) identified five dimensions of entrepreneurial potential, namely: creativity, leadership, intuition, achievement and personal control. Finally, entrepreneurial intention can be defined as a mental state that directs an individual's attention and actions towards situations of self-employment, as opposed to situations of being employed (Fayolle & Gailly, 2015).

The conceptualization of the dimensions of EO in the educational field is, in general, based on the original definitions developed in the organizational environment (Krauss et al., 2005; Lumpkin & Dess, 1996; Miller, 1983), although a change of reference is necessary to ensure that they refer to teaching activities and other everyday activities, rather than specifically to business-like initiatives. For example, Bolton and Lane (2012) point out that some students are more innovative and others less, some students take risks and others do not, some work autonomously and others prefer the comfort of a group, and some are very competitive and seek always to be top of their class, whereas others are happy just to pass. Consequently, with the logical adaptations and bearing in mind the individual nature of the construct in the educational field, the original definitions can be used to assess the dimensions of EO in education (Bolton & Lane, 2012; Kurniawan et al., 2019; Reyes et al., 2014).

As regards the association between EO and other relevant variables in both the organizational and educational fields, it is worth noting that several studies carried out in the entrepreneurial context have analyzed the relationship of this construct

with self-efficacy and personal initiative. Self-efficacy is defined as an individual's trust in their own ability to complete a task successfully (Bandura, 1977). This personal judgment plays a key role in motivation, which in turn determines an individual's effort and perseverance for achieving certain goals (Al Issa et al., 2019). Researchers in the field of entrepreneurship have defined entrepreneurial self-efficacy as an individual's trust in their own ability to successfully perform various roles and complete various tasks linked to entrepreneurship (Chen et al., 1998). EO has been found to be positively associated with both entrepreneurial self-efficacy (Crespo et al., 2020; Eniola, 2020) and general self-efficacy (Gorostiaga et al., 2019; Mohd et al., 2014). The concept of personal initiative was initially proposed by Frese et al. (1996) in the organizational field. Following several previous conceptualizations, Frese and Fay (2001) eventually defined personal initiative as the set of behaviors that characterize individuals who are entrepreneurial, proactive and persistent in the face of any obstacles that may arise in the pursuit of their goals. In the educational field, EO has been found to correlate positively with personal initiative (Gorostiaga et al., 2019; Koop et al., 2000; Krauss et al., 2005).

In contrast to the associations of EO with self-efficacy and personal initiative, which have been clearly reported in the extant literature, the results found to date in relation to gender have been inconsistent. Hardly any research has focused on the relationship between EO and academic performance, a key variable in the educational field. Several studies have reported that men have higher levels of EO than women (Bilić et al., 2011; Kee & Rahman, 2018), whereas others failed to find any gender differences at all (Hunt, 2016; Ogunleye & Osagu, 2014). Moreover, in those cases in which differences have been observed, they vary across the dimensions of EO. For instance, many studies have found that men score higher than women for innovation (Kee & Rahman, 2018; Reyes et al., 201). However, some authors observed no differences between men and women in this sense (Arham et al., 2020; Kumar et al., 2021). In terms of risk-taking, most studies report men scoring higher than women (Lim & Envick, 2013; Marques et al., 2018), although some found no gender differences in this dimension (Arham et al., 2020; Kumar et al., 2021; Reyes et al., 2014). As for proactiveness, some studies report women scoring higher than men (Marques et al., 2018), whereas others report the opposite (Arham et al., 2020; Kee & Rahman, 2018; Kumar et al., 2021). Finally, in relation to competitive aggressiveness and autonomy, most studies report that men score higher than women for both these aspects (e.g., Lim & Envick, 2013). In this sense, it is interesting to note that a recent study in the educational field by Gorostiaga et al. (2019) found gender differences in two out of the six dimensions of EO analyzed, specifically competitiveness, in which men scored higher than women, and learning orientation, in which women scored higher than men.

As stated earlier, only a few studies have focused on the association between EO and academic performance. In one of these, the authors observed that proactiveness, innovativeness and autonomy were positively associated with academic performance (Phelan et al., 2013). In another, Rivai et al. (2018) found a positive correlation between academic performance and EO, whereas Ramesh et al. (2018) found an inverse relationship between these two same variables.

We previously referred to the association between EO and variables such as self-efficacy and personal initiative. Several studies have shown that EO has a positive impact on students' entrepreneurial intention and mediates the relationship between entrepreneurial education and this same variable (Otache et al., 2022; Pérez et al., 2022). This serves to highlight the importance of EO in the educational context, which is why it is vital to be able to assess it in a precise and adequate manner. Despite this, however, most of the instruments that are available for measuring this construct have been developed and are used in the organizational context, with only a very few being available in the educational field. Moreover, most of these have been validated with university students and are based on the three dimensions defined by Miller (1983) and Covin and Slevin (1989) (e.g., Mutlutürk & Mardikyan, 2018; Sulphey & Salim, 2021), the five dimensions defined by Lumpkin and Dess (1996) (e.g., Bolton & Lane, 2012; Kurniawan et al., 2019; Lee et al., 2011, adapted to Spanish by Boada-Grau et al., 2016), or another theoretical model (e.g., Athayde, 2009, adapted to Spanish by Bernal-Guerrero et al., 2021). In contrast, non-university students and the theoretical EO model proposed by Krauss et al. (2005) have hardly been taken at all as references for the development of instruments designed to assess EO in the educational field. Nevertheless, we believe that, in the educational context, the achievement orientation and learning orientation dimensions of said theoretical model are of particular importance. In keeping with this approach, a recent study developed an EO questionnaire called the *Escala de Orientación Emprendedora* - Entrepreneurial Orientation Scale -EOE- (Gorostiaga et al., 2019). This instrument is innovative in that it is the only one based on the dimensions of EO proposed by Krauss et al. (2005), even though, following the validation process, the autonomy dimension was eliminated due to inadequate functioning. Moreover, the scale was validated with vocational training students, a population that is close to accessing the labor market. We therefore believe that the scale is a useful instrument for assessing EO in the educational field.

As well as being validated in the sector in which the target construct is designed to be measured, an assessment instrument should also be adapted to the cultural context in which it is to be used. Based on this conviction, and bearing in mind that 20.5% of the population in the Autonomous Community of the Basque Country (Spain) speaks Basque as their first language (Basque Government, 2019), the main aim of the present study was to adapt the Entrepreneurial Orientation Scale (EOE;

Gorostiaga et al., 2019) to the Basque language and culture. Given that no instrument exists to assess EO in Basque, the present study seeks to fill an important gap in the Basque education sector. Furthermore, since the results obtained to date regarding gender have been inconsistent, we believe it is important to continue exploring the differences that may exist between men and women in the educational context in relation to EO. Finally, given the importance of academic performance in this context and the fact that the research community has paid very little attention to date to the link between this variable and EO, we also aim to analyze this association here. The exploration of possible differences in EO in accordance with gender and academic performance is therefore the second aim of the present study.

METHOD

Participants

We accessed a list of all vocational training centers in the Autonomous Community of the Basque Country through the Basque Government's General Directorate of non-University Teaching Centers. A series of strata were defined on the basis of qualification level (advanced and intermediate) and type of center (public or private), and the centers in each of the four resulting categories were then sorted into a random order. In the academic year in which the sample was recruited, 59% of students were enrolled on advanced-level vocational training courses, 56% in public training centers and 44% in private ones; and 41% were enrolled on intermediate-level vocational training courses, 63% in public training centers and 37% in private ones. In order to ensure that the sample was representative, our aim was to obtain a minimum sample size of 500 people, based on the assumption that 20 students from each selected vocational training center would agree to voluntarily participate in the study. We contacted 112 centers to invite them to participate. Of these, 66 ran advanced-level courses and 46 intermediate-level courses. Of the former, 37 were public and 29 private; and of the latter, 29 were public and 17 private. The sample selection procedure was therefore random and stratified, with proportional and cluster-based allocation. A favorable response was received from 9 centers (7 public and 2 private) running advanced-level vocational training courses and 5 centers (4 public and 1 private) running intermediate-level vocational training courses. The definitive sample comprised 735 vocational training students (322 women, 388 men, 25 of non-specified gender) aged between 16 and 53 years (M = 20.42; SD = 5.32). Participants were enrolled on 30 different advanced (50.1%) and intermediate-level (49.9%) courses at 14 vocational training centers in the Autonomous Community of the Basque Country (Spain); 62.2 %

were studying at public centers and 54.1 % had previous work experience. The distribution of the sample across the 12 different professional areas identified was as follows: Health (19.4 %), Mechanical Manufacturing (18.5 %), Social-cultural and Community Services (18.3 %), Administration and Management (9.2 %), Installation and Maintenance (7.3 %), Physical and Sporting Activities (6.1 %), IT and Communications (4.8 %), Personal Image (4.7 %), Commerce and Marketing (3.6%), Agriculture (2.9 %), Electricity and Electronics (2.6 %) and Hospitality and Tourism (2.5 %).

Instruments

Basque version of the Entrepreneurial Orientation Scale (EOE-E)

This scale comprises 31 items that assess six dimensions of EO: (a) Innovativeness (e.g., "I like innovative teachers more than traditional ones"); (b) Risk-taking (e.g., "In order to create something of value, you need to take risks"); (c) Proactiveness (e.g., "I take the initiative whenever I have the opportunity to do so"); (d) Competitiveness (e.g., "I usually compete with my classmates"); (e) Achievement orientation (e.g., "I get a special feeling whenever I achieve a goal (in my studies, in sport, etc."); and (f) Learning orientation (e.g., "I like people who never stop learning"). Responses are given on a five-point Likert-type scale ranging from 1 (Totally disagree) to 5 (Totally agree). The original version of the instrument was found to have adequate psychometric properties. Specifically, evidence was found supporting a six-dimension structure and attesting to gender invariance and convergent validity with the Entrepreneurial Attitude Scale (Gorostiaga et al., 2019).

Basque version of the Scale for Measuring Personal Initiative in the Educational Field (EMIPAE-E; Gorostiaga et al., 2018).

This scale comprises 17 items that assess three dimensions of personal initiative: (a) Proactiveness and prosocial behavior (e.g., "I am willing to learn from the experiences and knowledge of my teachers and classmates"); (b) Persistence (e.g., "When faced with changes and/or difficulties in the classroom/workshop/laboratory, my level of effort drops" - reverse-scored item); and (c) Self-starting (e.g., "I usually try to put the ideas I have in the classroom/workshop/laboratory into practice"). Responses are given on a five-point Likert-type scale ranging from 1 (Totally disagree) to 5 (Totally agree). In the present study, the internal consistency indexes (McDonald's omega) were .86, .82 and .71, respectively, for the Proactiveness-Prosocial Behavior, Persistence and Self-starting dimensions.

Entrepreneurial Attitude Scale (Roth & Lacoa, 2009)

This is a unidimensional instrument that assesses entrepreneurial attitude through a set of statements linked to proactiveness, propensity to excellence, effectiveness seeking, trust in success, and resilience. It comprises 15 items (e.g., "I am not afraid to take on new initiatives) rated on a four-point Likert-type scale ranging from 1 (Totally disagree) to 4 (Totally agree). The instrument has adequate psychometric properties (Roth & Lacoa, 2009). In a previous study (Balluerka et al., 2014), minor modifications were made to six of the items to adapt them to the cultural context of the Basque Country. In the present study, we used this modified version and the internal consistency index (McDonald's omega) was .86.

General Self-Efficacy Scale (Baessler & Schwarzer, 1996; Spanish adaptation by Sanjuán et al., 2000)

This instrument assesses perceived personal competence in dealing effectively with a wide variety of stressful situations. It comprises 10 items (e.g., "I can always manage to solve difficult problems if I try hard enough") rated on a ten-point Likert-type scale ranging from 1 (Totally disagree) to 10 (Totally agree). The Spanish adaptation has adequate psychometric properties (Sanjuán et al., 2000). In the present study, the internal consistency index (McDonald's omega) was .88.

Sociodemographic questionnaire

This questionnaire was developed ad hoc for the present study in order to collect information on gender, age, training center, academic level (intermediate or advanced), the professional area to which the course being studied belonged, course, academic performance, previous work experience, and profession (in the case of having had previous work experience).

Procedure

First, the items were adapted to the Basque-speaking population, following the standards accepted by the scientific community (Hernández et al., 2020). The items of the EOE-E were translated from Spanish to Basque using a direct-reverse translation design. To this end, each item in the Spanish version was translated into Basque independently by two people who were fluent in both languages and familiar with both cultures, and who had previously been trained in the basic

psychometric aspects linked to item construction. The two translations were then compared and discussed until a consensus version was obtained for each item. This consensus version in Basque was then translated back into Spanish independently by another two people with the same characteristics as those who carried out the direct translation, and a consensus version was reached using the same method. Finally, the four members of the translation team compared each of the items in the original and reverse-translated versions of the instrument to analyze any possible lack of equivalence regarding meaning, and made the necessary modifications to the final Basque language version of the instrument.

This version was then used in a pilot study with a sample of 178 vocational training students (46.6% men) enrolled on nine different courses in three centers located in the Autonomous Community of the Basque Country. Of these, 59% had previous work experience. A series of quantitative analyses were carried out in this pilot study. Specifically, we calculated the mean, standard deviation, homogeneity index and non-response percentage for each item. The means varied in accordance with the dimension to which the items belonged, with the highest values being found in the Achievement orientation (M = 4.03) and Learning orientation (M = 4.19) dimensions, and the lowest ones being found in the Competitiveness dimension (M = 2.73). As regards standard deviations, with the exception of four items with deviations of less than 0.8, all the others had a value close to or over 1 (with the mean of all deviations being 0.95). The mean homogeneity index was .45, with only four items having values under .30, although in two cases the index was very close to the established cut-off value. The proportion of missing data was under 5% for all items. A series of qualitative analyses were also carried out, in which participants were asked to indicate any terms they did not understand. The number of terms identified was very low. Finally, two items were redrafted as a result of their homogeneity indexes and because the authors believed they contained terms that needed to be modified in order to improve comprehension.

Finally, the Basque version of the Entrepreneurial Orientation Scale (EOE-E) was administered, alongside the instruments required for its validation, to a broad, representative sample of participants. All participants completed the battery of questionnaires in group sessions in their respective vocational training centers. In all cases, participants' informed consent was obtained prior to administering the battery of questionnaires. To protect their anonymity, participants were randomly assigned a numerical code that they were asked to indicate at the top of each instrument. The instruments were administered in the following order: sociodemographic questionnaire, EOE-E, EMIPAE-E, Entrepreneurial Attitude Scale and General Self-Efficacy Scale.

The study was approved by the Ethics in Research and Teaching Commission at the University of the Basque Country (UPV/EHU).

Data analysis

With the aim of analyzing the dimensions of the EOE-E, different Confirmatory Factor Analysis (CFA) models were tested. The Weighted Least Squares Mean and Variance adjusted (WLSMV) method was used as estimation method. The Comparative Fit Index (CFI), the Tucker-Lewis Index (TLI) and the Root Mean Square Error of Approximation (RMSEA) were used as goodness of fit indexes. In the case of the CFI and the TLI, values of over .90 are deemed to indicate good fit. In relation to the RMSEA, values of under .08 indicate acceptable fit, and values of under .06 indicate good fit (Hu & Bentler, 1999).

For the reliability analysis, first, we estimated the internal consistency of each of the dimensions of the EOE-E using McDonald's omega coefficient, and second, we calculated the stability over time of the instruments using the Pearson correlation coefficient. Stability over time was analyzed in a sub-sample of 84 participants, with a time interval of four weeks between the first and the second administration of the instrument.

To obtain evidence of the convergent validity of the EOE-E, we calculated the Pearson correlation coefficients between the scores obtained by participants in the different dimensions of the scale, and those obtained in the Entrepreneurial Attitude Scale (Roth & Lacoa, 2009). Evidence of validity based on relations to other variables was obtained by calculating the Pearson correlation coefficients between the EOE-E dimensions and the EMIPAE-E dimensions, as well as between the EOE-E dimensions and the General Self-Efficacy Scale.

Finally, in order to fulfil the second aim of the present study, gender differences in the dimensions of the EOE-E were analyzed, along with differences between participants with high (grades awarded: high merit or distinction) and low (grades awarded: pass or fail) academic performance. These comparisons were carried out using Student's *t*-test. Cohen's *d* was calculated to estimate the effect size of the differences observed.

The descriptive analyses were performed using the M-Plus (v. 8.0) and SPSS (v. 26) software packages.

RESULTS

First, we present the results of the adaptation of the EOE to the Basque language, followed by the results pertaining to the study's second aim.

Aim 1: Dimensional structure

Table 1 shows the goodness of fit indexes of the CFA models tested. The unidimensional CFA was found to have poor fit. The six-factor CFA, tested in order to confirm the structure of the Spanish version of the instrument, had a better fit than the unidimensional model. Nevertheless, the modification indexes indicated that the fit of this model could be improved by allowing item 18 to be part of several dimensions. The decision was therefore made to allow this item to weigh in two of them. Moreover, item 28 was eliminated for weighing in several different dimensions. The fit of this last modified model was close to acceptable. The standardized factor loadings resulting from this model are presented in Table 2. All loadings were statistically significant and over .40, except for those corresponding to items 13 and 20, which were above the .30 threshold.

Table 1
Goodness-of-fit indexes of the CFA models

Models	χ^2 (*df*)	CFI	TLI	RMSEA (90% CI)
1-dimension CFA	3993.6 (464)	.55	.51	.102 (.099-.105)
6-dimension CFA	1554.51 (449)	.86	.84	.058 (.055-.061)
Modified 6-dimension CFA	1270.55 (418)	.89	.87	.053 (.049-.056)

Note. χ^2: Chi squared; *df*: degrees of freedom; CFI: Comparative Fit Index; TLI: Tucker-Lewis Index; RMSEA: Root Mean Square Error of Approximation; CI: Confidence Interval.

Table 2

Standardized factor loadings resulting from the modified 6-dimension CFA model

Items	F1	F2	F3	F4	F5	F6
Item 6	.661					
Item 13	.378					
Item 18	.417					
Item 25	.681					
Item 1		.556				
Item 7		.430				
Item 8		.485				
Item 17		.685				
Item 29		.677				
Item 5			.669			
Item 16			.520			
Item 18			.449			
Item 27			.781			
Item 2				.633		
Item 3				.581		
Item 9				.446		
Item 19				.588		
Item 20				.302		
Item 24				.663		
Item 30				.637		
Item 10					.481	
Item 11					.591	
Item 14					.583	
Item 23					.589	
Item 31					.437	

Items	F1	F2	F3	F4	F5	F6
Item 4						.585
Item 12						.588
Item 15						.634
Item 21						.503
Item 22						.621
Item 26						.530
Item 32						.679

Note. Appendix 1 presents the items of the EOE-E in Basque, along with their English translation.

Aim 1: Reliability

Table 3 presents the means and standard deviations, along with the McDonald's omega indexes and the test-retest correlations for each dimension of the EOE-E.

Table 3
Reliability indexes for the EOE-E

Dimension	M(SD)	McDonald's omega	Test-retest correlation
Innovativeness	15.12 (2.66)	.65	.43**
Risk-taking	17.70 (3.26)	.71	.38**
Proactiveness	9.95 (2.19)	.73	.58**
Competitiveness	21.51 (5.58)	.76	.64**
Achievement orientation	19.39 (2.80)	.67	.56**
Learning orientation	28.46 (3.81)	.79	.60**

**$p < .001$.

Aim 1: Convergent validity

The Pearson correlation coefficients between the scores obtained in the six dimensions of the EOE-E and the Entrepreneurial Attitude Scale were .27, .25, .47, .24, .32 and .33 (p = .001), respectively, for the innovativeness, risk-taking, proactiveness, competitiveness, achievement orientation and learning orientation dimensions.

Aim 1: Correlations between the dimensions of the EOE-E and the EMIPAE-E dimensions and General Self-Efficacy Scale

Table 4 shows the Pearson correlation coefficients between the six dimensions of the EOE-E and the three dimensions of the EMIPAE-E (proactiveness-prosocial behavior, persistence and self-starting) and the General Self-Efficiency Scale. Said table reflects the positive, moderate correlations observed between innovativeness and the proactiveness-prosocial behavior dimension of personal initiative. Proactiveness, achievement orientation and learning orientation showed positive moderate correlations with proactiveness-prosocial behavior and self-starting dimensions of personal initiative. Proactiveness also correlated positively and moderately with self-efficacy. Other statistically significant correlations were observed, but none of them reached a moderate effect size ($r \geq .30$).

Table 4
Pearson correlations between EO dimensions and the dimensions of personal initiative and self-efficacy

	Personal initiative			Self-efficacy
	Proactiveness-prosocial behavior	Persistence	Self-starting	
Innovativeness	.40**	.23**	.20**	.22**
Risk-taking	.14**	-.07	.27**	.19**
Proactiveness	.39**	.06	.46**	.40**
Competitiveness	-.12*	-.20**	.27**	.14**
Achievement orientation	.40**	-.01	.39**	.14**
Learning orientation	.50**	.07	.36**	.18**

*$p < .05$; **$p < .001$.

Aim 2: Differences in Entrepreneurial Orientation based on gender and academic performance

In relation to the second aim of the present study, Table 5 presents the results of the comparisons between the mean scores obtained by men and women in the different EO dimensions.

Table 5
Mean scores, standard deviations, Student's t values and Cohen's d values in the comparisons between the scores obtained by men and women in the different dimensions of the EOE-E

	Gender	N	M	DT	Student's *t*	Cohen's *d*
Innovativeness	Women	322	15.58	2.61	3.98**	0.30
	Men	388	14.79	2.66		
Risk-taking	Women	322	17.79	3.30	0.58	0.04
	Men	388	17.64	3.20		

	Gender	N	M	DT	Student's *t*	Cohen's *d*
Proactiveness	Women	322	14.09	2.57	2.75*	0.21
	Men	388	13.54	2.74		
Competitiveness	Women	322	18.22	4.81	-6.21**	0.47
	Men	388	20.44	4.69		
Achievement orientation	Women	322	19.83	2.70	3.70**	0.28
	Men	388	19.05	2.88		
Learning orientation	Women	322	29.69	3.36	7.87**	0.59
	Men	388	27.53	3.85		

*$p < .05$; **$p < .001$.

As shown in Table 5, men obtained higher mean scores than women in competitiveness, whereas women scored higher in learning orientation. In the case of innovativeness, proactiveness and achievement orientation, although the gender differences observed were statistically significant, their effect size was small.

Table 6 presents the results obtained in the different EOE-E dimensions by students with high and low academic performance.

Table 6

Mean scores, standard deviations, Student's t values and Cohen's d values in the comparisons between students with high and low academic performance

	Performance	N	M	SD	Student's *t*	Cohen's *d*
Innovativeness	Low	158	14.56	2.59	-5.07**	0.59
	High	136	16.09	2.57		
Risk-taking	Low	158	17.94	3.32	-0.54	0.06
	High	136	18.14	2.89		
Proactiveness	Low	158	12.96	2.50	-5.71**	0.67
	High	136	14.63	2.49		

	Performance	N	M	SD	Student's *t*	Cohen's *d*
Competitiveness	Low	158	19.45	4.35	0.57	0.07
	High	136	19.14	5.04		
Achievement orientation	Low	158	18.77	2.71	-4.08**	0.48
	High	136	20.01	2.51		
Learning orientation	Low	158	27.53	3.49	-4.25**	0.50
	High	136	29.26	3.50		

**$p < .001$.

As shown in Table 6, students with high grades (high merit or distinction) scored higher for innovativeness, proactiveness, achievement orientation and learning orientation than their counterparts with low grades (pass or fail).

DISCUSSION AND CONCLUSIONS

The principal aim of the present study was to develop and validate the Basque version of the EOE (used to assess EO in the educational field), providing evidence of its validity and analyzing its reliability in a broad sample of vocational training students. The main results obtained indicate that the psychometric properties of the EOE-E are similar to those found for the original Spanish version.

In terms of the dimensions of the EOE-E, although the fit indexes obtained were slightly poorer than in the original version of the scale, the CFA confirmed the six-dimension structure of said version (Gorostiaga et al., 2019), with most of the items saturating clearly in their corresponding dimensions. The internal consistency indexes for the different dimensions also had slightly lower values than in the original version, as did the stability over time indexes for all six dimensions of the EOE-E, although all were acceptable. As regards the pattern of correlations observed between scores in the EOE-E dimensions and the Entrepreneurial Attitude Scale, we can state that said pattern provides evidence of the convergent validity of the Basque version of the instrument. As in the study by Gorostiaga et al. (2019), in the present study, the EO dimension that correlated most strongly with entrepreneurial attitude was proactiveness, along with (to a lesser extent) achievement orientation and learning orientation. This may be explained by the fact that the items of the Entrepreneurial Attitude Scale assess aspects such as proactiveness, propensity to excellence, effectiveness seeking, trust in success and resilience.

In terms of the evidence attesting to the validity of the instrument based on relations to other variables, consistently with that observed in several other studies (Crespo et al., 2020; Eniola, 2020; Mohd et al., 2014), the six dimensions of the EOE-E correlated positively with self-efficacy, although in our study, proactiveness was the only dimension that reached a moderate effect size. This finding coincides with that reported by Gorostiaga et al. (2019), who found that, in comparison with the rest of the dimensions, proactiveness explained most of the variance observed in self-efficacy. Consistently also with the results of previous research (Gorostiaga et al., 2019; Koop et al., 2000; Krauss et al., 2005; Nsereko et al., 2018), four of the dimensions of EO correlated positively and moderately with the proactiveness-prosocial behavior and self-starting dimensions of personal initiative. However, no important correlations were observed between any of the dimensions of EO and persistence. This finding may be due to the fact that the persistence dimension of personal initiative focuses more on stubbornness in the achievement of self-started goals, as well as on continuing to pursue an action despite difficulties and on the individual's determination to keep going (Frese & Fay, 2001).

In sum, the results obtained during the validation of the Basque language version of the EOE enable us to assert that, although the reliability indexes are slightly lower than those reported in the original version, the evidence indicates that the instrument is valid for assessing entrepreneurial orientation among Basque-speaking students in the educational context.

In terms of the second aim of the present study, statistically significant gender differences were observed in relation to all the dimensions of EO, with the exception of risk-taking, although said differences only reached a moderate effect size in two cases. Specifically, men scored higher than women in the competitiveness dimension, a finding that is consistent with that reported by previous studies (Gorostiaga et al., 2019; Lim & Envick, 2013); and women scored higher than men in the learning orientation dimension, in keeping with that reported previously by Gorostiaga et al. (2019). The absence of notable differences between men and women in the other dimensions of EO is consistent with the results reported by Hunt (2016) when analyzing the general entrepreneurial orientation construct in the educational field, as well as with the findings of studies focusing on differences in specific dimensions, such as innovativeness (Arham et al., 2020; Kumar et al., 2021) and risk-taking (Arham et al., 2020; Kumar et al., 2021; Reyes et al., 2014). These results suggest that the gender differences observed in the organizational context do not seem to be present to the same extent in the educational field.

In the case of academic performance, our results indicate that, in comparison with their lower-performing counterparts, students with higher academic grades scored higher for innovativeness, proactiveness, achievement orientation and learning orientation. Phelan et al. (2013) also observed a relationship between

academic performance and the proactiveness and innovativeness dimensions. This finding would seem to indicate that a future-oriented outlook, coupled with a willingness to participate and experiment, set goals and learn, is associated with good academic performance. Given the scarcity of studies reporting evidence on the relationship between academic performance and EO, we believe that this finding is novel and supports the viewpoint adopted by the European Commission, which regards entrepreneurial competence as one of the key competences required for lifelong learning.

The present study has some limitations that should be taken into account when interpreting the results. First, the data were obtained using a cross-sectional design, what affects the possibility of establishing causal relationships. Second, all the assessment instruments used were self-report measures. This may have resulted in a bias linked to the common variance method. Future studies may wish to consider the possibility of obtaining information from other sources also, such as teachers. Moreover, self-report measures may affect the honesty with which participants respond to the items, although when the construct being measured is not particularly sensitive in nature (as is the case here), self-reports are usually fairly accurate. Third, we were not able to determine whether or not differences existed in the dimensions of the EOE-E in accordance with the professional areas to which the vocational training courses on which participants were enrolled belong. Finally, since participants were all vocational training students, future studies may wish to try and replicate these results with high school and/or university students. This would provide additional evidence of the validity of the EOE-E and would broaden the scope of the conclusions drawn in relation to EO and its association with gender and academic performance.

To conclude, we would like to highlight the contributions made by the present study. From a practical perspective, it offers a new instrument which enables the EO construct to be assessed in the Basque language. EO is a key construct that should be included in all training programs and entrepreneurial education initiatives implemented in the educational field with the aim of fostering entrepreneurship, a competence that may, in the medium term, improve students' job prospects and future professional development. As such, it is vital to have valid, reliable instruments for measuring EO.

From a theoretical perspective, the present study provides additional evidence of the associations between the different EO dimensions and gender and academic performance, as well as confirming their relationship with self-efficacy and personal initiative. Over recent years, many studies have been carried out with university students, although fewer have focused on students at lower educational levels. Some of these have been carried out with primary and secondary school students (Bernal-Guerrero & Cárdenas-Gutiérrez, 2017). However, as Athayde (2009) argues,

it is increasingly important to orient business policies towards young people, which is why entrepreneurial culture should be fostered from very early on. The present study helps further our existing knowledge regarding entrepreneurial competence in vocational training, an educational level that is of great interest, since students enrolled on these courses are very close to entering the labor market.

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APPENDIXES

Appendix 1
EOE-E items and their English translation

Item	Basque version	English translation
	Innovativeness dimension	
6	*Irakaskuntza metodo berriak erabiliz gauzak modu desberdinean egiten dituzten irakasleak gustatzen zaizkit*.	I like teachers with a different approach and who make use of new teaching methods.
13	*Nahiago dut lanpostu errepikakorra eduki, lanpostu sortzailea baino*.	My goal is to have a job that is more about routine than creativity. (Reverse-scored item)
18	*Ideia berriak/berritzaileak sortzen diren taldeetan lan egitea eta parte hartzea gustatzen zait*.	I like to work and take part in groups where new or innovative ideas emerge.
25	*Gehiago gustatzen zaizkit irakasle berritzaileak tradizionalak baino*.	I like innovative teachers, more than traditional ones.
	Risk-taking dimension	
1	*Bizitzan arrakasta edukitzeko batzuetan arriskatu egin behar da*.	You have to take risks at times in order to be successful in life.
7	*Erabaki arriskutsuak hartzea gustatzen zait*.	I like to make risky decisions.
8	*Zerbait baliotsua sortzeko, aurretik huts egitea beharrezkoa da*.	In order to create something of value, you have to be prepared to make mistakes.
17	*Arrisku handiak hartzen dituzten pertsonak miresten ditut*.	I admire people who assume large risks.
29	*Zerbait baliotsua sortzeko, arriskuak hartu behar dira*.	In order to create something of value, you need to take risks.
	Proactiveness dimension	
5	*Iniziatiba hartzen dut horretarako aukera dudan bakoitzean*.	I take the initiative whenever I have the opportunity to do so.

Item	Basque version	English translation
16	*Askotan lehenengoa naiz klasean gauzak proposatzen*.	In class I'm often the first person to propose things.
18	*Ideia berriak/berritzaileak sortzen diren taldeetan lan egitea eta parte hartzea gustatzen zait*.	I like to work and take part in groups where new or innovative ideas emerge.
27	*Iniziatiba izatea gustatzen zait, egiten ditudan ia gauza guztietan*.	I like to take the initiative in almost everything I do.
	Competitiveness dimension	
2	*Nire gelakideekin lehiatu ohi naiz*.	I usually compete with my classmates.
3	*Niretzat lehiakorra izatea bertutea da*.	For me, being competitive is a good thing.
9	*Bizitza, oro har, lehia hutsa da*.	Life in general is all about competition.
19	*Askotan ahal dudan guztia egiten dut besteak gainditzeko*.	I often strive to be better than others.
20	Nahiago dut lehiatu beharrik ez izatea.	I prefer not to have to compete. (Reverse –scored item).
24	*Ikasleen artean lehiakortasuna sustatzen duten irakasleak gustatzen zaizkit*.	I like teachers who encourage competitiveness among their students.
29	Askotan nire ikaskideekin apustua egiten dut, beraiek baino hobea naizela zerbaitetan.	I often bet my classmates that I'm better than they are at something.
30	*Etorkizunean enpresari gisa ikusten naiz, beti lehiatzen*.	I see myself becoming a businessman/ woman and always competing.
28	--	
	Achievement orientation dimension	
10	*Zeregin batekin hasi aurretik, helburuak argi finkatzeko beharra dut*.	Before beginning a task I need to set myself some clear goals.

Item	Basque version	English translation
11	*Niretzat garrantzitsua da nire burua hobetzen saiatzea (ikasketetan, kirolean…)*.	Trying to do better (in my studies, in sport, etc.) is important to me.
14	*Emozio berezia sentitzen dut helburu bat lortzean (ikasketetan, kirolean…)*.	I get a special feeling whenever I achieve a goal (in my studies, in sport, etc.).
23	*Gustatzen zait erronka suposatzen duten helburuak jartzea (klasean, kirolean…)*.	I like to set myself goals that imply a challenge (in class, in sport, etc.)
31	*Helburu handi bat lortzeko, helburu txikiagoetan zatitzen dut*.	In order to achieve a goal I usually break it down into smaller objectives.
	Learning orientation dimension	
4	*Etengabe gauza berriak ikasteko aukera ematen didan lanpostua eduki nahiko nuke*.	My goal is to have a job where I am constantly learning new things.
12	*Akatsetatik ikasi egiten da*.	You learn from your mistakes.
15	*Bizitza etengabeko ikaskuntza da*.	Life is a constant learning process.
21	*Ikasteari inoiz uzten ez dion jendea gustatzen zait*.	I like people who never stop learning.
22	*Egunero gauza berriak ikasten saiatzen naiz*.	I try to learn new things every day.
26	*Enpresa ondo joateko, langileek etengabe ikasten aritu behar dute*.	For a company to be successful, its employees have to be learning all the time.
32	*Beti esperientzietatik ikasten saiatzen naiz*.	I always try to learn from my experiences.

Note. The original item numbering has been used.