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ENTREPRENEURSHIP EDUCATION EVALUATION: A PROPOSITION TO USE SITUATIONAL JUDGMENT TESTS

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Entrepreneurship education is growing around the world to develop more and better entrepreneurs. Despite its importance, the outcomes of entrepreneurship education are still controversial and poorly measured. Researchers usually assess students' intentions, attitudes, number of startups created or the business growth. These measures fail to assess changes in students' behaviors resulting from entrepreneurship courses. Furthermore, most research uses self-perception measures, which are not performance-based and behavior-oriented measures. Therefore, this theoretical essay proposes the use of taxonomy, so course goals are described in terms of observable behaviors and can be properly measured. Still, it is proposed that entrepreneurship education could be assessed in a more objective manner, using situational judgment tests (SJTs). The SJTs present typical work-related situations to students and, based on their answers, assess their knowledge and behaviors. This makes SJTs a powerful instrument to assess learning and competence development.

Keywords: Entrepreneurship Education. Learning Outcomes. Situational Judgment Tests.

Introduction

Entrepreneurship is important to solve global economic, social and environmental problems (Greene, Fetters, Bliss & Donnellon, 2019). Therefore, entrepreneurship education (EE) is growing around the world. In the USA more than 2300 colleges and universities offer entrepreneurship courses nowadays, whereas in 1970 only 16 did (Bauman & Lucy, in press). There is consensus that entrepreneurship can be taught (Kuratko, 2005; Mwasalwiba, 2011), but more research is needed to understand its outcomes (Martin, McNally & Kay, 2013; Nabi, Linan, Fayolle, Krueger & Walmsley, 2017).

Most studies on impact focuses on Ajzen's (1991) Theory of Planned Behavior as a point of departure, revolving around that notion that intentions are predictors of entrepreneurial behavior. These studies provide little information about the development process of entrepreneurial competences, and about the relationships between characteristics of learning environments and students' entrepreneurial competence performance (Lans, Baggen & Ploum, 2018).

Learning refers to the processes of retention, generalization and application of knowledge, skills and attitudes (KSAs) acquired during training (Baldwin & Ford, 1988; Ford & Weissbein, 1997). According to Gagne and Medsker (1996), learning is observed through change in behavior and can be inferred by comparing the individuals' behavior before and after the learning situation (Gagne & Medsker, 1996). Therefore, entrepreneurship learning outcomes can be the achievement of certain competences (Man, 2012).

Assessing entrepreneurship education learning outcomes is not an easy task because learning objectives are poorly or not described at all in the EE research (Martin et al., 2013; Fayolle, 2013). If objectives are not well described, it is harder to know what professors expect students to learn, and how they can do it. The experiences of entrepreneurship educator rarely relate to Anderson's et al. (2001) taxonomy to precisely define the learning goals of their courses. Therefore, learning activities and evaluation processes are not appropriately defined (Fayolle, 2018)

Well-described educational goals help professors describe the behaviors expected from students, and content topics on which behavior will be performed (Anderson et al., 2001). They describe the expected, observable behaviors that result from learning. We propose that entrepreneurship educators use Andersons' et al. (2001) taxonomy when designing their courses. Properly defining educational objectives helps educators understand what is important for students to learn; how instruction should be planned and delivered to ensure high levels of learning for a larger number of students; and how to select or design appropriate assessment instruments that provide accurate information about what students are learning (Anderson et al., 2001).

Even though learning outcomes are the development of competencies, and that competencies are observable and behavior-centered (Man, 2012), most learning outcomes of entrepreneurship courses in higher education are usually assessed exclusively through exam scores (Mwasalwiba, 2011). These exam scores are declarative-knowledge tests that only require students to recall the contents they have learned and not to demonstrate their behavior (Duval-Couetil, 2013). Therefore, these are not proper measures of learning outcomes (Gagne & Medsker, 1996). Also, researchers tend to use self-report measures of learning which can cause biases, due to social desirability (Bell, Tannenbaum, Ford, Noe & Kraiger, 2017).

As competences are a latent construct, assessing them always involve interference. Self-assessment questionnaires capture perceptions of feelings at that moment, instead of competencies underlying performance (Lans et al., 2018). If the student had no previous experience with that situation or competence, they may believe they are not competent and therefore self-evaluate themselves with a low grade. On the contrary, when presented to the situation and asked what one would do, students can give an honest answer, not so worried with their own judgment. Therefore, the assessment of entrepreneurial competences should be behavior-based (Schelfhout, Bruggeman & De Maeyer, 2016), performance-based and invite learners to show behavior as close to reality as possible using scenarios, cases, simulations and others (Lans et al., 2018).

Still, the existing instruments that measure entrepreneurial competences and learning were developed to assess the competences of individuals who already run a business. The question remains as to which competences undergraduate students can and should develop trough entrepreneurship courses if they are not ready or do not want to start a business right away, but may intend to do so in the future.

Therefore, the use of Situational Judgment Tests (SJTs) to assess entrepreneurship education learning outcomes is proposed. The SJTs present typical work-related situations to respondents and ask them to answer what they should or would do in those situations and, therefore, are good performance predictors (Whetzel & McDaniel, 2009). The SJTs are low-fidelity simulations (Lievens & Soete, 2015) that enable assessing people's knowledge and behaviors by means of their answers, becoming a powerful tool to assess learning and competence development.

To achieve its goal, this article analyzes the literature on entrepreneurship education, entrepreneurship education assessment, entrepreneurial competences and entrepreneurial learning to propose a more objective and performance-based way of evaluating entrepreneurship education learning outcomes: the situational judgment tests. Articles were researched in two data bases, Science Direct and Scopus. Articles published in the last ten years and those considered classics were included and reviewed to compose this essay.

Entrepreneurship education

Entrepreneurship education relates to personal development, and helps students develop their talents, feel more independent and achieve their dreams. It also helps students to see venture creation as a possible career option and improve their attitudes towards entrepreneurship (Fayolle, 2018). The goals of entrepreneurship education are to transmit techniques and tools that help students increase the chances of new venture creation, survival and success (Fayolle, 2018; Ramani, Solomon & Alabduljader, 2018).

There are different types of entrepreneurship courses or programs, depending on their focus, audience and level. Target groups found in literature are business students, entrepreneurs, SME managers, employees, non-business students in universities, policymakers, investors, unemployed and minority groups (Mwasalwiba, 2011). Fayolle (2013) points out that research failed to describe how different target audiences influence goals, contents and methods chosen by educators to best fit each of these audiences.

Fayolle (2013) also argues that the goals of entrepreneurship courses are not well described, making it more difficult to understand what students should learn, which competences can be developed and why instructional designs are chosen. Research usually presents only a brief list of courses used in courses, rather than presenting the goals of the courses. Common topics are resource acquisition, finance, marketing, idea generation, opportunity recognition, business planning, managing growth, human resources, management, new venture creation, legal issues, family business, franchising, negotiation skills, problem-solving and communication skills (Mwasalwiba, 2011).

Pedagogies vary considerably, and the most frequently used are traditional lectures, active learning, simulations, games, mentoring, guest speakers (Pittaway & Cope, 2007), learning-by-doing and blended learning (Fayolle, 2013). Discussion regarding if approaches should be more hands-on or theoretical are still very common, but it is known that courses should be based on the real world, so students can understand and apply what they are learning (Henry, Hill & Leitch, 2005).

Neck and Greene (2011) present different approaches (or worlds, as they call it) that can be adopted to teach entrepreneurship. These are not presented as a timeline, but help us understand how the field evolved over the years (Neck & Greene, 2011). The first approach is the entrepreneur world, in which the entrepreneur and its psychological and behavioral characteristics are central. Pedagogies adopted are usually lectures, exams and the participation of guest speakers. As the focus is to describe successful entrepreneurs and their attributes, students would see it as “a box, in which they fit or not” (Neck & Greene, 2011, p. 58). If students do not think they have these attributes, they can be less motivated or develop negative attitudes towards entrepreneurship (Neck & Greene, 2011).

Next, they present the process approach, which considers entrepreneurship as a predictable process from the venture creation to exit. The process is taught in a linear way, usually using business plans and case studies. The problem is that students draft business plans even before the business concept is validated, thus making it useless (Neck & Greene, 2011). The cognition approach also focuses on the process, but it is also concerned with the role the entrepreneur plays in that process, how one thinks and makes decisions entrepreneurially, leading to the creation of mental models. Pedagogies used are often simulation and cases studies.

Ultimately, the authors defend entrepreneurship as a method, because entrepreneurship is not predictable and demands action. Understanding how entrepreneurs think is not enough.

It is necessary to act, practice and apply concepts that enable the individual to become an entrepreneur, instead of only talking about it. This approach recognizes that entrepreneurship can be taught, and the pedagogies mostly used are serious games, simulations, designed-based learning and reflective practice (Neck & Greene, 2011).

The goals of entrepreneurship education are to transmit techniques and tools that help students increase the chances of new venture creation, survival and success. It is a good opportunity to help people discover what business works for them and how to think in a more critical and innovative way (Fayolle & Gailly, 2008). There is a continuum of the intended entrepreneurship education outcomes. At a minimum, it is expected that students learn about entrepreneurship, which is achieved through lectures and passive learning strategies. It is even better if students develop an entrepreneurial mindset and ideally start their own business, or effectively practice entrepreneurship (Neck & Corbett, 2018). Outcomes will be deeply discussed next.

Entrepreneurship education outcomes

Even though entrepreneurship education is growing around the world, there is not enough evidence that it helps create better entrepreneurs (Martin et al., 2013). Only a few articles have assessed the influence of entrepreneurship education in short- and long-term results on students' attitudes, competence, behavior and career goals (Duval-Couetil, 2013). Benefits associated with assessment refer to the capability of delivering improved education for students, creation of basic standards for scholars and legitimating of the program with different stakeholders, which could help fundraising (Duval-Couetil, 2013).

A common discussion among entrepreneurship educators and researchers is how to properly assess its impacts, what metrics to use, the appropriate methods and resource constraints, considering that it demands a lot of time, money and skilled people (Duval-Couetil, 2013). Assessment should answer questions like: what should students learn? What should they be able to do by the end of the program? Have they learned? Can learning be improved? (Duval-Couetil, 2013).

Studies that measure entrepreneurship education impacts focus primarily on short-term results and subjective impact measures such as entrepreneurial attitudes and intentions, rather than on long-term results like new venture creation and business performance (Loi, 2018). Maritz and Brown (2012), in their literature review, found that outcomes usually researched are skills, knowledge, attitudes, careers, self-efficacy, intentionality, competitiveness, behaviors, practical learning, jobs created, number of participants, perceptions, satisfaction and return on investment.

Martin et al. (2013) have conducted the first meta-analysis that evaluated entrepreneurship education outcomes grounded on the human capital theory. They found that the entrepreneurship human capital assets that have been researched are knowledge of the entrepreneurial process, competence in identifying innovative business opportunities, competence in dealing with ambiguity in decision-making, positive perceptions of entrepreneurship, attitudes towards entrepreneurship, self-efficacy, intention to become an entrepreneur. Entrepreneurial outcomes usually investigated are nascent behavior, startups opened, entrepreneurship performance and success (Martin et al., 2013). In addition, Nabi et al. (2017) conducted a systematic review and found that the most common impact indicators researched are: attitude, skills and knowledge, feasibility, entrepreneurial intention, followed by new startups and venture performance.

Duval-Couetil (2013) reviewed assessment instruments used in entrepreneurship education and grouped them into three categories. There is a course level evaluation that measures students reactions to a specific class or activity; instruments that evaluate interest, knowledge, satisfaction, career choices, venture creation, number of new firms, innovation, firm performance, impacts on the community; and instruments that measure specific entrepreneurship constructs, such as entrepreneurial intention, self-efficacy and empathy with entrepreneurial life.

Duval-Couetil (2013) also distinguishes between four categories of educational assessment. Summative assessment is periodical and determines what students know and do not know. These are usually midterm or final exams, final projects and tests applied after each unit. Formative assessment provides real-time feedback that helps improve learning like observation, questioning and peer assessment. Indirect assessment asks students to reflect on learning rather than demonstrating it, like surveys, focus groups and interviews. Direct assessment is based on demonstrable behaviors, like standardized tests, assignments and activities. There is a need to balance assessment approaches for the proper program evaluation (Duval-Couetil, 2013).

Researchers have found both positive and negative results regarding entrepreneurship education, mostly because research is below the expected methodological rigor. They do not use pre-and-post-measures or control groups, which should be done to improve research and provide better and comparable results (Martin et al., 2013). The quality of research has been questioned, especially because samples are usually of individuals who were already interested in entrepreneurship (and may be self-selected), and because of the lack of use of control groups and the need for more longitudinal research, obtaining long-term results (Duval-Couetil, 2013).

The characteristics of the audience should be considered when evaluating EE, because participants may have different learning styles, learning needs and expected outcomes. Research should consider sociodemographic differences such as gender, age, income, marital status, stage of venture, type of degree, major, diversity, internationalization, background, social environment and psychological characteristics (Maritz & Brown, 2012).

Learners have different intentions, motivations and previous knowledge that affect the course outcomes. Compulsory and elective courses will attract different students, and this should be considered when evaluating the course (Mwasalwiba, 2011). Family background and friends' opinions about entrepreneurship can also influence their motivation and attitudes towards entrepreneurship, and should also be considered (Matlay, 2006).

The course objectives, content, audience and contexts are interrelated (Maritz & Brown, 2012). The description of objectives should be a priority in entrepreneurship education assessment. The main objectives found by Maritz and Brown (2012) are (a) awareness education, increasing the amount of people knowledgeable about entrepreneurship; (b) help people become entrepreneurs; (c) encourage new startups; (d) develop technical skills; (e) develop business management skills; (f) develop personal skills; (g) develop personal traits; and, (h) economic outcomes. Objectives should also be described according to contextual factors.

Contextual factors such as economic environment, entrepreneurial culture, whether the institution is private or public, program size, how it is funded, students and faculty characteristics and the department in charge can deeply influence learning outcomes and should be described in detail (Duval-Couetil, 2013). Despite this recommendation, articles tend to under describe contextual factors.

Articles also provide only a brief presentation of the course and the students' profile. To our knowledge, none of these provides complete information regarding general environment information, university description, students' and scholars' background and most importantly, learning goals. Martin et al. (2013) state that courses syllabuses should be reported, and learning goals and teaching methods should be described. Without this information, assessment programs are compromised and are hardly generalizable. Therefore, entrepreneurial competences and learning will be presented next.

Entrepreneurial Competences

Entrepreneurial competences are grounded in the theory of competence and bear many applications and meanings. There are many definitions of competence (Mulder, Guilkers, Biemans & Wesselink, 2009) and terms like abilities, skills, expertise, behaviors and characteristics are often used as synonymous (Mitchelmore & Rowley, 2013) making it difficult to reach a common definition for competences and entrepreneurial competences. Researchers have produced an endless list of entrepreneurial competences, but there is still no consensus on taxonomy of the expected competences to be developed in entrepreneurship courses (Lans et al., 2018).

There are two uses for the term. Competence, mostly used by the European or UK School, is the description of the activities someone needs to perform at work, or the behaviors and action they should present in the workplace (Mitchelmore & Rowley, 2010). These are the knowledge, skills and attitudes necessary to act, solve problems and achieve the desired performance in jobs, organizations, roles and situations (Mulder et al., 2009). Competency, in turn, means the traits, skills, knowledge and motivation that lead individuals to high-quality performance at work (Mitchelmore & Rowley, 2010). These are preferred by the American School and are usually used to characterize individuals and their behaviors (Mitchelmore & Rowley, 2010). According to Mulder et al. (2009) competency is a part of a competence, an element that can be either behavior-oriented or task-oriented.

A competent individual is not the one who merely possesses the competency, but the one who has the necessary knowledge, skills and attitudes to present a competent behavior (Man & Lau, 2005). One can affirm that an individual is competent when his/her behavior is observable and measurable (Bird, 1995; Man & Lau, 2005). If competences are observable, they reveal more than intrapsychic characteristics and can be learned and modified over time (Bird, 1995; Man, Lau & Chan, 2002; Morris, Webb, Fu & Singhal, 2013). Competences are latent constructs, meaning that competence is not consistently present in performance. These are context-dependent and vary according to culture, industry, networks, lack or presence of peers, and the supporting structure. These are learnable and further investigation is necessary to understand how people learn entrepreneurial competencies and which entrepreneurial competencies they learn (Lans et al., 2018).

Entrepreneurial competences are performed by individuals who start and transform new ventures (Mitchelmore & Rowley, 2010). In their literature review, Mitchelmore and Rowley (2010) found that researchers usually relate entrepreneurial competences to venture birth, survival, performance and growth. There is also an increased interest in corporate entrepreneurship. Bird (1995) believes that entrepreneurial competencies are "defined as underlying characteristics, such as generic and specific knowledge, motives, traits, self-images, social roles and skills which result in venture birth, survival and/or growth" (Bird, 1995, p. 51).

Man, Lau and Snape (2008) believe that competent entrepreneurs perceive innovation opportunities, develop new products and services, and lead firms to growth (Man *et al.*, 2008).

Chandler and Jansen (1992) argue there are three roles that entrepreneurs take on, which are associated with competencies: the entrepreneurial role, the managerial role and the technical role. Using a seven-point Likert scale, self-report instrument with 21 items, researchers surveyed 134 firm founders and identified five competence factors related to business performance, namely: human/conceptual competence (7 items); ability to recognize opportunities (4 items); drive to see venture through to fruition (4 items); technical competence (3 items); and, political competence (3 items). Bird (1995) argues there are standard, basic or minimum competencies that every entrepreneur should possess and that are fundamental for starting a business. The author also advocates for success competencies that guarantee the business survival, growth and success.

Based on the concept of competitiveness, Man et al. (2002) related competencies with corporate performance and proposed a theoretical framework regarding those topics. They found six competency areas in literature, namely (1) opportunity competencies related to recognizing and developing market opportunities; (2) relationship competencies related to the entrepreneurs' contacts and connections and their ability to persuade, communicate and relate to people; (3) conceptual competencies related to different conceptual skills like decision-making, risk-taking, innovativeness and others; (4) organizing competencies that refer to the organization's internal and external resources and the way the entrepreneur deals with them; (5) strategic competencies related to the formulation, evaluation and implementation of strategies to the firm; and, (6) commitment competencies, which are the ones that make the entrepreneur persist and continue the business.

To confirm these findings, Man et al. (2008) developed an instrument to measure entrepreneurial competencies after a qualitative study in which they interviewed 19 successful entrepreneurs. They adapted items from scales found in literature, and surveyed 153 SME owners in Hong Kong using a 53-item instrument. The factor analysis generated 10 factors for entrepreneurial competencies, namely relationship, analytical, innovative, opportunity, strategic, human, operational, commitment, personal strength and learning competencies.

From their literature review, Mitchelmore and Rowley (2010) proposed a summary for entrepreneurial competencies in four groups: entrepreneurial competencies; business and management competencies; human relationship competencies; conceptual and relationship competencies. In turn, Morris et al. (2013) argue that entrepreneurial competencies are not well distinguished from business and management competencies and, although the last ones are necessary for the business survival, alone they do not address the specificities of the entrepreneurial context. Therefore, the authors intended to better understand what entrepreneurial competencies are critical for the firms' performance and success, and conducted a three-round Delphi approach with successful entrepreneurs and academics. Thirteen groups of competencies were identified in the Delphi study: opportunity recognition; opportunity assessment; risk management; conveying a compelling vision; tenacity/perseverance; creative problem solving/imaginativeness; resource leveraging; guerrilla skills; value creation; maintain focus, yet adapt; resilience; self-efficacy; building and using network.

Kyndt and Baert (2015), in turn, developed and tested an instrument that measures important competencies for entrepreneurs. The key competency areas they have identified are perseverance; self-knowledge; orientation towards learning; awareness of potential returns; decisiveness; planning for the future; independence; ability to persuade; networks-building;

seeing opportunities; insight into the market; socially and environmentally conscious conduct. Table 1 presents a summary of the main entrepreneurial competencies found in previous research.

Table 1
Competencies and competences from previous research

Competence/ competency	Authors
Opportunity	Chandler and Jansen (1992); Kyndt and Baert (2015); Man et al. (2002); Man et al. (2008); Mitchelmore and Rowley (2010); Morris et al. (2013);
Conceptual	Chandler and Jansen (1992); Man et al. (2002); Mitchelmore and Rowley (2010); Morris et al. (2013)
Technical	Chandler and Jansen (1992); Man et al. (2008)
Relationship	Chandler and Jansen (1992); Kyndt and Baert (2015); Man et al. (2002); Man et al. (2008); Mitchelmore and Rowley (2010); Morris et al. (2013)
Management	Man et al. (2002); Mitchelmore and Rowley (2010)
Strategic	Man et al. (2002); Man et al. (2008); Kyndt and Baert (2015)
Market analysis	Man et al. (2008); Morris et al. (2013); Kyndt and Baert (2015)
Innovativeness	Man et al. (2008); Morris et al. (2013)
Persuasion	Kyndt and Baert (2015); Morris et al. (2013)
Commitment	Man et al. (2002); Man et al. (2008)
Perseverance	Kyndt and Baert (2015); Morris et al. (2013)
Self-efficacy	Morris et al. (2013)
Self-knowledge	Kyndt and Baert (2015)
Learning	Kyndt and Baert (2015); Man et al. (2008)
Drive	Chandler and Jansen (1992); Man et al. (2008); Morris et al. (2013)

Source: prepared by the author

Most of the research that measure entrepreneurial competencies use self-report and self-perception measures (Chandler & Jansen, 1992; Man & Lau, 2005; Man et al., 2008; Morris et al., 2013). Bird (1995) points out several methods that can be used to measure entrepreneurial competencies, and that can be quantitative, qualitative, self-reports, objective, retrospective or current, like: self-reflective diaries; observation; oral history; retrospective reconstruction of events; critical event interviewing; simulations; games; participant observations; and others. Mitchelmore and Rowley (2013) also mention that interviews, expert observation and case studies can be used to replace or complement self-report measures.

Entrepreneurship education can foster the development of competencies, and educators should provide students with information about what to expect and how to respond to entrepreneurial experiences (Morris *et al.*, 2013). If competencies are learnable and depend on experience, there should be more research about how entrepreneurs learn (Bird, 1995).

Entrepreneurial Learning

Learning refers to the processes of retention, generalization and application of knowledge, skills and attitudes (KSAs) acquired during training (Baldwin & Ford, 1988; Ford & Weissbein, 1997). According to Gagne and Medsker (1996) learning is expressed as a change in behavior, typically increased capability for some type of performance. It is a relatively permanent change in human behavior that is not explained by other life events, such as growing and maturing processes (Gagne & Medsker, 1996).

Rae (2000) states that when learning is applied to entrepreneurship, it means learning how to work in entrepreneurial ways and act to identify and develop opportunities and manage ventures. It is not only about acquiring knowledge, but also acting on opportunities. Accordingly, Politis (2005) describes entrepreneurial learning as a process to acquire knowledge to start and manage new ventures. Man (2012) also states that it is necessary to pay attention to outcomes of learning behaviors, because once these are identifiable, they can be better measured and generalizable. Therefore, learning outcomes can be the achievement of certain competences (Man, 2012).

Cope (2005) proposes that entrepreneurs should learn about themselves (strengths and weaknesses, personal interests, motivations, areas for personal development); about the business (opportunities and threats, areas for development); about the environment and networks (how to manage relationships with customers, suppliers and competitors); and about small business management (how to effectively control the business, financial management).

There is a common sense that entrepreneurial learning is an experiential (Rae, 2000; Politis, 2005; Cope, 2005, Man, 2012), cognitive, interactive and iterative process (Man, 2012), and that entrepreneurs usually learn by doing (Cope, 2005). Therefore, most researchers use the critical incidents method to assess entrepreneurial learning from experience. As students may not own a business yet, that measure may be not appropriate to assess entrepreneurship education learning outcomes.

If entrepreneurial learning is achieved through experience or learning-by-doing, to what extend can people prepare for and learn about entrepreneurship before starting their business (Cope, 2005)? Perhaps, that is the main purpose of entrepreneurship education. If professors want to help students learn about entrepreneurship and to became entrepreneurs, they should define their education objectives so as to reflect which competencies will be developed.

That is not an easy task and can be facilitated using the taxonomy framework proposed by Anderson et al., (2001). It is a two-dimensional framework – the cognitive process dimension and the knowledge dimension - and each of them contains different levels of complexity. The cognitive process dimension comprises six categories: remember, understand, apply, analyze, evaluate and create. The knowledge dimension comprises four categories: factual, conceptual, procedural and metacognitive. An objective should be assigned to one of the categories of both dimensions, so it can be better understood. These should be phrased using "students will be able to" or "students will learn to" (Anderson et al., 2001). When objectives are defined using this taxonomy table, they are more easily assessed in terms of expected and observable behaviors.

For example, if the global learning goal is "students should learn to identify and evaluate business opportunities" a professor may define the following educational objectives: (1) remember sources of business opportunities; (2) recognize the characteristics of good business opportunities; (3) compare different business segments; (4) analyze one's personal business interests; (5) choose a business segment; (6) collect data about population information in a city

or state; (7) identify how many businesses in the selected segment exist in the chosen city; (8) talk to experts in that type of business; (9) talk to possible customers; (10) collect data about competitors; (11) search for legal and bureaucratic information regarding that type of business; (12) search for possible locations for the business; (13) calculate the required investment; (14) organize all the information obtained into a document that will help decision-making, (15) decide if the business opportunity is profitable or not; (16) use all the information obtained to decide if the business opportunity should be pursued or not.

As these are specific and classified in terms of complexity it is possible to develop instructional materials, activities and assessment instruments that meet each of the objectives. Assessing performance is a good strategy to evaluate learning outcomes, as performance assessments are used as inferences of what students have learned, as described in the objectives (Anderson et al., 2001). Table 2 provides an example of instructional objectives for entrepreneurship education.

Table 2
Example of instructional objectives for entrepreneurship education

The Knowledge dimension	The cognitive process dimension					
	Remember	**Understand**	**Apply**	**Analyze**	**Evaluate**	**Create**
Factual Knowledge						
Conceptual Knowledge	Objectives 1 and 2					
Procedural Knowledge		Objective 3	Objectives 6, 7, 8, 9, 10, 11, 12 and 13	Objectives 5 and 14	Objectives 15 and 16	
Metacognitive Knowledge				Objective 4		

Source: prepared by the author

If entrepreneurial learning is a process of changing one's behaviors (Man, 2012), we propose situational judgment tests as a good way of assessing students' performance and behaviors and, consequently, what they have learned. Therefore, situational judgment tests will be presented next.

Situational Judgment Tests

Situational Judgment Tests (SJT) are a low-fidelity measurement tool commonly used as a selection tool in human resources (Fritzsche, Stagi, Salas & Kurke, 2006) The SJTs capture job-related competences and skills (Lievens, Peeters & Schollaert, 2008) as they present to respondents typical work-related situations and ask them to respond what they should or would do in each of them (Whetzel & McDaniel, 2009). Therefore, SJTs can be better performance predictors than other methods, like self-report measures (Whetzel & McDaniel, 2006; (Motowidlo, Hooper & Jackson, 2006). Lans et al. (2018) suggest the use of SJTs to assess entrepreneurial competencies, in which participants are presented to a scenario and chose an alternative that state what they would do in a given situation.

SJTs are highly efficient, have lower costs and greater flexibility when compared to other simulation tools (Fritzsche et al., 2006) and, therefore, can be administered to larger samples (Lievens & de Soete, 2015). These are low-fidelity instruments because respondents

do not have to demonstrate actual behaviors, but are supposed to answer questions in written or video formats that describe future job situations (Lievens & de Soete, 2015).

The development of SJTs usually requires three phases. First, job analysis should be conducted to identify knowledge, skills and attitudes considered crucial to performance. These competencies can be obtained from critical incidents of work situations that are gathered from subject matter experts or archival sources. The developers should select the best and non-redundant critical incidents and rewrite them in the form of test items (Lievens & de Soete, 2015). For entrepreneurship education evaluation purposes, educators should define their learning goals, the competencies they expect students to develop during the course, and situations in which these competencies are to be demonstrated.

Second, response options should be developed. A good way to do that is to present them to subject matter experts and nonexperts, so they can formulate responses to each of the situations. Responses should try to cover a wide range of effectiveness. The last step is to develop the scoring keys, which can be rational or empirical. To develop rational scoring keys, experts are asked to identify the worst and best responses according to the expected performance. Empirical scoring does not use experts' judgment. Tests are submitted to a large sample and their answers are analyzed to identify the ones considered higher job performance and worst job performance by the respondents. Those answers will become the scoring keys for the tests (Lievens & de Soete, 2015). Different scoring keys can make SJTs measure different constructs. There is not a consensus in literature regarding which one is the best option, so this issue can be further investigated (Whetzel & McDaniel, 2009).

As SJTs measure job-related situations, and usually problems encountered at work, content and context are very important issues that can affect outcomes, and that should be elaborated carefully. The meaning of the situation should be understood from the test-takers' point of view. Therefore, it is very important to use pilot tests to get opinions about instructions, modality, item format, item order and test individual versus group compositions. Context should be described in detail when reporting results, so results can be better analyzed (Gessner & Klimoski, 2006).

When developing SJTs, it also is important to consider some design issues. The first one regards item length. Some SJTs provide short and simple situational description and others provide long and detailed ones. Items can vary according to context, that is, some are designed to measure specific competencies for specific jobs, while others are general and measure competencies applicable to several job situations (Lievens & de Soete, 2015). Developers should also consider the desired item interactivity. Traditional ones provide all respondents with the same sequence and others take the test-takers' previous response to form new items based on their former decisions. Their decision has a consequence in the next item (Lievens & de Soete, 2015).

Regarding stimulus modality, tests usually present written descriptions of job situations to participants. As technology evolves and developers try to make the test more similar to the actual job situation, video-based multimedia stimuli are being increasingly used. Using interactive items or video-based SJTs increased participants' levels of test acceptance (Whetzel & McDaniel, 2009).

As to response modality, the text-based multiple-choice format is typically used. Single response items have also been used. In this case, experts must only determine items as extremely ineffective or highly effective (Lievens & de Soete, 2015). Whetzel and McDaniel (2009) recommend asking respondents to rate each response option on a Likert scale, because

that increases the number of possible responses (if you have 10 situations and 5 response options, you will have 50 scorable items). They often recode the answers in dichotomies, so responses are identified as effective or ineffective, to remove individual differences in the use of rating scales.

The decision regarding response instructions is also important. Knowledge-based instructions usually ask test-takers what they *should do* in each situation, or their knowledge regarding the *best and worst* answer. This type of test measures maximal performance. On the other hand, behavioral-based response instructions ask respondents what they *would do* in each situation and, therefore, are considered typical performance measures (Lievens & de Soete, 2015; Motowidlo et al., 2006).

It is not easy to estimate the reliability of the SJTs because they usually measure more than one construct, and an item can be correlated with more than one construct, thus not having a unidimensional loading in factor analysis, making Cronbach's alpha an inappropriate reliability index. Other possible strategies are test-retest reliability and parallel form, but these are rarely reported in literature (Whetzel & McDaniel, 2009).

There are usually two kinds of evidence of SJTs validity, related to the constructs measured and concerning the prediction of job performance. Construct-related validity evidence is related to response instructions that can be knowledge-based or behavior-based. Knowledge instructions ask respondents to choose the correct or best possible answer. Behavior-based instructions ask respondents what they would do in each situation. These are important issues, because response instructions may change the construct validity and even the constructs being measured. SJTs with behavioral tendencies tend to be more correlated to personality, while knowledge-based instructions tend to be more correlated to cognitive ability (Whetzel & McDaniel, 2009).

Faking can be a problem in SJTs and must be expected. Faking refers to the respondents' distortion of responses to score favorably. Knowledge-based tests have lower chances of faking, probably because knowledge is harder to fake than the expected behavior (Whetzel & McDaniel, 2009).

Fritzsche et al., (2006) argue that "SJTs could provide training evaluation that is targeted at the learning level of Kirkpatrick's taxonomy" (p. 310). Kirkpatrick's (1959) taxonomy proposed four levels of training outcomes: (1) reactions, or how much participants liked the program; (2) learning or the knowledge, facts and skills that trainees learned; (3) behavior changes that can be observed on the job; (4) results, or changes at the organization that resulted from training.

As discussed in an earlier section, entrepreneurship education outcomes mostly researched are: intention, attitudes, self-efficacy, perceptions, knowledge, skills, start-ups created, existing companies growth. Therefore, the second level of entrepreneurship training evaluation proposed by Kirkpatrick and others, namely *learning*, hasn't been widely evaluated. Learning should be assessed through performance measures (Bell et al., 2017). Thus, we propose that SJTs are used as a measurement tool to assess entrepreneurship education learning outcomes considering all theoretical and methodological issues proposed in this article.

Conclusions

To assess outcomes of entrepreneurship education, scholars need to know what entrepreneurship courses are capable of teaching, which competences can be developed, what students can learn, and, consequently, what are the expected changes in knowledge and

behavior. That is only possible if courses' global, educational and instructional goals are well-defined, and if there is a common agreement and clarity regarding which competencies entrepreneurship education can develop.

To achieve that, a common taxonomy of entrepreneurship education should be proposed. Teachers should describe their educational and instructional objectives according to their complexity levels. These should be described using the cognitive and knowledge dimensions. If objectives are well-elaborated, learning outcomes will be observable through changes in students' behaviors. The objectives must be well aligned with chosen activities, pedagogies, contents and assessment methods. If objectives are clear, specific and well-defined, they can be assessed in more objective ways like using situational judgment tests as proposed in this article.

Furthermore, as learning and competencies are context-dependent, researchers should provide better and detailed descriptions of their courses contexts, so results can be better understood and generalized. We also reinforce previous claims for more longitudinal research (Martin et al., 2013) and suggest that situational judgment tests should be used as assessment measures before and after courses, so one can understand if the course actually contributes to learning.

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