



Psychometric properties and factor structure of a motivation scale for higher education students to graduate and stimulate their entrepreneurship

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Abstract

The purpose of this research work is to provide a measurement instrument, through the validation of a proposed scale, to determine the relevant factors that affect the motivation of university students, and that can be used as anticipatory indicators of personal entrepreneurship to achieve educational and work success. To carry it out, exploratory and confirmatory factor analyses have been carried out, based on the principal components' method, which have been validated through the usual model fit measures in the literature, considering an analysis of reliability and reliability of the measurement instrument. To obtain this purpose, a sample of the university population was selected, through a simple random sampling, considering heterogeneity of courses, subjects, areas, and teaching modalities, of 596 individuals, with a higher percentage of women compared to men, as can be seen from the total number of enrolled in university degrees in the Spanish education system. The scale proved to have good psychometric properties, obtaining good internal consistency and validity. Among the main findings, we can highlight several dimensions for motivation, for instance, emotional self-management and adversity management; and learning strategies, such as: active self-management of study material, study management and self-management of effort, among others. In conclusion, a scale has been validated to determine which dimensions should be considered to promote student motivation as a method of personal entrepreneurship, and which can be used by educational authorities to propose extracurricular training that affects the improvement of students' competence, both in academic and emotional management. The dataset was analyzed using exploratory and confirmatory factor analysis.

Keywords Motivation · Learning strategies · Exploratory and confirmatory factor analysis · Internal validity and consistency · Reliability · Higher education · Entrepreneurship

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Introduction

The effectiveness and efficiency of the use of public resources is a topic of great current academic interest (Jimenez, 2019). Considering university education, both in Spain and in most continental European countries, higher education institutions have a public character, funded mainly by states, through citizens' taxes, and with a modest share of training costs by students, around 20% of the real cost (Oroval & Escardíbul, 2011; Sempere & Calatayud, 2022; Oroval & Escardíbul, 2011). In this context, early dropout and the excessive number of years that university students take to graduate only add to the waste of states' financial resources.

According to the "Análisis del abandono de los estudiantes de Grado en las universidades presenciales en España" (translation into "Analysis of the dropout rate of undergraduate students in face-to-face universities in Spain") (Mellizo-Soto, 2022), 11% of students leave the university system without completing their studies, and 6% do so during the first year. Among the underlying factors and variables that can be identified in the study, we can highlight those that affect the student level, such as academic performance; those at degree level, exogenous to the students, such as tuition fees and family income; and, to a lesser extent, those at university level. It can be observed that academic performance in the first year is intrinsically related to the permanence in studies. Moreover, the socio-economic level of families is correlated with dropout when academic results are not good (Herbaut, 2020; Troiano et al., 2021).

The adaptation of university study programs according to the Bologna Plan, where the structures of teaching in terms of training and assessment must be carried out through the acquisition of competencies, skills, and abilities, meant a paradigm shift in higher education, focusing learning on the student and his or her ability to adapt to his or her environment (Montero Curiel, 2010). These new university programs incorporated a wide range of competencies and skills for the training of future professionals, as final goals, but they forgot to incorporate skills and tools to enhance academic success during their training. (Domenech et al., 2019) show how self-efficacy in education and emotional competence are variables of relevance for academic success, skills that are not fostered in higher education. Adequate management, promotion and training of socio-emotional skills leads to an increase in students' motivation to meet their achievement indicators (Villena Martínez et al., 2023).

Motivation and an adequate learning strategy are the basis for entrepreneurial university students to graduate from their studies, joining the labor market and, in this way, returning to society through their contribution to the public system the investment made in their training, fulfilling one of SDG4: Social-emotional learning goals "The student is able, through participatory methods, to motivate and empower others to demand and use educational opportunities", and Cognitive Learning Objectives "The learner conceives education as a public good, a common good, a fundamental human right and a basis for ensuring that other rights are fulfilled". The success rate in graduation is a good indicator of

the satisfactory use of public resources. As for the suitability rate in Spain, this stands at 38.4%, indicating the percentage of students who finish their studies within the established theoretical time, with an average duration of 4.9 years, and rising in Engineering degrees to 5.5 years (MU¹, 2022).

According to the Oposita Test portal and the Netquest Studies Service (Oposita Test, 2023), 74% of people residing in Spain between the ages of 18 and 55 consider "that being a civil servant allows you to have a better quality of life", and 51% are considering taking the exam to be. These results show that there are few economic incentives on the part of public administrations, little personal motivation of students to undertake, due to the insufficient promotion of entrepreneurial talent in educational institutions, and the risk aversion of individuals. Kan and Tsai (2006) find that the degree of risk aversion has a negative impact on the decision to become self-employed. That less risk averse individuals becomes entrepreneurs. Despite the existence of a growing number of studies that relate risk aversion to entrepreneurship with personality traits (extroversion, introversion, neuroticism, etc.) (Sahinidis et al., 2020; Tsaknis et al., 2022), few have addressed the study that entrepreneurial competence can be trained to achieve higher levels of entrepreneurial talent (Fairlie & Holleran, 2012). Other studies have shown that individuals' risk aversion to entrepreneurship is a mediating variable for the total effect of personality traits on entrepreneurial intent (Ahmed et al., 2022).

Entrepreneurship can be interpreted from several perspectives (Diandra & Azmy, 2020). Entrepreneurship as a discipline (Crocì Cassidy, 2016). Entrepreneurship as economic development (Hessels & Naudé, 2019). Entrepreneurship as a search for opportunities (He et al., 2020). Entrepreneurship as a skill and competence associated with talent (Nururly et al., 2018). Entrepreneurship as education to transform society (Ratten & Usmanij, 2020). Entrepreneurship as a skill and personal competence (Kyguolienė & Švipas, 2019). In our research, we address the study of motivation, through the development and validation of a questionnaire, as a socio-emotional skill that allows us to address the positive management of adversity and emotional management, as basic traits to foster talent and entrepreneurial spirit, aligned with (Kyguolienė & Švipas, 2019) personal skills.

The main goal of this research is to propose and validate a new motivation survey, with the questions adapted to learning strategies and motivation to remain in university studies, as well as the inclusion of some additional questions about their learning tools on the study of the psychometric properties of the scale proposed in (Zurita Ortega et al., 2019). To achieve the objective of validation of the proposed scale, exploratory factor analysis and confirmatory factor analysis techniques have been used, as well as measures of consistency and internal validity (Gill et al., 2022; Martínez-Líbano et al., 2022; Vucaj, 2022). Considering the relationship between the design of questionnaires in the educational field and their validation using factor analysis tools, the study by Schreiber et al. (2006) (in Moguerza et al., 2017) should be highlighted.

¹ MU: Ministry of Universities.

The main contribution of this research is to obtain a scale of measurement that allows higher education professionals to determine which most relevant aspects should be enhanced to students to achieve success in the completion of studies, and to offer an assessment of the socio-emotional skills of students that allows them to carry out training activities for emotional management and adversity management. Key aspects to promote talent and entrepreneurship. In addition, the results of the scale allow educational institutions to address the training of talent through motivation by increasing activities conducive to the management of emotions and improving achievement indicators. Curricular and extracurricular training that enhances students' socio-emotional skills to improve their motivation will result in a decrease in dropout rates and an increase in success rates.

This paper is organized as follows: "[Literature review](#)" section presents the literature review; "[Methodology and Materials](#)" section presents Methodology and Materials, including the description of the sample, the sampling procedure, a brief description of the instrument structure and, finally, the analysis techniques used; "[Results](#)" section describes the implementation of the methodology and the most salient results. "[Discussion and conclusions.](#)" section presents discussion, limitations and future research and the main conclusions.

Literature review

Personal entrepreneurial skills and education

It has been proven in the literature that entrepreneurs are made, not born (Paul Dana, 2001). Becoming an entrepreneur is a training process that begins, in many cases, at university. The creation of new academic study programs has incorporated the promotion and training of some of the skills for entrepreneurship (Bauman & Lucy, 2021), such as creativity, problem-solving, and risk management, but competencies on emotional management (Aly et al., 2021; Al-Tekreeti et al., 2024), or adversity management (Shepherd & Williams, 2020; Osiyevskyy et al., 2023) have not been incorporated. Academic programs focus on three types of skills (Gieure et al., 2020): technical skills, such as oral and written communication and organization; business management, as decision-making and marketing skills; and, personal skills, such as risk management and tenacity. However, the programs do not incorporate skills to foster entrepreneurship and personal development.

(Depositario et al. (2011) developed a questionnaire, called PEC (Personal Entrepreneurial Competence), to measure these competencies. Alusen (2016) conducted research on personal entrepreneurship competencies among CEOs of companies. (Reyes et al., 2018) conducted research on personal entrepreneurship competencies in students. Entrepreneurial competence, defined by (Driessen & Zwart, 2006), consists of knowledge, motivation, ability and personal characteristics. Alusen (2016) defined personal entrepreneurial competencies as the set of qualities and personality traits that make individuals more or less likely to become entrepreneurs, or at least predict their intention to become entrepreneurs. One of the most used classifications to classify personal entrepreneurial competencies are those developed by

Management System International (MSI) in 1989 (in (Kyguolienė & Švipas, 2019)): opportunity seeking, persistence, commitment to work contract, risk-taking, demand for efficiency and quality, goal seeking, information seeking, systematic planning and monitoring, persuasion and networking, self-confidence. These competencies are listed in (Depositario et al., 2011).

Entrepreneurship education can be defined as the process of practical application of knowledge, attitudes, skills, and competencies, not only of starting a new business, but fostering a learning environment that promotes personality traits and entrepreneurial behaviors, such as becoming a creative and independent thinker, taking risks, and taking responsibility (Gautam & Singh, 2015). Ndofirepi (2020) has found evidence on relationship between entrepreneurial education and entrepreneurial intentions through psychological traits, as risk-taking, and need for achievement. (Saif & Ghania, 2020) show the relationship between the need for achievement for entrepreneurship and motivation for achievement. In this way, the main contribution of this research work is to propose a scale as an instrument whose purpose is to determine the factors that affect the motivation for achievement to finish university studies, and that serves as an indicator to establish the need for achievement in entrepreneurship.

Motivation and learning strategies

Academic success in higher education at the end of these studies are the most important goals that university students set themselves in order to be able to integrate into the labor market in the best conditions. Identifying these factors that affect academic achievement has motivated much of the research in educational psychology (Mega et al., 2014). Most research has focused on the role that motivation, learning strategies, and emotional competence have on learning and academic performance (Pekrun et al., 2002, 2011). Most of this research has been approached from different analysis techniques, correlation analysis (Ravuse et al., 2017), qualitative analysis (Pekrun et al., 2002), experimental classroom approaches (Kramarski et al., 2002), structural equation models (Tokan & Imakulata, 2019; Hayat et al., 2020).

In the literature we can find different theories about motivation that could be applied in the learning process: intrinsic and extrinsic motivation theory (Ryan & Deci, 2000); self-determination theory (Ryan & Deci, 2020), the ARCS model (Keller, 1987), social cognitive theory (Bandura, 1989) and expectancy theory (Van Eerde & Thierry, 1996). Currently, the most accepted theories in the literature are based on the consideration of motivation as a set of intrinsic and extrinsic factors, and the theory of self-determination, as a broader concept, which emanates from the previous theory, and which includes personality traits, autonomy of individuals, their psychological wellness, and all issues of direct relevance to educational settings. Intrinsic factors are related to the cognitive and affective structure of the student. Regarding extrinsic factors, they refer to the structure of teachers and the performance of their educational work (Buzdar et al., 2017; Sánchez & Vargas, 2016; Sivrikaya, 2019).

Regarding learning strategies, (Weinstein et al., 2000) define them as "the different combinations of activities students use while learning, with greater variability over time or as any behaviors that facilitate the acquisition, understanding or later transfer of knowledge and skills". Pintrich et al. (1991) grouped these learning strategies into three basic aspects: cognitive, resource management and metacognitive strategies, and into 9 strategies: rehearsal, elaboration, organization, critical thinking, metacognitive self-regulation, time and study environment, effort regulation, peer learning and help seeking, proposing, and validating an instrumental scale of measurement called MSLQ (Motivation and Learning Strategies Questionnaire). Subsequent research has linked the concepts of motivation and learning strategies by analyzing the different indicators that determine academic achievement (Loyens et al., 2008). Through meta-analysis research, Credé and Phillips (2011) determine the main learning strategies detected in these studies, such as self-efficacy, effort management, study management and self-regulation. At present, most research are based on the scale of scores collected according to the MSLQ scale (Pintrich et al., 1991) (see Rashid and Rana, (2019)). Student self-regulation, as a characteristic of quality learning, will be decisive in ensuring high academic performance. Numerous studies confirm that self-regulation is a very relevant factor in current learning theories (Panadero, 2017; Zimmerman, 2015). Furthermore, others affirm that intrinsic motivation is one of the essential elements for improving academic performance at university (Buzdar et al., 2017; Theobald, 2021)). Nevertheless, other research has shown relationships between different teaching–learning strategies and student motivation at the university stage in different educational environments (Cayubit, 2022; Lugosi & Uribe, 2022; Michailidis et al., 2022).

Moreover, to obtain evidence on the relationships between learning strategies and student motivation, at present, there are many instruments and tools available based on scales validated in different contexts and applied to different educational stages. Thus, the EDAOM (Inventory on Learning Styles and Motivational Orientation) is available (Castañeda & Ortega, 2004). As it has been mentioned before, Pintrich et al. (1991) developed and validated a scale called Motivational Strategies for Learning Questionnaire (MSLQ) of 81 items. Subsequently, this questionnaire was reduced and validated to a new 40-item scale (Pintrich et al., 1993), called MSLQ-SF. This scale has been translated and validated internationally, in Spain (Roces et al., 1995), in China (Rao & Sachs, 1999) and in many other countries. In Spain, Zurita Ortega et al. (2019) carried out a validation of the questionnaire MSLQ_SF adapted to university students, obtaining good psychometric indicators, but detecting some variations over the original questionnaire in terms of motivation and learning strategies factors.

Validity and reliability for psychometric instruments

Validity and reliability relate to the interpretation of scores from psychometric instruments in educational research (Cook & Beckman, 2006). Methods for assessing the validity of results from psychometric instruments derive from theories of psychology and educational assessment (Messick, 1989). Validity refers to “the

degree to which evidence and theory support the interpretations of test scores by the proposed uses of tests” (AERA/APA/NCME, 1999; Borsboom et al., 2004). Validity is not a property of the instrument, but of the instrument’s scores and their interpretations and the inference (Cook & Beckman, 2006). Messick, (1989) identifies five sources of evidence to support validity: content, response process, internal structure, relations to other variables, and consequences. Content evidence “involves assessing the relationship between a test’s content and the construct it is intended to measure” (AERA/APA/NCME, 1999). Response Process: “reviewing the actions and thought processes of test takers can help the fit between the construct and the performance” (AERA/APA/NCME, 1999). Internal Structure: reliability and factor analysis are evidence for the internal structure (Floyd & Widaman, 1995; Sellbom & Tellegen, 2019; Shrestha, 2021). Relations to other variables: the aim is to correlate the scores obtained with the instrument with another similar instrument that has already been validated. Consequences: the aim is to assess the intended or unintentional shortcomings of the proposed instrument, as well as the source of their possible invalidation (Abeele et al., 2020).

Reliability is a necessary condition, but not sufficient (Sürücü & Maslakci, 2020). It refers to the consistency of scores from one assessment to another (AERA/APA/NCME, 1999). An instrument that does not yield reliable scores does not permit valid interpretations (Cook & Beckman, 2006). There are different ways to measure reliability. For internal consistency, the Cronbach’s alpha can be applied (Cronbach, 1951). For agreement inter-rater reliability, Phi coefficient, weighted Kappa coefficient or Kendall’s taus, can be computed (Nunnally & Bernstein, 1994). For temporal stability, a test–retest reliability can be worked out (Noble et al., 2021). Scores measuring a single construct would correlate highly. If internal consistency is low, scores are measuring more than one construct (Cook & Beckman, 2006). Examples of how psychometric properties should be instrumentalized and studied for the validation of a scale can be seen in Moguerza et al. (2017), Moret-Tatay et al. (2015) and Zurita Ortega et al. (2019).

Methodology and materials

Materials

Instruments

The questionnaire is an adapted version of MLSQ-SF to consider dimensions as knowledge, planification, study management, time management, emotional management, perseverance, and adversity management. It consisted of 41 questions (Table 1), divided into 2 dimensions and 7 subscales: learning strategies and intrinsic motivation. The first dimension includes aspects of study organization and planning, active self-management of study, effort and understanding of materials. The second dimension includes subscales of emotional management and managing adversity. The complete list of items considered can be found in Table 1. All items were rated on a Likert scale from 1 to 10, where 1 means never and 10 means always.

Table 1 List of items

Code	Items
P1	I try to adjust my study methods to meet the subject requirements in the degree
P2	I make sure to keep up with weekly course readings and assignments
P3	When I do a midterm, I compare myself with my teammates
P4	As I read the materials, I try to relate the material to the ones I already know
P5	When studying the readings for the subjects, I highlight the material to organize my ideas
P6	I try to look for support in evidence when a reading, theory or conclusion is presented in class
P7	When I'm confused about something I'm reading, I read it again and try to clear it up
P8	I generally prefer to go to a place where I can concentrate on my study
P9	I make an effort to do academic work well even though I don't like it
P10	I prefer class materials that pique my curiosity, even if it's hard to learn
P11	I think that the materials of the subjects are useful for acquiring knowledge
P12	When I take an exam, I think about the consequences of making a mistake
P13	When studying for the subject, I summarize the main ideas of the readings and the class
P14	When I study for a subject, I review the readings and my notes, finding the most important ideas
P15	Every time I tackle a topic, I try to think about why I should learn it
P16	I generally perform adequately in the topics of the subjects
P17	I often check the order of the material of the subjects before studying
P18	When I study for classes, I set goals to direct my activities during each period of study
P19	I find it most satisfying to understand all the contents of this degree
P20	I rarely find an hour to review my notes or readings before an exam
P21	I feel very restless when I take an exam
P22	I try to understand the materials in the classes by making connections between what I have learned and the readings
P23	When I study, I review my notes
P24	I relate my ideas to what I'm learning in the subjects
P25	When studying for a subject, I try to determine which concepts I don't understand well
P26	It's hard for me to fit into a study schedule
P27	I make an effort to work on the course materials even though they are boring
P28	It's important for me to understand the content of the subjects
P29	I feel like my heart races when I take an exam"
P30	I try to apply what I have learned in each subject in other class activities such as presentations or debates
P31	Whenever there is a statement or conclusion, I think of alternatives
P32	I question myself to make sure I understood what I've been studying in class
P33	Whether it's at home or at university, I have a fixed place to study
P34	In a class I like, I prefer material that challenges me to learn new things
P35	I am interested in the areas to which the subjects of the degree belong
P36	I develop my own ideas from the subject materials
P37	If the subject materials are difficult to understand, I look for alternatives
P38	I properly manage the study time for the subjects
P39	When the work of the subject is difficult, I only do the easiest
P40	If I take messy notes in class, I make sure to tidy them up later
P41	When I study, I make an outline, diagram, mind map or similar, for the important concepts

Source: Authors

- (a) F1: Active self-management of study material. Items P4, P6, P10, P15, P16, P22, P24, P25, P28, P30, P31, P32, P34, P36 and P37.
- (b) F2: Organization of material. Items P1, P2, P17, P18, P26, P38, P40.
- (c) F3: Study management. Items P5, P13, P14, P23, P41.
- (d) F4: Self-management of effort. Items P7, P8, P9, P27, P33.
- (e) F5: Understanding of study content. Items P11, P19, P35.
- (f) F6: Emotional self-management. Items P21 and P29.
- (g) F7: Adversity management. Items P20 and P39.

Procedure

The data for the study were obtained through simple random sampling, in the different classes, courses and degree courses, guided by the classroom teachers, with a duration of 10 min to fill in an online questionnaire, via a QR code, from their mobile phones. The students were provided with a random code, to maintain anonymity in their answers, and not coinciding with others, through an algorithm of numbers. In the questionnaire, students were provided with informed consent and an information sheet about the study, which explained the characteristics and purpose of the study. For acceptance, they simply ticked the appropriate box. The study was approved by the university's Research Ethics Committee.

Participants

The analysis focuses on a significant sample of 596 students enrolled in different degrees from a variety of subject areas at the Spanish public university Universidad Rey Juan Carlos. The degrees they are studying correspond to the area of Social Sciences (Economics, Business, Marketing, Education, Politics), the Arts and Humanities (History, Language and Literature) and Legal Sciences and International Relations. The courses in which the students are enrolled range from first to fifth year, the majority being first and second year. Some questionnaires were excluded from the analysis because they were incomplete. All descriptive results are displayed at Table 2. Concerning the variable Sex, a 30% of individuals were male and 70% female... In addition, a 44% do have a scholarship to study, and as a result, 56% of families or themselves must finance their university studies.. A 57% of students do not work to finance their studies.. We can also observe the household income distribution. Most of students, 63%, chose the degree course they are taking as their first option, and 22% as their second option. This information is relevant because it is directly related to the intrinsic motivation of the students to continue their studies. Table 3 shows that 31% of students do not have a scholarship and do not work, so the main funders of studies are families; In addition, 26% do have a scholarship and are not working. Only 1.34% of the students surveyed work full-time and have also a scholarship. 17% work part-time and have scholarships. If we focus on the contingency table (Table 4) between having a scholarship and the sex of the student,

Table 2 Descriptive analysis

Variables	Categories	Frequency	Percent
Sex	Male	181	30.369
	Female	413	69.295
	Other	1	0.168
	Missing	1	0.168
Get a college scholarship	No	334	56.040
	Yes	261	43.792
	Missing	1	0.168
Do you work?	Yes, full time	23	3.859
	Yes, part time	234	39.262
	No	338	56.711
	Missing	1	0.168
Household Income	From 0 to 12.450€	63	10.570
	From 12.451 € to 20.200 €	134	22.483
	From 20.201 to 35.200 €	174	29.195
	From 35.201 € to 60.000 €	136	22.819
	From 60.001 € to 300.000 €	40	6.711
	More than 300.000€	2	0.336
	Missing	47	7.886
In what position did you choose your current studies?	First option	370	62.081
	Second option	130	21.812
	Third option	51	8.557
	Fourth or greater option	40	6.711
	Missing	5	0.839

Source: Authors

we observe that 34.51% of women have a scholarship, compared to 9.42% of men. This difference is reduced, between the two sexes, when individuals do not have a scholarship.

Data analysis

Data were analyzed using JASP 0.17.2.1. software for both exploratory factor analysis (EFA) (Moguerza et al., 2017) and confirmatory factor analysis (CFA) (Moguerza et al., 2017). To carry out the EFA analysis, certain preliminary tests were carried out, multivariate normality, linearity and correlation between variables (Tabachnick & Fidell, 1989). An oblimin rotation was performed to determine the factor loadings, accepting those factors with an eigenvalue greater than 1 (Corner, 2009). The number of factors was determined through hypothesis testing and

Table 3 Contingency table work and college scholarship

College Scholarship		Do you work?			Total
		Yes, at full time	Yes, at part time	No	
No	Count	15	135	183	333
	% of total	2.525%	22.727%	30.808%	56.061%
Yes	Count	8	99	154	261
	% of total	1.347%	16.667%	25.926%	43.939%
Total	Count	23	234	337	594
	% of total	3.872%	39.394%	56.734%	100%

Source: Authors

also using Horn's parallel analysis (Horn, 1965; Lloret-Segura et al., 2014). To determine the internal consistency of the scale, Cronbach's Alpha, homogeneity items, KMO index and Barlett's sphericity test (Kaiser, 1974) were used.

After the EFA analysis, a confirmatory factor analysis was carried out to determine the goodness of fit of the data, which is essential to establish the validity of the scale. To confirm the adequacy of the model, different fit indices were used; the chi-square χ^2 statistic (La Du & Tanaka, 1989); the goodness-of-fit index (GFI) whose reference value is 0.90 to consider the model acceptable (Hu & Bentler, 1999); the square root of the mean square residues (RMSR), based on the residuals, where if the value is close to 0, the better the fit, and whose reference value is 0.08 (Jöreskog & Sörbom, 1979); within the incremental fit indices, the comparative fit index (CFI), normed fit index (IFI), all of them between 0 and 1, and whose reference value is 0.9 (Bentler, 1990); and finally, within parsimony adjustment indices, the error of the root mean square approximation (RMSEA) of the RMSR. In this case, the smaller, and closer to 0, the better (Steiger, 2000).

Table 4 Contingency table college scholarship and sex

College Scholarship		Sex			Total
		Male	Female	Other	
No	Count	124	208	1	333
	% of total	20.875%	35.017%	0.168%	56.061%
Yes	Count	56	205	0	261
	% of total	9.428%	34.512%	0.000%	43.939%
Total	Count	180	413	1	594
	% of total	30.303%	69.529%	0.168%	10%

Table 5 Means, standard deviations, skewness and Kurtosis of items

	Mean	Std. Deviation	Skewness	Std. Error of Skewness	Kurtosis	Std. Error of Kurtosis
P1	7.471	1.927	-0.951	0.1	1.316	0.2
P2	5.995	2.271	-0.501	0.1	-0.158	0.2
P3	5.598	2.758	-0.347	0.1	-0.735	0.2
P4	7.502	1.859	-0.768	0.1	0.734	0.2
P5	7.626	2.26	-1.12	0.1	1.245	0.2
P6	6.008	2.275	-0.547	0.1	0.074	0.2
P7	8.686	1.425	-1.103	0.1	1.058	0.2
P8	8.527	2.047	-1.984	0.1	4.493	0.2
P9	8.696	1.472	-1.284	0.1	1.893	0.2
P10	8.012	1.818	-1.023	0.1	1.522	0.2
P11	7.014	1.878	-0.761	0.101	1.418	0.201
P12	8.097	2.078	-1.492	0.1	2.45	0.2
P13	7.704	2.141	-1.105	0.1	1.263	0.2
P14	8.352	1.686	-1.409	0.1	3.196	0.2
P15	6.128	2.488	-0.549	0.1	-0.166	0.2
P16	7.178	1.489	-0.4	0.1	0.271	0.2
P17	7.535	2.125	-1.12	0.1	1.33	0.2
P18	6.582	2.252	-0.695	0.1	0.355	0.2
P19	7.451	2.026	-0.881	0.1	0.851	0.2
P20	4.432	2.97	0.209	0.1	-1.001	0.2
P21	6.449	2.835	-0.6	0.1	-0.523	0.2
P22	7.407	1.914	-0.937	0.1	1.51	0.2
P23	8.921	1.516	-2.288	0.1	7.902	0.2
P24	7.934	1.658	-0.987	0.1	2.039	0.2
P25	7.912	1.627	-1.017	0.1	2.191	0.2
P26	4.881	2.968	0.034	0.1	-1.1	0.2
P27	7.624	1.731	-0.957	0.1	1.872	0.2
P28	8.352	1.62	-1.066	0.1	1.28	0.2
P29	6.63	2.971	-0.733	0.1	-0.45	0.2
P30	7.417	1.995	-0.857	0.1	0.77	0.2
P31	6.615	2.087	-0.479	0.1	0.076	0.201
P32	6.884	2.09	-0.538	0.1	0.035	0.2
P33	8.606	2.007	-2.006	0.1	4.631	0.2
P34	7.417	2.09	-0.858	0.1	0.771	0.2
P35	7.637	1.976	-1.008	0.1	1.021	0.201
P36	7.123	1.894	-0.604	0.1	0.63	0.201
P37	7.653	1.837	-1.093	0.1	1.9	0.2
P38	6.446	2.284	-0.748	0.1	0.38	0.201
P39	4.284	2.826	0.027	0.101	-1.132	0.201
P40	7.813	2.474	-1.261	0.1	1.058	0.2
P41	6.526	3.009	-0.686	0.1	-0.515	0.2

Source: Authors

Table 6 Bartlett's test

Bartlett's Test		
χ^2	df	<i>p</i>
8885.895	820.000	<0.001

Source: Authors

Results

Internal consistency

The Cronbach's Alpha of the proposed scale is $\alpha = .892$ ($\alpha = .938$ in Zurita Ortega et al., 2019), with a total explained variance of 51.26%, in seven factors. As for Cronbach's Alpha, if any item of the scale is eliminated, it takes values between .885 and .91. ANOVA tests with Friedman's test and Hotelling's t-squared indicate that the multivariate means are statistically different (Carey et al., 2022; Göktuna et al., 2022). Table 5 presents a descriptive analysis of the scales, together with their skewness and kurtosis, where the values are within the appropriate ranges. It shows the descriptive statistics of the values measured according to the derived scores for each of the questions in the questionnaire. We can observe the average values collected, the standard deviation, as well as the measures of skewness and kurtosis, to verify the normality of the values of the distribution. In terms of skewness, we can point out that most of the questions have some symmetry to the left; regarding kurtosis, we observed that the distribution is leptokurtic in most of the items. These results indicate a certain concentration of the values measured around the mean values of the variables.

Exploratory and conformitory factor analysis

In relation to the validation of the Exploratory Factor Analysis (EFA), the Bartlett's test of sphericity was $p < .001$, with a Chi-squared value of 8888.89, and a Kaiser–Meyer–Olkin index (KMO) of .92. According to Table 6, the pvalue for Bartlett's test is smaller than 0.05 significance level. That fact shows us factor analysis is appropriate for reducing dimensions and obtaining constructs. The Chi-squared Test shows us a similar result. A KMO index greater than 0.8 indicates that EFA is suitable for the analysis. Once the suitability of applying principal component analysis through Bartlett and Chi-squared contrasts has been verified, a factor analysis is performed. To improve the orthogonality of the estimated factors, an

Table 7 Chi-squared test

	Chi-squared Test		
	Value	df	<i>p</i>
Model	1015.186	554	<0.001

Source: Authors

Table 8 Rotate factor loading of dimensions

	F1	F2	F3	F4	F5	F6	F7
P1	0.13	0.582	0.274	0.122	0.198	0.109	-0.115
P2	0.208	0.694	0.214	-0.063	0.11	0.147	-0.046
P3	-0.022	0.005	-0.022	0.172	-0.001	0.102	0.339
P4	0.528	0.089	0.305	-0.081	0.055	-0.026	-0.226
P5	0.138	0.347	0.479	0.115	0.082	0.084	-0.136
P6	0.528	0.323	0.137	-0.071	-0.052	0.069	0.046
P7	0.311	-0.067	0.212	0.549	0.076	-0.081	-0.217
P8	0.025	0.229	0.083	0.404	0.286	-0.006	-0.106
P9	0.189	0.261	0.16	0.526	0.027	0.117	-0.305
P10	0.452	-0.097	0.142	0.248	0.186	-0.127	-0.171
P11	0.261	0.145	0.051	0.079	0.628	-0.004	-0.082
P12	0.115	-0.021	0.035	0.564	0.178	0.294	0.177
P13	0.223	0.145	0.738	0.061	-0.032	0.032	0.026
P14	0.147	0.197	0.657	0.328	0.127	0.002	-0.1
P15	0.499	0.141	0.128	0.016	0.03	0.058	0.216
P16	0.474	0.275	0.099	0.104	0.134	-0.291	-0.056
P17	0.204	0.432	0.093	0.313	0.079	-0.03	-0.016
P18	0.365	0.574	0.051	0.121	0.16	0.104	0.086
P19	0.219	0.17	0.122	0.062	0.741	0.127	0.085
P20	0.106	-0.214	-0.069	-0.004	-0.263	0.19	0.477
P21	0.001	0.036	0.058	0.066	0.022	0.907	0.083
P22	0.556	0.095	0.417	0.079	0.168	0.106	-0.096
P23	0.137	0.18	0.542	0.33	0.155	0.012	-0.09
P24	0.594	0.08	0.27	0.226	0.198	-0.006	-0.088
P25	0.486	0.122	0.309	0.408	0.119	0.028	-0.094
P26	0.107	-0.609	-0.026	-0.138	-0.186	0.156	0.2
P27	0.276	0.339	0.293	0.38	0.135	0.266	-0.194
P28	0.422	0.1	0.278	0.296	0.406	0.083	-0.151
P29	0.014	0.078	0.046	0.067	0.018	0.897	0.057
P30	0.602	0.068	0.223	0.091	0.325	0.034	-0.104
P31	0.698	0.05	0.016	-0.044	0.066	-0.069	0.16
P32	0.696	0.08	0.078	0.149	0.15	0.138	0.107
P33	0.001	0.245	0.048	0.557	-0.018	-0.021	0.034
P34	0.59	0.072	0.027	0.086	0.097	-0.023	-0.185
P35	0.237	0.245	0.06	0.084	0.647	-0.071	-0.001
P36	0.607	0.256	0.033	0.157	0.241	-0.015	0.057
P37	0.485	0.225	0.199	0.33	-0.028	0.094	0.077
P38	0.223	0.705	0.202	0.093	0.167	-0.056	0.061
P39	-0.017	-0.018	0.029	-0.114	0.079	0.031	0.741
P40	0.084	0.532	0.308	0.335	0.003	0.126	0.003
P41	0.171	0.185	0.586	-0.071	0.107	0.013	0.262

Source: Authors

Table 9 Fit indices EFA

Fit indices EFA				
RMSEA	RMSEA 90% confidence	SRMR	TLI	CFI
0.037	0.034—0.041	0.026	0.915	0.943

Source: Authors

oblimin rotation is performed (Luo et al., 2019). To consider the number of factors, all those whose associated eigenvalue is greater than 1 are considered (Moguerza et al., 2017). In addition, a parallel analysis is performed to determine the number of significant factors (Horn, 1965) (Table 7).

The EFA has confirmed the existence of 7 main factors, whose factor loadings are shown in Table 8, according to criteria set. The variables have been associated with each of the dimensions, factors, according to the criterion of having the highest factor load in a significant way, and not distributed among the rest of the dimensions. In those cases where the factor load could not be assigned a certain dimension, because it was shared between several factors, the item for the validation of the scale was not considered.

In a CFA incremental fit indices are those indices that evaluate the improvement of the proposed model in relation to a base model (McNeish et al., 2018; Jordan-Muñoz, 2021). CFI (Comparative fit index, the GFI (Goodness of fit index) and TLI (Tucker-Lewis index) are examples of these fit indices. If CFI gives a value greater or equal to .95, the model is said to fit the sample (Lai, 2021). For GFI, a cut-off point greater than .89 is recommended in a sample of 100 cases, while in larger samples, a cut-off greater than .93 is recommended (Cho et al., 2020). Xia and Yang (2019) recommend a cut-off point for TLI greater than .90. When the RMSEA (Root Mean Squared Error of Approximation) gives a value less than or equal to .06, the model is an adequate fit for the sample (Lai, 2021). For SRMR (Standardized Root Mean square Residual), a cut-off point less than .09 is recommended in a sample of 100 cases or less, while for a sample greater than 100 cases, a cut-off point of .08 or less is recommended (Cho et al., 2020). Another indicator we can consider evaluating the fit of the sample to the proposed model is the chi-square (χ^2); if its value is statistically significant (e.g., $p < .05$), the fit of the model is poor compared to the sample. Rigdon (1996) has shown “CFI is problematic because of its baseline model because CFI seems to be appropriate in more exploratory contexts, whereas RMSEA is appropriate in more confirmatory contexts”. On the other hand, CFI does have an established parsimony adjustment, although the adjustment included in RMSEA may be inadequate. Otherwise,

Table 10 Fit indices CFA

Fit indices EFA					
RMSEA	RMSEA 90% confidence	GFI	SRMR	TLI	CFI
0.056	0.053 – 0.059	0.978	0.056	0.929	0.844

Source: Authors

Table 11 Chi-square test

Model	χ^2	df	<i>p</i>
Baseline model	8367.371	703	
Factor model	1842.839	644	<0.001

The estimator is ML. Source: Authors

Table 12 Parameter Estimates. Factor loadings

Factor	Indicator	Estimate	Std. Error	z-value	<i>p</i>	Std. Est. (all)
F1	P4	1.053	0.073	14.39	<0.001	0.567
	P6	1.214	0.090	13.423	<0.001	0.534
	P10	0.894	0.073	12.170	<0.001	0.492
	P15	1.126	0.101	11.119	<0.001	0.453
	P16	0.820	0.059	13.899	<0.001	0.551
	P22	1.352	0.071	19.133	<0.001	0.708
	P25	1.044	0.062	16.832	<0.001	0.643
	P28	1.033	0.062	16.643	<0.001	0.638
	P30	1.378	0.074	18.522	<0.001	0.691
	P31	1.138	0.083	13.706	<0.001	0.546
	P32	1.400	0.079	17.770	<0.001	0.671
	P34	1.112	0.083	13.393	<0.001	0.533
	P36	1.201	0.073	16.459	<0.001	0.634
	P37	1.020	0.073	14.050	<0.001	0.556
F2	P1	1.341	0.074	18.128	<0.001	0.697
	P2	1.542	0.088	17.484	<0.001	0.679
	P17	1.100	0.087	12.591	<0.001	0.518
	P18	1.395	0.090	15.498	<0.001	0.619
	P26	-1.300	0.126	-10.333	<0.001	-0.438
	P38	1.532	0.089	17.246	<0.001	0.672
	P40	1.490	0.100	14.928	<0.001	0.602
F3	P5	1.279	0.093	13.816	<0.001	0.566
	P13	1.398	0.086	16.324	<0.001	0.654
	P14	1.289	0.064	20.036	<0.001	0.766
	P23	0.933	0.061	15.327	<0.001	0.616
	P41	1.259	0.129	9.727	<0.001	0.419
F4	P7	0.742	0.062	12.041	<0.001	0.521
	P8	0.942	0.088	10.716	<0.001	0.460
	P9	0.937	0.061	15.340	<0.001	0.636
	P27	1.195	0.069	17.422	<0.001	0.691
	P33	0.718	0.088	8.138	<0.001	0.358
F5	P11	1.074	0.081	13.200	<0.001	0.573
	P19	1.409	0.087	16.204	<0.001	0.695
	P35	1.265	0.085	14.824	<0.001	0.639
F6	P21	2.713	0.156	17.381	<0.001	0.957
	P29	2.497	0.155	16.136	<0.001	0.841
F7	P20	1.555	0.251	6.205	<0.001	0.524
	P39	1.144	0.198	5.764	<0.001	0.405

Source: Authors

Table 13 Reliability coefficients

Reliability	Coefficient ω	Coefficient α
F1	0.870	0.877
F2	0.681	0.558
F3	0.700	0.700
F4	0.639	0.652
F5	0.678	0.665
F6	0.892	0.892
F7	0.357	0.350
Total	0.874	0.888

Source: Authors

($p \geq .05$), the model is considered to fit the sample adequately (Walker & Smith, 2017). However, given that the chi-square fit statistic is affected by large samples, the ratio of the chi-square statistic to the respective degrees of freedom (χ^2/df) is preferred (Wheaton et al., 1977). The chi-square statistic, with large sample sizes, it will most probably remain statistically significant.

As it can be seen in Table 9, the goodness-of-fit measures for the exploratory factor analysis would be within the desirable values, as can be seen in the literature, and would provide indicators that the adjusted model has a good fit to the sample values. In Tables 10 and 11, we can see different values of the incremental adjustment indices for the confirmatory factor analysis model. In this case, regarding the Confirmatory Factor Analysis (CFA), the following results were obtained (Tables 10 and 11), all goodness-of-fit measures are within the ranges recommended by other studies, except for the values of the CFI and for χ^2 , which would be slightly lower than those recommended in the literature. In any case, according to Ridgon (1996), in confirmatory factor analysis contexts, the RMSEA is a more appropriate goodness-of-fit measure. In addition, the χ^2 index has certain limitations when the samples are very large, tending to reject the null hypothesis of a good fit between the factorial model and that provided by the sample values (Wheaton et al., 1977). If we focus on the estimates of the parameters associated with each of the items that are part of the identified dimension, we can see that, in each of them, the effects of the variables are positive and statistically significant, except in the case of question P26 "It's hard for me to fit into a study schedule". This indicates that, when the results of the survey need to be scaled, this question is reversed, and should be recoded appropriately (Table 12). In most cases, the estimated parameter takes a value of 1 or higher, indicating that the individual effect of that question on the associated dimension, on average, provides a greater value on the construct (Table 13).

If we now focus our attention on the reliability of each of the constructs, using the ω and Cronbach's alpha coefficients, we can observe that most of them obtain acceptable values, according to the literature, except in the case of the F7 factor, where the coefficient to measure reliability would indicate that additional variables would be needed to improve the information provided by the construct. (Table 14).

Table 14 Correlation matrix

	F1	F2	F3	F4	F5	F6	F7
F1	1						
F2	-.131**	1					
F3	0.061	-0.077	1				
F4	.114**	-.201**	-0.008	1			
F5	-.297**	.286**	0.082	-.248**	1		
F6	.226**	-0.069	0.080	0.074	-.178**	1	
F7	-.350**	.322**	-0.028	-.234**	.336**	-.177**	1

Source: Authors

** $p < 0.01$

However, the total reliability of the proposed instrument would obtain very adequate values, according to those provided in the literature.

Concerning information provided by Table 14, where the correlations between the different dimensions are displayed, we can see that they take values close to 0, and would indicate that there is little, although significant in some cases, or no relationship between the constructs. This property is desirable to ensure that there is orthogonality between constructs, and in this way, to guarantee that the variables associated with each of them do not provide information that can be associated with more than one of them.

Validity

In order to test the internal validity of the proposed scale, actions have been planned to carry it out at the content, criterion and construct levels. For content validity, the scale proposal was submitted to the judgement of several experts, teachers and pedagogues, in which some modifications and adaptations of the initial questions were made according to their expressed criteria. Regarding criterion validity, no similar scale has been used for data collection, although the properties obtained can be checked by the goodness of fit of the model. Pintrich et al. (1993) obtained model goodness-of-fit measures, in the standardized solution, of GFI=.77, AGFI=.73, $\chi^2/df=3.49$ and RMR=.07 for the motivation scale, and model goodness-of-fit measures, in the standardized solution, of GFI=.78, AGFI=.75, $\chi^2/df=2.26$ and RMR=.08 for the cognitive learning strategies scale. Zurita Ortega et al. (2019) do not conclude their work by performing a confirmatory factor analysis, so no goodness-of-fit indicators of the estimated model are available. For construct validity, as mentioned in the previous section, exploratory and confirmatory factor analyses were carried out. The results have not been confronted with other available instruments, since they have been considered to propose different indicator proposals than those established, the orientation of the questions has been modified to adapt them to the needs of the study, and they have been defined in an alternative way to collect complementary information on other aspects. This confrontation, once the instrument has been validated, will be proposed as a future line of research.

Discussion and conclusions

Discussion

Numerous studies have verified the importance of students' intrinsic motivation, together with their learning strategies as indicators of achievement to get success, both in the completion of studies and entrepreneurial capacity (Inzunza et al., 2018; Zurita Ortega et al., 2019). A version of the extended questionnaire by (Pintrich, 1991) with a gender perspective, in Spain, has been validated by (Ramírez et al., 2022). To establish relationships between students' intrinsic motivation and different learning strategies, a scale based on 41 questions was developed based on the validated MSLQ-SF questionnaire developed by Pintrich et al. (1993), translated into several languages, and validated in different countries. The present research work aims to verify the psychometric properties of this proposal to study the motivational factors of university students from different university fields with the aim of staying in the degree and finishing successfully, and that it can be used as a leading indicator for the personal skills required for entrepreneurship, considering common and relevant aspects, such as the management of emotions and the management of adversity. The results obtained in this research are satisfactory in terms of internal consistency, with a Cronbach's Alpha of .892. In addition, better fit indicators are obtained than those provided by Pintrich et al. (1993) (see "Validity" section) according to the standards of goodness of models today. Through exploratory and confirmatory factor analysis, 7 final factors have been obtained (an eighth factor corresponding to a question of the questionnaire, P3, was eliminated) and two main dimensions; learning management strategies and intrinsic motivation associated with emotional self-management and adversity management. The main measures of the model seem to indicate that the model is valid and reliable for estimating motivation and learning strategies as part of a theoretical model based on structural equations. The implications derived from the intrinsic relationship of learning strategies and intrinsic motivation can be found in several previous studies (Inzunza et al., 2018) among others.

In the EFA analysis, items with factor loadings above 0.1 were considered, and the choice of the number of factors was determined by a parallel analysis (Horn, 1965). The KMO and Barlett's sphericity test instruments have demonstrated the adequacy of the analysis. In the CFA analysis, all the parameters associated with the items of the EFA model questions were found to be statistically significant for each of the factors they predict ($p < .001$). As for the relationship between the estimated latent factors, a positive relationship has been observed between the estimated parameters associated with each of them, except with Factor 7 (Adversity management) whose relationship is negative; and the estimated relationship between Factor 6 (Emotional self-management) with Factor 7, both intrinsic motivation factors. The overall results indicate that appropriate learning strategies have positive effects on each other, and lead to an improvement in emotional self-management and a reduction in adverse situations. These results, although similar to other studies mentioned above,

are structured differently from them, emphasizing organizational motives of time and resources, understanding of materials and self-management of effort. The findings of this research are relevant because it focuses on student engagement for success, highlighting good organization of materials and time (Peck et al., 2018), efficient effort management (Anthonysamy et al., 2020; Schunk & DiBenedetto 2020) and understanding of materials (Esra & Sevilen, 2021) through other learning mechanisms, such as tutorials, as other authors have stated (Effeney et al., 2013).

Theoretical contribution

The adapted version of the questionnaire proposed by (Pintrich et al., 1993), in its short version, MLSQ-SF, and which forms the central part of this research, has obtained good psychometric results, obtaining a shorter modality, with different constructs from the original, since the questions were directed towards a global learning strategy to achieve success in the completion of the studies. and aspects more related to intrinsic motivation derived from emotional management and adversity management were included. These skills have been identified in the literature as relevant, as influencing students' intrinsic motivation and as an indicator of intentionality towards entrepreneurship. This adapted version is structured in two blocks, learning strategies towards achievement, from which five factors are derived, and management of intrinsic motivation, related to emotions and the management of adversity. The identified constructs are partially in agreement with those determined by Cardozo (2008), Martínez and Galán (2000) and Rocés et al. (1995), but they incorporate aspects of emotional management as determining variables in intrinsic motivation. In this research, special emphasis has not been placed on academic performance, but on the need for achievement for the success of the being graduated, together with the value as an anticipatory sign of personal competence towards entrepreneurship. Therefore, the validation of this instrument provides a useful tool to determine what actions can be derived, by the different educational agents involved, to promote motivation towards achievement and capacity for entrepreneurial intention.

Other implications

The main implications of the result of this research can be seen reflected in the frequent use that educators, policymakers, and society in general can make to determine the strategies that must be articulated to achieve adequate motivation and stimulation of university students. With regard to teachers, the instrument will make it possible to obtain information on the shortcomings of students and modulate correction mechanisms to help them achieve their goals and achievements. These actions, carried out in advance and adapted to the personal circumstances of the students, will help to obtain better results of satisfaction and encouragement to achieve their own objectives. As for the implications that may be relevant for

policymakers, it is a matter of developing actions at a global level, through extra-curricular training, that promotes and trains socio-emotional skills together with cognitive competencies, to achieve academic success. Policies of training, awareness, guidance and psychological support, once the individual needs of students have been determined, will result in an improvement in their professional skills, assertiveness, improved management of emotions, preparation for risk and uncertainty, and will increase their capacity for creativity and entrepreneurial competence. Finally, with respect to society, considering that education is subsidized by the state, through public resources from the collection of taxes, any dropout rate can be considered as an embezzlement of public funds. This instrument can be used by public administrations to analyse the deficiencies of the system, determine which aspects may represent an opportunity for improvement, with the ultimate objective of using public resources efficiently and effectively.

Limitation and future research

This research has certain limitations. Some of the questions adapted from the instrument, despite having been validated by a set of experts, have not been adequately understood by the students, having been confused with another intentionality. The sample has been chosen through certain areas of knowledge, mainly in Social Sciences, Humanities and Law, not having obtained data on experimental and engineering degrees where the structure could be different. One of the factors obtained has limited internal consistency, which suggests that, to provide broad validity, the inclusion of more questions related or more explicitly related to the management of adversity should be considered.

As for future lines of research, the intention is to extend the analysis to other areas of knowledge, to extend the questions related to those dimensions whose consistency was not high, to include other types of questions with a language that can be more understandable for students, to eliminate or reword those questions that have not been relevant in the validation of the scale. It is planned to develop a questionnaire, in which variables related to the intrinsic motivation of individuals and aligned with personal capacities towards entrepreneurship are incorporated, to determine the anticipated correlation of one instrument against the other.

Conclusions

This paper attempts to validate the psychometric properties of a scale based on the MSLQ-SF, with its adaptation to Spain by Rocés et al. (1995), which has been implemented in a sample of the Spanish university population of the Universidad Rey Juan Carlos, in different fields of knowledge. This scale tries to determine relevant factors for an adequate intrinsic motivation of students to graduate, based on appropriate learning strategies, that can be used as an indicator that approximates their intention about entrepreneurial skill. The validity of the instrument has been verified through different goodness-of-fit measures, obtaining good properties.

The dimensions obtained and the estimated relationships between them offer us a framework from which universities can complement formal academic training with tools for time management, effort, understanding of materials, emotional self-management, and management of adversity in terms of anxiety, providing tools for improving motivation as a link with personal entrepreneurship. The results in the validation of the scale have partially differed from those obtained by similar studies, therefore, its scope of application must be subject to the conditions and circumstances of the environment in which the data have been collected. This fact, even if it remains somewhat general, will have to be contrasted with more research that addresses it, in order to extrapolate the results to a general level. This scale is expected to be complemented by the development of a new instrument that collects information on the relationship between motivation and personal entrepreneurial competence, with which several elements are shared, and with which it is possible to extrapolate the causal relationships between socio-emotional skills of intrinsic motivation and entrepreneurial intention in a more general field.

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