XXIII Congreso Internacional de Contaduría, Administración e Informática

Perception of entrepreneurial programs: development of a measurement instrument

Área de investigación: Educación en contaduría, administración e informática

Elda Barrón Peréz
EGADE Business School
Tecnológico de Monterrey
México
elda.barron@gmail.com

Linda Elizabeth Ruiz Castro
EGADE Business School
Tecnológico de Monterrey
México
linda_elizabeth@hotmail.com

Eric Robles
EGADE Business School
Tecnológico de Monterrey
México
eric@live.com.mx

PERCEPTION OF ENTREPRENEURIAL PROGRAMS: DEVELOPMENT OF A MEASUREMENT INSTRUMENT

Abstract

Entrepreneurship education is one of the approaches that universities employ to try to produce more entrepreneurs. Currently, entrepreneurship education programs do not have the means for capturing the perceived progress by and of their students. In this study, we develop an instrument that measures the aforementioned students' perception. We perform an exploratory and confirmatory factor analysis based on the responses of 173 college students to identify the main factors that students develop in an entrepreneurship education program. Results show that our measurement scale is constituted by the following dimensions: learning, resources, instructor role and a new dimension named meaning of life. This study contributes to our understanding of the value that entrepreneurship education program offered to their participants, providing insights for future adjustments to these the programs.

Key words: Entrepreneurial education, entrepreneurial program, university program.

Introduction

Harvard introduced in 1947: "Management of New Enterprises" the first entrepreneurial course offered in one University (Katz, 2003). Seventy years later is common to find that Universities offer different entrepreneurial courses to their students, since high school to doctoral programs. The primary objective of universities is to teach students how to develop a business idea, create new ventures by forming new services or products that will generate economic growth or social impact. These institutions also build infrastructures and provide resources to students and faculty to construct an excellent educational environment.

For these schools to measure the programs` success is essential. These programs changes according to the perceptions of each generation of students and to the dynamism of the environment as priorities. Different scholars suggest that the way to measure an entrepreneurial program is through entrepreneurial intention that student has derived

from a course (Liñan and Chen, 2009). Other academics refer to the impact that universities have on students in this subject, especially in motivations and skills (Oosterbeek, Van Praag and Ijsselstein, 2010).

The effects that universities programs have on students can vary. Some authors suggest a positive effect of them over entrepreneurial intention and activity (Charney and Libecap, 2000; Honig, 2004). Others scholars show in their research studies insignificant or adverse effect (Oosterbeek, Van Praag, and Ijsselstein, 2010). Also, for some authors, there is a gap between the needs for entrepreneurial education and for the outcomes that currently have observed regarding skills, knowledge, and attitudes (Matlay, 2008). This gap may be due programs do not adjust as quickly as changes in the business environment occur.

Given the potential impact that programs have on entrepreneurial activity and the lack of measures, we aim to develop an instrument that takes into account important attributes that help principals to adjust the programs they offer according to the student perceptions. Our purpose is to develop an instrument in Spanish that contributes to assessing the perception of attributes that students have at the moment they are taking the entrepreneurial course which can help principals to understand better the value of the subjects offered. The intention to develop the instrument in Spanish is due to the importance of applying it in Spanish speaking environments, where the inclusion of entrepreneurial programs has grown during the last years. We obtained an instrument that includes dimensions from previous research such as learning, resources, instructor role as well as a new dimension named meaning of life as factors that measure the perception of entrepreneurial programs.

We proceed as follows. First, we review the literature on entrepreneurial education and entrepreneurial instruments. Then we present the methodology developed to achieve our goal. In the third section, we describe the study results for measuring the perception of entrepreneurial programs. Finally, we present a conclusion, discussion, and research limitations.

Theoretical Context

Entrepreneurship Education

Entrepreneurship represents a significant activity for the economy and social development. Understanding the phenomena is important for several reasons; one of the most important for the academia is how to detonate the entrepreneurial intention to start a business. Studies of entrepreneurial intentions comprise entrepreneurs' traits (De Pillis and Reardon, 2007; Leutner, Ahmetoglu, Akhtar, and Chamorro-Premuzic, 2014), situation or contextual environment (Manolova, Eunni and Gyoshev, 2008; Gupta, Guo, Canever, and Yim, 2014) or entrepreneur background (Phan, Wong, and Wang, 2002; Zellweger, Sieger and Halter, 2011), just to mention some. In recent decades the implementation of business programs is focused on the development of business plans (Honig, 2004) with the aim of creating new ventures. According to these approaches, universities have given rise to a new perspective in this discipline: the entrepreneurial education.

From a general perspective, studies about entrepreneurial education have focused on linking this education with the attitudes, intentions or entrepreneurial actions that individuals may have after taking a course. The existing literature centered on entrepreneurial programs is consistent with the study of the effect of the program on entrepreneurial intention. The entrepreneurial program is defined by Rideout and Gray (2013), as a curricular subject that includes activities that teach entrepreneurial management, strategy, innovation, and venture development in a university setting.

Some academics find a positive relation between entrepreneurial education and individual self-reported to start a business (Honig, 2004;). On the other hand, for some other scholars the effect of entrepreneurial education over entrepreneurial intention or development of entrepreneurial skills is not that significant (Oosterbeek, Van Praag, and Ijsselstein, 2010; Chen, Hsiao, Chang, Chou, Chen, and Shen, 2015). The authors suggest that adverse effect could be caused by context or the research approach based on experiments.

To obtain a consensus on results, it is important to heed to what existing instruments measure. Studies of entrepreneurial programs are mainly

based on exploratory approach and experiments. Some research studies use the type of course taken or the assistance to a particular program as indicators of entrepreneurial behaviors. (Wilson, Kickul, and Marlino, 2007; Oosterbeek et al., 2010; Chen et al., 2015; Hallam, de la Vina, Leffel and Agrawal, 2014; Maritz, Koch and Schmidt, 2016). Table 1 shows entrepreneurial program studies and their approaches to illustrate the developmental stage in this topic.

Authors	Purpose	Method	Entrepreneurial program measures	Findings
Hayter, 2016	Investigate the role of knowledge intermediaries and their impact on the development of university spin-offs.	Case study	Mediators of entrepreneurial education as faculty research, student, advisors.	The importance of intermediaries to support academic entrepreneurship.
Maritz et al., 2016	Explore the integration and results of entrepreneurship education programs within national systems of entrepreneurship and entrepreneurship ecosystems.	Case study	Program's characteristics through students and college attributes.	Authors proposed a conceptual framework of the entrepreneurial programs and ecosystems.
Chen, et al., 2015	Understand whether an entrepreneurship course can improve the entrepreneurial intentions.	Experiments	Learning satisfaction Learning efficacy	Entrepreneurial education cannot improve entrepreneurial intentions.
Oosterbeek et al., 2010	Analyze the impact of an entrepreneurship education program for students.	Survey	Take a program/ Type of program.	The program does not have significant effects.
Souitaris et al., 2007	Test the effect of entrepreneurship programs on the entrepreneurial attitudes and intentions of science and engineering students.	Survey	Development of a scale with the following dimensions: Learning, inspiration and incubation resources	Programs raise some attitudes and the overall entrepreneurial intention.
Hallam et al., 2014	Discuss the implication of a pedagogical construct, Accelerating Collegiate Entrepreneurship (ACE)	Case study	No included	The structure of this program will help entrepreneurial activity and intentions.

Table1. Entrepreneurial programs research

Research on entrepreneurial programs shows an evident purpose, which creates business ideas through the development of more entrepreneurs. The questions that emerge on this theme refer to how entrepreneurial programs do this task? And how entrepreneurial programs could be measured? One important issue about the measurement of entrepreneurial programs is related to each educational institution that offers an entrepreneurial program. Universities need to measure the implementation of their programs to adjust them according to the needs of each generation of students and the dynamic environment immersed. Other scholars suggest that the way to measure an entrepreneurial program is through measuring the success of the entrepreneurial intention that each student has (Liñan and Chen, 2009). Others refer to the impact that universities have on students in this subject, especially in motivations and skills (Oosterbeek et al., 2010).

Despite the number of research about entrepreneurial education and programs, the topic is considered not empirically tested, and a lack of rigorous method is evident. Scholars are called to more quantitative research that combines some variables such as cognitive skills, knowledge and contextual variables, and tests them with statistical tools like SEM. (Souitaris et al.,2007).

Entrepreneurial Programs Attributes

According to the literature review of entrepreneurial courses and education instruments, we identify three principal characteristics related to measures of entrepreneurial courses and entrepreneurial education in general. First, learning is an important attribute commonly used in education research. This concept refers to the level of knowledge acquired. In entrepreneurial education, learning includes the knowledge about entrepreneurship that students acquired during a particular program and it is related to important attributes for entrepreneurial education as satisfaction and efficacy (Okudan and Rzasa, 2006). The inclusion of prior knowledge as a variable in the entrepreneurial field is not the novelty; previous information about a particular matter may influence individual entrepreneurial choices.

Second; we included resources as an attribute for this scale since our interviewers constantly mentioned the importance of having them to facilitate the development of an entrepreneurial idea. These recourses

comprise measures related to internal aspects as meeting partners, technology availability and having different advisors and external elements as participations to events, having access and information on financial sources and infrastructure. According to Souitaris et al., (2007) these type of elements can help to measure the pool of benefits that students obtain from the program and raise entrepreneurial intention.

Third, the Instructor role was also included. According to Fiet, (2001) professors on entrepreneurial programs have a challenging role, because students may perceive entrepreneurial courses as boring. Therefore, professors need to focus on the teaching process with innovative learning activities and interaction with students. Professors may also be a role model for students, the attitudes and behaviors toward the entrepreneurial field may represent a driver to raise entrepreneurial attitudes and intentions on the students (Sobel and King, 2008)

Besides the described elements there is one theme that has emerged in this study, it is known as the meaning of life. This refers to the direction of life an individual desire to pursue (Ryff and Singer, 1998). Some scholars (e.g., Chamberlain & Zika, 1988 and Bonebright, Clay, and Ankenmann, 2000), mostly in the psychological environment, refer that person may feel full in life when their work activities are associated with their life goals. Entrepreneurial programs have been typically focused on creating business and all the elements that surround this activity. They usually consider the personal goals of the students.

In sum, in the existing literature, the way to measure the success of an entrepreneurial program is based on the intentions that the participants have on the creation of a new venture. Progress on this subject has lacked in capturing the perceptions that students have on the program. Therefore, significant and fundamental changes in the content of programs or process of learning could be adjusted with a delay according to the needs of the students.

Methods

Stage one: Scale construction

a) Literature Review

The first step in developing the scale was to perform an extensive literature review of the subject. We identified the dimensions that existing scales have on measuring educational and entrepreneurial programs at universities. For example, for evaluating entrepreneurial courses, usually the intention that a student has to create a new venture is estimated. For regular courses, the emphasis is on the teaching method or teacher´s skills. We combined both perspectives: learning and education methods for regular programs and entrepreneurial education to develop our scale. In this way, we obtain four dimensions related to proper training methods: learning, learning efficacy learning satisfaction and instructor, and one aspect related to entrepreneurial education: resources.

b) Qualitative research

Derived from the literature review, some questions were extracted and later used for five in-depth interviews with teachers and students. Interviewers were currently taking or teaching the course at universities. The goal of these interviews was to confirm the dimensions extracted from the literature and explore new ones to avoid critical themes. We included questions based on literature review, such as what is the methodology used in the program? Could you mention some resources and their importance to the program? What are the expectations of the program? Is this a mandatory program? The questions were adapted for both teachers and students to cover the same items from the two points of view.

After this qualitative study and analysis, we added one dimension that contents four items: meaning in life and strengthened previous ones: learning, learning efficacy, learning satisfaction, resources, and skills from the instructor.

c) Initial scale

We obtained an initial questionnaire with seven dimensions and seventy-three statements. Items were measured using a seven-point Likert scale (1: strongly disagree to 7= strongly agree). We shared our initial questionnaire to an expert panel composed of two teachers and an entrepreneurship expert to obtain feedback about content, redaction,

and understanding. This review confirmed and validated our definition of entrepreneurial program attributes. We used back translation method to translate our questionnaire from English to the Spanish version. Also, we implement a pretest with 20 students of entrepreneurship programs with the similar goal. After this revision and the preliminary test, we modified or removed some items and added one item to resources dimension. We finally obtained a questionnaire with the same seven dimensions but thirty-nine statements. Table 2 shows each dimension and their essential items and sources, original items are translated into English for this article.

Table 2. Measures of entrepreneurial programs included in this instrument

Measure	Dimension	Item code	Sources
Increase your understanding of the attitudes, values, and motivation of entrepreneurs	Learning	Learn 1	Based on Marsh, 1982 and Souitaris et al., 2007
Increase your understanding of the actions someone has to take to start a business		Learn 2	
Enhance your practice management skills to start a business		Learn 3	
Enhance your ability to develop networks		Learn 4	
Enhance your ability to identify an opportunity		Learn 5	
This course teaches me how to be an entrepreneur	Learning Efficacy	Learnef 1	
This course improves my entrepreneurial competencies.		Learnef 2	
I feel satisfied with the learning of this course.		Learnef 3	Based on Okudan and Rzasa (2006) and Chen, et al., 2015
After this course, I may become an entrepreneur.		Learnef 4	
After this course, I can make independent decisions.		Learnef 5	
After this course, I am more willing to take risks		Learnef 6	
After this course, I can tackle entrepreneurship challenges.		Learnef 7	
Instructor's style of presentation held your interest during class		Instructor 1	
Instructor's explanations were clear.	Instructor	Instructor 2	
The instructor made students feel welcome in seeking help/advice in or outside of class.		Instructor 3	Based on Marsh, (1982)
Does teacher show a genuine interest in individual students		Instructor 4	
The instructor presented the background or origin of ideas/concepts developed in class.		Instructor 5	
A pool of entrepreneurial-minded classmates for building a team		Resources 1	
A pool of university technology		Resources 2	
Advice from faculty		Resources 3	
Advice from classmates	Resources	Resources 4	
Advice from tech-transfer officers		Resources 5	
Research resources (library /web)		Resources 6	
Networking events		Resources 7	

Physical space for meetings		Resources 8	
Business plan competitions (testing ground for the idea)		Resources 9	
Seed funding from university		Resources 10	
Referrals to investors		Resources 11	
Financing alternatives		Resources 12	
This course allowed me to align my professional aspirations with personal ones.	Meaning of Life	Life 1	Proposed
This course allowed me to discover my real passion.		Life 2	
I am clear at the end of the course, how I want to invest most of my time.		Life 3	
This course allowed me to discover my qualities and where I can apply them		Life 4	

Stage two: Sample and data collection

We e-mailed online surveys and applied paper-based surveys to students at three Mexican universities, who were currently taking an entrepreneurship program. Students took the reviewed survey to measure student´s impressions of entrepreneurship programs and their characteristics. Also, they responded to demographic questions. We obtain an initial sample of 179. We removed incomplete entries from online surveys and unreadable from a paper-based survey. We finally received a total of 173 surveys from three universities. We used χ^2-tests of independence to analyze significant differences between respondent groups for college and between online and paper-based survey. We also followed the rule of thumb of Tinsley and Tinsley (1987), they suggest a ratio of 1:5 to 1:10 subject per item.

Stage three: Scale assessment

First, we used exploratory factor analysis with principal component analysis using varimax rotation to obtain the measures for each dimension and complete questionnaire. Second, we realize a confirmatory analysis. We used Cronbach´s alpha to assess the internal consistency. Then, we use a model of measurement of Structural Equation Model to obtain the confirmatory analysis.

Results

Exploratory factor analysis

The sample of the exploratory factor analysis consists of 173 students that at the time of the study were taking an entrepreneurial course, 99% of the students range from 18-24 years of age, 47% women, and 53% men. 42% of the participants were studying a type of Engineer career, and 57% were considering a business career. The questionnaire was composed of the dimensions we obtained from the content analysis we performed at the qualitative stage that consists of the following dimensions: instructor, resources, learning, learning satisfaction and meaning of life.

Table 3. Total variance explained

Component	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	12.770	37.559	37.559	12.77	37.559	37.559	4.308	12.670	12.670
2	4.136	12.165	49.724	4.136	12.165	49.724	4.157	12.226	24.896
3	2.710	7.970	57.693	2.710	7.970	57.693	4.142	12.183	37.079
4	1.887	5.549	63.243	1.887	5.549	63.243	4.058	11.936	49.015
5	1.452	4.270	67.512	1.452	4.270	67.512	3.823	11.245	60.260
6	1.318	3.877	71.389	1.318	3.877	71.389	3.784	11.130	71.389

In the first iteration items learning efficacy and learning satisfaction dimensions were removed and grouped in the same factor. After these changes we run the exploratory factor analysis using a Varimax rotation again, the results showed six factors with Eigenvalues greater than 1. Total variance explained with these six factors was 71%. Table four describes the results of the loadings for each factor, as well as the

percentage of variation of each of these factors and the accumulated variance.

In our analysis, the dimension of resources was split into two separate dimensions. The first items refer to the intangible resources that universities offer by advising experts. The rest of the items refer to resources that university attracts from outside networks like investors, finance alternatives, networking events and some others. The items display strong contributions to each dimension; the range goes from 0.502 to 0.887. Table four shows the details about the results from this phase.

Table 4. Factor analysis for final six factors with final items

Item Code	Components					
	1	2	3	4	5	6
Resources 6	.836	.024	.111	.257	.187	.017
Resources 7	.796	.054	.196	.195	.279	.097
Resources 8	.753	.111	.144	.160	.181	.032
Resources 9	.681	.230	.197	.223	.163	.133
Resources 10	.669	.058	.165	.381	.102	.244
Resources 11	.588	.162	.260	.329	.112	.198
Learnef 1	.086	.819	.134	.113	.113	.244
Learnef 2	.108	.818	-.021	.227	.222	.109
Learnef 3	.083	.752	.161	.028	.204	.314
Learnef 4	-.030	.704	.000	.305	.145	.320
Learnef 5	.198	.635	.078	.006	.430	.285
Learnef 6	.330	.553	.172	-.039	.391	.329
Learnef 7	.410	.518	.293	.053	.277	.237
Instructor 1	.113	.047	.887	.122	.051	.004

Instructor 2	.166	.096	.866	.121	.102	-.052
Instructor 3	.117	.043	.866	.070	.097	-.063
Instructor 4	.184	.076	.860	.181	.070	-.036
Instructor 5	.216	.119	.760	.058	.025	.270
Resources 1	.207	.102	.092	.820	.181	.189
Resources 2	.113	.050	.174	.790	.159	.172
Resources 3	.173	.132	.034	.772	.163	.164
Resources 4	.237	.156	.134	.734	.186	.101
Resources 5	.398	.110	.064	.638	-.049	-.076
Resources 6	.308	.058	.186	.502	.151	.123
Learn3	.192	.207	.039	.099	.800	.117
Learn4	.071	.166	.048	.253	.765	.144
Learn5	.254	.207	.189	.127	.710	.095
Learn2	.219	.147	.151	.172	.651	.268
Learn1	.155	.256	-.004	.202	.627	.192
Life 1	-.025	.283	-.066	.252	.132	.808
Life 2	.113	.309	.027	.147	.186	.793
Life 3	.158	.320	.062	.133	.196	.765
Life 4	.192	.267	.002	.197	.181	.755
Life 5	.159	.163	.031	.007	.497	.588

Note: Extraction Method: Principal Component Analysis. Rotation Method: Varimax with Kaiser Normalization. Rotation converged in 6 iterations.

Results of Cronbach Alpha

One of the tools commonly used to test the reliability of scales is through the Cronbach alpha coefficient (Cronbach, 1951). This coefficient reflects the internal consistency of the questionnaire, to evaluate it. One of the rules used to assess the reliability result of coefficient given is the one provided by George and Mallery (2011), who describes that α>0.9, is excellent, α>0.8, right, α>0.7, acceptable, α>0.6, questionable, α>0.5 poor, α<0.5, unacceptable. Table five shows the Cronbach´s alpha from our study. All of the dimensions are above 0.8 which is considered good regarding reliability.

Table 5. Reliability of dimensions using the Cronbach´s Alpha

Factor	Cronbach's Alpha	N of Items
Learning	.864	5
Learning efficacy	.914	7
Meaning of life	.905	5
Instructor	.925	5
Internal resources	. 910	6
External resources	. 883	6

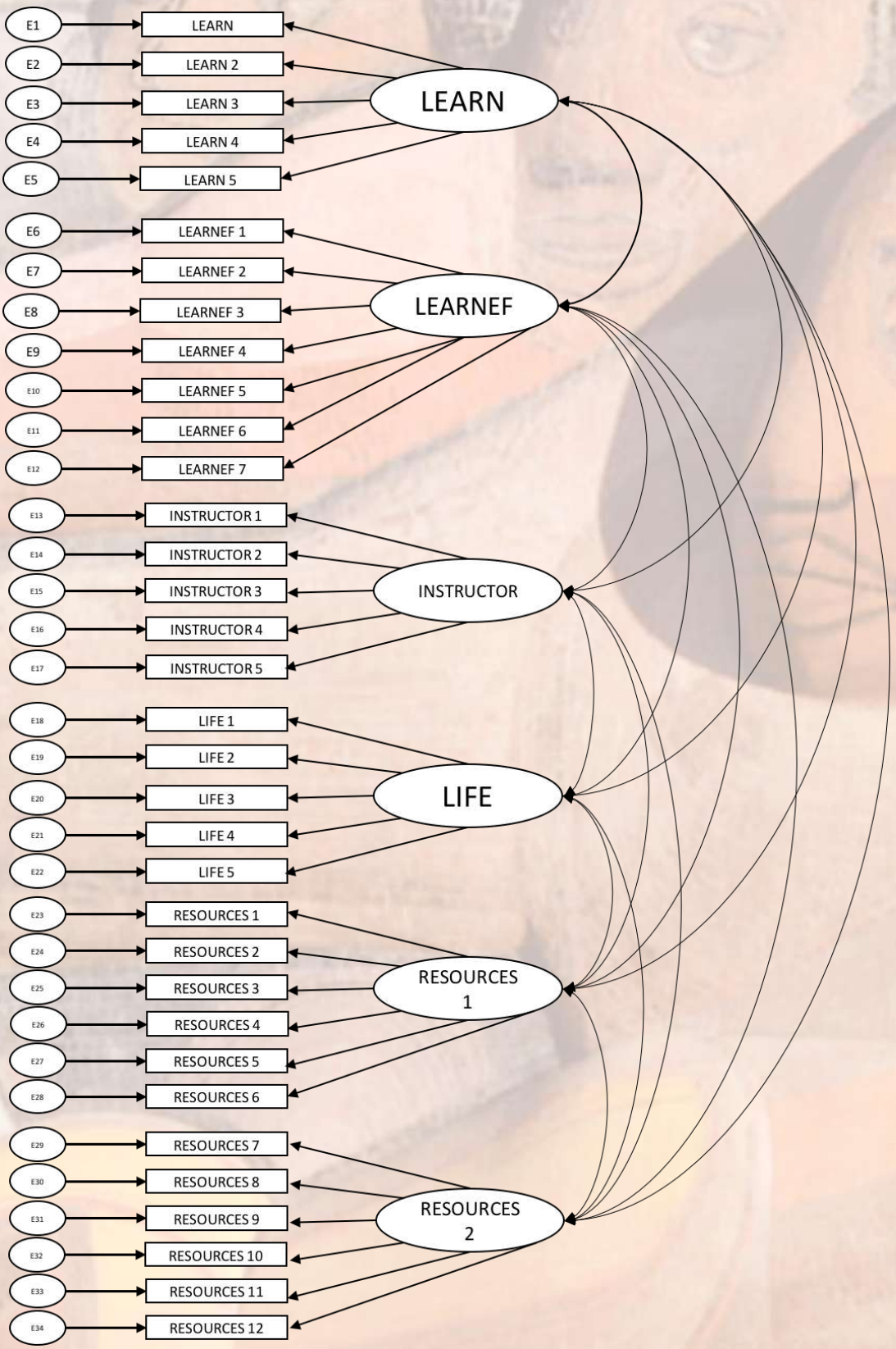
Confirmatory factor analysis

The next analysis performed was the confirmatory factor analysis; this analysis helps to confirm the relationships found in the exploratory factor analysis (De Vellis, 2016). The estimation of the six dimensions was analyzed in a model developed in AMOS Version 22 software, using maximum likelihood estimation. Figure one describes the structural equation modeling used to test the model. The results from our final model show acceptable fit indexes of X^2=1229.014 and df= 512, p-valor=0.00. Table six shows the result of various performed tests for the model fit; all of them passed the tests.

Table 6. Test for the model fit

Statistical Test	Outcome	Parameter	Source
Chi square	χ^2=1229.014 P=0.000	P<.05	
RMSEA Root Mean Square Residual	RMSEA=.090 PCLOSE=.00	RMSEA <.1	Browne and Cudeck, 1993
CMIN Minimum Value of the Discrepancy	CMIN = 2.4	CMIN >2	Byrne, 1989 pp.55
CFI Comparative Fit Index	CFI=.840	CFI=0 to1 A value close to 1 indicates a perfect fit.	McDonald and Marsh, 1990.

Figure 1. A measurement model for scales of entrepreneurial programs



Convergent and discriminant validity

For convergent and discriminant validity we calculated the average variance extracted (AVE) for each dimension. The values of AVE exceed 0.5; it means that the explained variance is greater than the variance due to error (Fornell and Larcker, 1981). We also run composite reliability, which needs to be above 0.6 in exploratory studies (Raykov, 2004), in our case results from each dimension are above this rule. To check discriminant validity we analyzed if the AVE is higher than the squared correlations of each dimension, our results confirm discriminant validity. See table 7 for a summary of the results.

Table 7. Convergent and discriminant validity

	AVE	Rho	LEARN	LEARNEF	INST	LIFE	REC1	REC2
LEARN	0.57	0.87	1					
LEARNEF	0.61	0.92	0.47	1				
INST	0.72	0.93	0.08	0.09	1			
LIFE	0.67	0.91	0.34	0.54	0.01	1		
REC1	0.57	0.94	0.26	0.19	0.11	0.22	1	
REC2	0.63	0.91	0.32	0.22	0.20	0.16	0.40	1

Note: correlations shown are squared (just with comparison purposes with Ave)

Discussion and conclusion

We address to develop a scale to measure attributes of entrepreneurial programs based on students' perceptions that are taking a course. After our analyses, we obtained an instrument with thirty-four items from five dimensions: learning, learning efficacy, resources, instructor and meaning of life. Our instrument demonstrated reliability and validity. We develop this instrument mixing items based on previous research and items proposed by us.

Consistent with previous research we highlight the importance of resources as the attribute of entrepreneurial educational education; this finding coincides with Souitaris et al., (2007). Our results also, divide

this dimension into two factors, so we consider that is necessarily separate from tangible and non-tangible resources. Our findings confirm the inclusion of learning as the dimension of entrepreneurial programs; we obtained two dimensions related to learning: learning and learning efficacy. The first one is a dimension from the education field; the second one is about effectiveness and satisfaction perceived by students.

Another vital aspect to take account of entrepreneurial education is a meaning of life; this dimension provides from our qualitative analysis links of personal expectations with the program. This contribution is necessary for entrepreneurial research because it contributes to measuring of the student´s perceptions about the courses. Future research could explore how this dimension is related to entrepreneurial intentions. We present a development of the meaning of life dimension with five items: four are proposed by us and one provided from Okudan and Rzasa (2006) study.

Previous literature mention importance of instructor role but not in entrepreneurial research, we take items from educational field and adapt to our instrument (Fiet, 2001). We develop a scale that measures important attributes of the teacher role. We concluded that this instrument allowed measuring entrepreneurial programs based on a series of attributes, which include essential elements related to entrepreneurial activities in education.

We present significant contributions: first, it is important for the academic field because we developed an instrument that includes scales to measure several attributes, which could help to understand better entrepreneurial education impact on entrepreneurial activity. Additionally, the instrument in Spanish is useful to explore entrepreneurial education in Spanish speaking environments. Second, for practitioners and education field, this instrument could help to develop strategies and courses aligned with students' perceptions and meaning of life. Moreover, it helps to distinguish key attributes to improve entrepreneurial programs.

Limitations and future research

One limitation of this study is the random sample; we used convenience sampling from different universities. For us, it was important that students were taking the entrepreneurial program at the moment of taking the survey. For this reason, our sample is limited to specific groups of students. Meaning of life was a new construct, and we used items proposed by us. It is necessary to explore these items in other entrepreneurial contexts and replicate to confirm our suggestion.

For future research, we suggest to integrate more dimensions related to entrepreneurial intentions and actions. Additional, we recommend increasing the size of the sample and testing the relation of each dimension with entrepreneurial choices. For example, to implement this scale to examine hypothesis about entrepreneurial programs and entrepreneurial intentions.

References

Bonebright, C. A., Clay, D. L., & Ankenmann, R. D. (2000). The relationship of workaholism with work–life conflict, life satisfaction, and purpose in life. *Journal of Counseling Psychology, 47,* 469–477.

Brown, T. E., Davidsson, P., & Wiklund, J. (2001). An operationalization of Stevenson's conceptualization of entrepreneurship as opportunity based firm behavior. *Strategic management journal*, 22(10), 953-968.

Browne, M.W., & Cudeck, R. (1993). Alternative ways of assessing model fit. In K.A.

Bollen y J.S. Long (Eds.), *Testing Structural Equation Models* (pp. 136-162). Thousand Oaks: Sage.

Byrne, B.M (1989). *A primer of LISREL: Basic application and programming for confirmatory factor analytic models.* New York: Springer-Verlag.

Chamberlain, K., & Zika, S. (1988). Measuring meaning in life: An examination of three scales. *Personality and Individual Differences*, 9,589–596.

Charney, A., & Libecap, G. D. (2000). Impact of entrepreneurship education (p. 45À60). Kansas City, MO: Kauffman Center for Entrepreneurial Leadership.

Chen, S. C., Hsiao, H. C., Chang, J. C., Chou, C. M., Chen, C. P., & Shen, C. H. (2015). Can the entrepreneurship course improve the entrepreneurial intentions of students? *International Entrepreneurship and Management Journal*, 11(3), 557-569.

Cronbach, L. J. (1951). Coefficient alpha and the internal structure of tests. *Psychometrika*, 16(3), 297-334.

De Pillis, E., & Reardon, K. K. (2007). The influence of personality traits and persuasive messages on entrepreneurial intention: A cross-cultural comparison. *Career Development International*, 12(4), 382-396.

DeVellis, R. F. (2016). *Scale development: Theory and applications*. Sage publications.

Fiet, J. O. (2001). The theoretical side of teaching entrepreneurship. *Journal of business venturing*, 16(1), 1-24.

Fisher, R., Maritz, A., and Lobo, A. (2014). Evaluating entrepreneurs' perception of success: Development of a measurement scale. *International Journal of Entrepreneurial Behavior and Research*, 20(5), 478-492.

Fornell, C., & Larcker, D. F. (1981). Evaluating structural equation models with unobservable variables and measurement error. *Journal of marketing research*, 39-50.

George, D., & Mallery, P. (2011). *IBM SPSS Statistics 21 step by step: A simple guide and reference*. (13th ed.). Boston: Pearson Education.

Gupta, V. K., Guo, C., Canever, M., Yim, H. R., Sraw, G. K., & Liu, M. (2014). Institutional environment for entrepreneurship in rapidly emerging major economies: the case of Brazil, China, India, and Korea. *International Entrepreneurship and Management Journal*, 10(2), 367-384.

Hallam, C., de la Vina, L., Leffel, A., & Agrawal, M. (2014). Accelerating collegiate entrepreneurship (ACE): the architecture of a university entrepreneurial ecosystem encompassing an intercollegiate venture experience. *Journal of Business and Entrepreneurship*, 26(2), 95.

Hayter, C. S. (2016). A trajectory of early-stage spinoff success: the role of knowledge intermediaries within an entrepreneurial university ecosystem. *Small Business Economics*, 47(3), 633-656

Honig, B. (2004). Entrepreneurship education: Toward a model of contingency-based business planning. *Academy of Management Learning and Education*, 3(3), 258-273.

Katz, J. A. (2003). The chronology and intellectual trajectory of American entrepreneurship education: 1876–1999. *Journal of business venturing*, 18(2), 283-300.

Keat, O. Y., Selvarajah, C., & Meyer, D. (2011). Inclination towards entrepreneurship among university students: An empirical study of Malaysian university students. *International Journal of Business and Social Science*, 2(4).

Kirby, D. A. (2004). Entrepreneurship education: can business schools meet the challenge?. *Education+ training*, 46(8/9), 510-519.

Langkamp Bolton, D., & Lane, M. D. (2012). Individual entrepreneurial orientation: Development of a measurement instrument. *Education+ Training*, 54(2/3), 219-233

Leutner, F., Ahmetoglu, G., Akhtar, R., & Chamorro-Premuzic, T. (2014). The relationship between the entrepreneurial personality and the Big Five personality traits. *Personality and individual differences*, 63, 58-63.

Liñán, F., & Chen, Y. W. (2009). Development and Cross-Cultural application of a specific instrument to measure entrepreneurial intentions. *Entrepreneurship theory and practice*, 33(3), 593-617.

Manolova, T. S., Eunni, R. V., & Gyoshev, B. S. (2008). Institutional environments for entrepreneurship: Evidence from emerging

economies in Eastern Europe. *Entrepreneurship Theory and Practice*, 32(1), 203-218.

Maritz, A., Koch, A., & Schmidt, M. (2016). The role of entrepreneurship education programs in national systems of entrepreneurship and entrepreneurship ecosystems. *International Journal of Organizational Innovation*, 8(4), 7.

Marsh, H. W. (1982). SEEQ: A reliable, valid and useful instrument for collecting students' evaluations of university teaching. *British journal of educational psychology*, 52(1), 77-95.

Matlay, H. (2008). The impact of entrepreneurship education on entrepreneurial outcomes. *Journal of small business and enterprise development*, 15(2), 382-396.

McIver, J., & Carmines, E. G. (1981). *Unidimensional scaling*. Sage, Beverly Hills, CA.

Okudan, G. E., & Rzasa, S. E. (2006). A project-based approach to entrepreneurial leadership education. *Technovation*, 26(2), 195-210.

Oosterbeek, H., Van Praag, M., & Ijsselstein, A. (2010). The impact of entrepreneurship education on entrepreneurship skills and motivation. *European economic review*, 54(3), 442-454.

Phan, P. H., Wong, P. K., & Wang, C. K. (2002). Antecedents to entrepreneurship among university students in Singapore: beliefs, attitudes and background. *Journal of Enterprising Culture*, 10(02), 151-174.

Raykov, T. (2004). Behavioral scale reliability and measurement invariance evaluation using latent variable modeling. *Behavior Therapy*, 35(2), 299-331.

Rideout, E. C., and Gray, D. O. (2013). Does entrepreneurship education really work? A review and methodological critique of the empirical literature on the effects of university-based entrepreneurship education. *Journal of Small Business Management*, 51(3), 329-351.

Ryff, C. D., & Singer, B. (1998). The contours of positive human health. *Psychological Inquiry*, 9, 1–28.

Sobel, R. S., and King, K. A. (2008). Does school choice increase the rate of youth entrepreneurship?. *Economics of Education Review*, 27(4), 429-438.

Souitaris, V., Zerbinati, S., & Al-Laham, A. (2007). Do entrepreneurship programs raise entrepreneurial intention of science and engineering students? The effect of learning, inspiration and resources. *Journal of Business venturing*, 22(4), 566-591

Shepherd, D. A., & DeTienne, D. R. (2005). Prior knowledge, potential financial reward, and opportunity identification. *Entrepreneurship theory and practice*, 29(1), 91-112.

Souitaris, V., Zerbinati, S., and Al-Laham, A. (2007). Do entrepreneurship programs raise entrepreneurial intention of science and engineering students? The effect of learning, inspiration and resources. *Journal of Business venturing*, 22(4), 566-591.

Tinsley, H. E., and Tinsley, D. J. (1987). Uses of factor analysis in counseling psychology research. *Journal of counseling psychology*, 34(4), 414.

Wilson, F., Kickul, J., and Marlino, D. (2007). Gender, entrepreneurial self-efficacy, and entrepreneurial career intentions: implications for entrepreneurship education. *Entrepreneurship theory and practice*, 31(3), 387-406.

Zellweger, T., Sieger, P., and Halter, F. (2011). Should I stay or should I go? Career choice intentions of students with family business background. *Journal of Business Venturing*, 26(5), 521-536.