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Definition and Testing of a Skills Framework to Evaluate the Effect of a Pedagogical Program in Entrepreneurship

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Our work aims at contributing to research on entrepreneurship pedagogy by designing and testing a skills framework to evaluate the outcomes of pedagogical programs in entrepreneurship. A literature review was conducted to clarify the concept of skills. The first part of this article describes the components of the 17 main entrepreneurial skills identified in the literature (both transversal and specific to entrepreneurship). A post hoc experimental plan was chosen so that the results may be replicated. Data were collected online among business students and 444 completed forms were returned. The survey instrument was tested empirically by comparing the experimental group (265 participants of an entrepreneurship seminar) with the control group (179 non-participants). Results show the value of using a complete evaluation grid when evaluating a pedagogical program in entrepreneurship. Indeed, many transversal skills may evolve positively, not just the skills that are specific to entrepreneurship.

Keywords: Entrepreneurial skills; entrepreneurship education; skills framework.

INTRODUCTION

The evaluation of entrepreneurship teaching systems has become a challenge with the significant development of entrepreneurship awareness and training actions (Duval-Couetil, 2013; Kailer, 2009). Although research in entrepreneurship pedagogy has focused on evaluation for more than a decade (Fayolle, 2008), it is still a complex subject for various reasons. One of these reasons is the diversity and uniqueness of the pedagogical contexts studied in terms of type of audiences, training contents and objectives, methods used, etc... (Fayolle, 2008). This multitude of contexts makes it difficult to compare and generalize results (Blenker *et al.*, 2014). When it comes to assessing the impact of programs and techniques, the reliability and validity of results may be called into question owing to the weakness of the sampling methodology and the absence of any experimental design (Lorz *et al.*, 2013). Moreover, the concepts used are often not clearly defined.

Entrepreneurial skills are now emerging as relevant evaluation criteria. Valuing the development of entrepreneurial skills is now a strong trend in entrepreneurship pedagogy (Morris *et al.*, 2013; Brandenburg *et al.*, 2016; Schelfhout *et al.*, 2016). This is in line with an educational sciences movement, the Competency Based Approach, which emerged in the USA in the 1970s and is now becoming more popular and established in many other domains (Gervais, 2016). It systematically integrates the evaluation of the skills acquired by learners (Gervais, 2016; Markus *et al.*, 2005). However, in entrepreneurship education literature, dedicated frameworks of entrepreneurial skills are still scarce (Gibbs, 2002; Loué and Baronet, 2012; Elmuti *et al.*, 2012).

Starting from a concrete pedagogical issue, our work aims at contributing to research on entrepreneurship pedagogy by designing and testing a skills framework to evaluate the effect of pedagogical programs in entrepreneurship. The first challenge was choosing the skills to be assessed so a literature review was conducted to clarify the concept of skills. The first part of this article describes the components of the 17 main entrepreneurial skills identified in the literature. The second challenge was to design a quantitative survey instrument. We chose a post hoc experimental plan so that the results may be replicated. Data were collected online among business students with a total of 444 completed forms (265 experimental participants and a control group of 179 non-participants). The survey instrument was tested empirically by comparing the experimental group with the control group (ANOVA with Fisher test).

Finally, the discussion places the study in the context of entrepreneurship education research and presents its limitations and strengths, particularly for the community of entrepreneurship educators.

ENTREPRENEURIAL SKILLS

Entrepreneurial skills have been a research subject for several decades. However, recently published work (Morris *et al.*, 2013; Schelfhout *et al.*, 2016) shows that a consensus has not yet been reached, at least for two reasons: the lack of a clear definition of what a skill is; and a lack of structure in the lists of skills provided by the authors.

In the present study, which is based on the most universally accepted definition of skills (Langdon and Whiteside, 2007; Draganidis and Mentzas, 2006; Kaslow *et al.*, 2009), an entrepreneurial skill is defined as a combination of knowledge, know-how/ability and know-how-to-be/attributes that an individual possesses and uses to ensure the success of an entrepreneurial project.

This definition is consistent with the difference between skills and competencies pointed out by Hoffmann *et al.* (2010). The two concepts are very similar and many articles use them interchangeably. Whereas it is difficult to distinguish them based on the European Qualifications Framework (2004), Hoffmann *et al.* (2010) include the dimensions of responsibility, autonomy and context in their definition of competency.[1]

Gibbs (2002) draws attention to the pitfalls of this multiplicity of concepts and the fact that it hampers the establishment of clear pedagogical frameworks. The definition that is eventually chosen should also help in distinguishing between these concepts and other notions that are frequently referred to when evaluating entrepreneurship training, such as traits, behaviors, motivations, attitudes, abilities, and aptitudes. For example, the definition helps distinguish between the skills and the personality traits of an entrepreneur. We thus consider that self-confidence is a trait and not a combination of knowledge, know-how and knowing-how-to-be. Although it is essential for an entrepreneur, it has no place in a skill framework. Creativity may be considered to be a personality trait when it refers to an innate characteristic of an individual, but it is also a skill that can be

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[1] *"Competence means the proven ability to autonomously recognize interrelations between facts and the contexts to which they are linked, to apply this ability to systematically develop new methods, and, if indicated, to apply them to changed situations. This includes application to work or study situations, and in professional and personal development."* (p. 642).

acquired through a combination of knowledge and know-how. As for skills, they can be taught and developed, and are not set in stone.

Professional websites, which are widely consulted by practitioners, regularly publish their own catalogues of entrepreneurial skills, such as *Forbes* ("The Top Skills Every Entrepreneur Needs") or *Entrepreneur.com* ("Five Skills That Are the Foundation of Entrepreneurial Success"). We chose not to use these lists because they are not evidence-based in the scientific sense. Instead, we selected 13 references in the entrepreneurship literature, which all offer in-depth lists of entrepreneurial skills. Considering the abovementioned definition, we did not include items relating to personality traits (for example: autonomy, acting independently, adventurism, emotional awareness, etc...) and only used skills, in accordance with the chosen definition.

When considered in the form of a referential or a list, all skills are sometimes presented as being equivalent (Applegate and Butler, 2016; Chang *et al.*, 2013). Following Chandler and Jansen (1992), we structured skills in blocks for the sake of clarity. Our analysis of the literature led us to define five blocks of skills: soft skills, managerial skills, technical skills, entrepreneurship skills and learning skills. These five blocks cover all the skills identified to date (see Table 1 and Appendix 1 for more details).

Soft Skills

We identified seven soft skills that pertain to the psychosocial field. A psychosocial skill is "*the ability of a person to respond efficiently to the demands and challenges of daily life. It is the ability of a person to maintain a state of mental well-being, by adopting an appropriate and positive behavior in their relationships with others, their own culture and environment.*" (World Health Organization, 1993).

All the articles in our database cite at least two of these skills. None of these skills takes precedence over any other, each appearing in more than half of the 13 references. We classified them according to whether they concern the individual him/herself - *Individual skills* (Creativity, Problem solving, Managing ambiguity) or his/her relationships with others - *Relational skills* (Communication, Persuasion/Negotiation, Networking, Collaboration/Teamwork).

Managerial Skills

This block is essential in that it brings together the core skills of organizational management. The Leadership/Team management and

Table 1. Entrepreneurial Skills in the Literature.

	Chandler and Jansen (1992)	Driessen and Zwart (2007)	Gibbs (2002)	Liñán (2008)	Mitchelmore and Rowley (2010)	Achcaoucaou et al. (2014)	Loué and Baronet (2012)	Chang et al. (2013)	Morris et al. (2013)	Brandenburg et al. (2016)	Applegate et al. (2016)	Schelfhout et al. (2016)	Brenet et al. (2017)
1. SOFT SKILLS													
Individual skills													
Creativity		X		X	X	X	X			X		X	
Problem solving			X	X			X	X	X	X		X	
Managing ambiguity			X	X			X		X	X	X		
Communication			X	X	X	X	X			X		X	X
Relational skills													
Persuasion/Negotiation	X		X				X	X	X	X			X
Networking	X			X		X	X	X	X	X			X
Collaboration/Teamwork			X		X	X				X	X	X	
2. MANAGERIAL SKILLS													
Defining and implementing business strategy					X	X	X		X	X			X
Leadership/Team management	X	X		X	X	X	X			X	X	X	X
Planification/Organization (of resources, operations, etc.)	X	X					X	X	X	X	X	X	X
Management of operations (financial, marketing, legal, etc.)		X	X				X	X	X		X		X
3. TECHNICAL SKILLS													
Profession based skills (general and operational)	X				X	X		X		X			
4. ENTREPRENEURSHIP SKILLS													
Detecting and defining business opportunities	X	X	X	X	X	X	X	X	X	X	X	X	X
Business Modeling/Planning						X	X	X	X				X
Business Launching			X				X	X					X
5. LEARNING SKILLS													
Collecting analyzing and using information						X		X					X
Metacognitive skills						X							

Planning/Organization skills are cited in 2/3 of the references studied. Operational management skills (cited in half of the articles) refer to the mastery of management tools that are necessary for the major functions of the company (finance, marketing, law, human resources, etc.). The defining/implementing strategy skill is also present in half of the articles.

Technical Skills

A few references (5) mention skills that are related to the field of activity (industry, catering, technology, digital, etc. . .). These are technical skills specific to each entrepreneurial project, which may explain why they are sometimes absent from the more generic skills frameworks. We chose to consider them because they characterize the context of the project and their mastery is essential to its overall performance.

Entrepreneurship Skills

The skills in the three previous blocks (soft, managerial and technical skills) can be developed in many contexts (education, employment, administration, etc. . .) that are totally independent from the world of entrepreneurship. However, they may be considered as entrepreneurial skills, provided they are used by an entrepreneur in the development of his/her project. Conversely, entrepreneurship skills are inseparable from the context of entrepreneurship. Entrepreneurship skills are specifically used in entrepreneurial contexts, such as intrapreneurship, business creation, and innovation.

The first of these specific skills is the detection of business opportunities. Knowing how to identify and exploit business opportunities is unanimously cited by the authors and is a founding paradigm of entrepreneurship research (Shane and Venkataraman, 2000). A new specific skill - business modeling/planning – has appeared since 2010, as it has become more and more essential in routine practice (Afuah and Tucci, 2000). The ability to go into business is the third skill in this block specific to entrepreneurship. All of these skills are meta-skills that draw on some of the skills from the previous blocks (e.g. planning and creativity serve business model design; problem-solving and marketing management skills serve exploiting business opportunities).

Learning Skills

This section is quite uncommon in the literature in the field of entrepreneurship as it appears in only three of the articles we consulted (Achcaoucaou *et al.*, 2014; Chang *et al.*, 2013; Brenet *et al.*, 2017). At first glance, it relates more to educational sciences and psychology (Hartman, 2001) than to entrepreneurship. However, like the previous block, learning skills are cross-cutting meta-skills that can be used in the service of managerial skills. For example, information retrieval is essential to conducting market research. These skills also refer to a portion of the entrepreneurship literature in which learning is an integral part of the entrepreneurial process (Cope, 2005).

METHOD

Operationalization of Skills Framework by Item

Table 2 presents the skills listed as items for the questionnaire. All the items begin with the phrase "*I am capable of*", which refers to the very nature of what a skill is: a combination of knowledge, know-how and knowing-how-to-be (e.g. *I am capable of implementing creative methods*). The only exception concerns technical skills, which are addressed in a very general way (*I master knowledge, know-how and knowing-how-to-be in my project's activity field*) given the variety of profiles and projects developed as part of

Table 2. Items of Skills Framework.

1. SOFT SKILLS

Individual skills

Creativity	I am capable of implementing creative methods.
Problem solving	I am capable of finding solutions when I encounter problems.
Managing ambiguity	I am capable of managing uncertain situations and taking action when faced with an unexpected situation.
Communication	I am capable of communicating information internally and externally.

Relational skills

Persuasion/Negotiation	I am capable of negotiating and convincing others.
Networking	I am capable of getting in touch with people to achieve a goal.
Collaboration/Teamwork	I am capable of working in a team.

Table 2. (*Continued*)

2. MANAGERIAL SKILLS	
Defining and implementing a business strategy	I am capable of defining a strategy for my project and implementing it.
Leadership/Team management	I am capable of leading a team.
Planification/Organization (of resources, operations, etc.)	I am capable of carrying out the organization of a project (setting objectives, planning, distributing tasks, using resources).
Management of operations (financial, marketing, legal, etc.)	I am capable of applying business management knowledge (financial, marketing, legal, etc...).
3. TECHNICAL SKILLS	
Profession-based skills (general and operational)	I master knowledge, know-how and knowing-how-to-be in the field of my project.
4. ENTREPRENEURSHIP SKILLS	
Detecting and defining business opportunities	I am capable of imagining an activity (detecting a business potential) in the environments that I encounter.
Business Modeling/Planning	I am capable of designing a business model.
Launching a business	I am capable of going further and getting into this activity (exploiting its potential).
5. LEARNING SKILLS	
Collecting, analyzing and using information	I am capable of finding information, analyzing it and using it.
Metacognitive skills	I am capable of implementing learning methods.

a pedagogical program to raise entrepreneurship awareness. Such programs are not intended to lead to the creation of businesses as such, so we chose to formulate the item relating to the launch of an activity in a general way (*I am capable of going further and getting involved in this activity* (*exploiting the potential*)). Similarly, since awareness seminars may also concern non-business students, the item relating to operational management skills encompasses all the disciplines of management sciences (*I am capable of using my knowledge in business management*).

Presentation of Pedagogical Program

Our research focuses on students participating in a pedagogical program to raise entrepreneurship awareness that has been designed and rolled out by

University of Bordeaux (France) all of its training cycles. This 20-hour educational program requires students to design innovative projects in teams. Each teacher registers the participating students for one of the training sessions scheduled during the academic year. Entrepreneurship is approached from the perspective of the Business Model they are trained to apply. To do so, the students come up with an entrepreneurial project that they have to formalize via a digital platform. This platform provides them with a dedicated, free and collaborative application which helps them think and write about their Business Model, using simple questions and examples (https://grp-lab.com/en/). Finally, the students present their project orally in teams before a jury who evaluates their projects. The following protocol seeks to measure the development of the students' entrepreneurial skills by placing them in a situation that is likely to develop these skills.

Data Collection and Analysis

The questionnaire was administered to 265 non-graduate business students who participated in one of the sessions organized over the 2019–2020 academic year. Participation was compulsory. The data collected was used to compare an experimental group with a control group to demonstrate the putative increase in skills acquired thanks to the program (Smith and Morse, 2005). The control group consisted of 179 students with identical training who did not participate in the program. A total of 444 students were interviewed (278 women and 166 men).

The data were collected online (self-administered) immediately after the students' participation in the program. Each item was assessed on a 7-point Likert scale (ranging from "strongly disagree" to "strongly agree"). The responses of the experimental group were compared to those of the control group using a one-factor analysis of variance (the factor being program participation with two modalities: having participated or not having participated) on independent samples. The results are presented in Table 3.

The results support the hypothesis that entrepreneurship education provides skills. They also show that these skills are of various types (see Table 3). All but one of the means were higher among participants in the experimental group (16 items out of 17). For nine items, the difference in means between groups was statistically significant ($p < 0.01$). Therefore, participants in the experimental group acquired a significantly higher level of skills than control participants for nine entrepreneurial skills.

Table 3. Means Comparison Test on Entrepreneurial Skills.

	MEAN		ANOVA	
SKILLS	**PARTICIPANTS**	**CONTROL GROUP**	**F**	**Sig.**
SOFT SKILLS				
Creativity	5,268	5,011	3,697	0.055
Problem solving	5,619	5,453	3,090	0.079
Managing ambiguity	5,517	5,257	6,964	**0.009***
Communication	5,736	5,480	5,237	0.023
Persuasion/Negotiation	5,649	5,246	12,980	**0.000***
Networking	5,736	5,503	3,673	0.056
Collaboration/Teamwork	5,853	5,827	0,050	0.823
MANAGERIAL SKILLS				
Defining and implementing business strategy	5,694	5,385	8,719	**0.003***
Leadership/Team management	5,555	5,369	2,427	0.120
Planification/Organization (of resources, operations, etc.)	5,642	5,525	1,143	0.286
Management of operations (financial, marketing, legal, etc.)	5,491	5,168	8,193	**0.004***
TECHNICAL SKILLS				
Profession-based skills (general and operational)	5,547	5,039	22,640	**0.000***
ENTREPRENEURSHIP SKILLS				
Detecting and defining business opportunities	5,177	4,883	5,984	0.015
Business Modeling/Planning	5,306	3,872	106,932	**0.000***
Launching business	5,045	4,458	18,378	**0.000***
LEARNING SKILLS				
Collecting analyzing and using information	5,668	5,330	11,068	**0.001***
Metacognitive skills	5,574	5,223	9,780	**0.002***

Note: *significant mean difference ($p < 0.01$)

These skills were evenly distributed between the blocks of skills in the theoretical framework. The nine skills are as follows:

— Two soft skills: Managing ambiguity and Persuasion/Negotiation
— Two managerial skills: Defining and implementing a business strategy and Management of operations (financial, marketing, legal, etc...)
— One professional skill: Profession-based skills (general and operational)

— Two entrepreneurial skills: Business Modeling/Planning, Launching a business
— Two learning skills: Collecting, analyzing and using information and Metacognitive skills.

The results were obtained by self-assessment. They indicate that thanks to entrepreneurship training, a higher level of mastery in these nine skills was achieved by participants in the experimental group than by control participants. This corroborates the participants' perceptions for five skills (Business Model Planning, Persuasion, Management of operations, Professional skill, Using information). Indeed, at the end of the course, the participants had to produce a written Business Model and present it orally to a jury, composed of teachers and professionals, in teams of 5/6 participants. They were evaluated on these deliverables. This assessment confirmed that the skill "*I am capable of developing a Business Model*" was indeed acquired and constitutes a skill development validated by the jury. While the participants were not familiar with the notion of Business Model before the training program, all of them scored average on their post-training exam. The jury also noted a high level in managerial skills (each Business Model included a market study and a projected profit and loss account), both in the ability to convince during the presentation (persuasion) and in the fact that they had learnt how to understand the sector of activity specific to their project (professional skill). All these results draw on a transversal learning skill that consists in knowing how to look for and process information (collecting, analyzing and using information).

Despite good team dynamics, the score on the item "*I am capable of working in a team*" was not significantly higher among the participants. The inter-individual variance was high and was greater than the variance between the two groups (participants vs. control group). This result may be explained by the fact that everyone reacts to teamwork in a very personal way: some people get the impression that they succeed and progress within a group while others experience difficulties with the constraints and tension that are inherent to this type of exercise. These mixed results call for reflection on how to guide teams in order to make the most of collaborative work.

DISCUSSION

Two main contributions emerge from this work. The first one is theoretical. A review of the literature on the topic of entrepreneurial skills showed that

within the concept of skills, there is in fact an overlap of concepts, some of which are more related to personality traits or motivational factors. Based on the most widely accepted definition of what a skill is, i.e. a combination of knowledge, know-how and knowing-how-to-be, we examined the literature in order to identify the entrepreneurial skills that meet this definition. First, we identified 17 entrepreneurial skills that matched the definition and divided them into five blocks of skills: soft skills (individual and relational skills), managerial skills, technical skills, entrepreneurship skills and learning skills. This article thus provides a framework for the complex and heterogeneous corpus of skills observed throughout the literature (Gibbs, 2002). This framework presents the entrepreneurial skills that must be acquired if an entrepreneurial project is to be conducted properly. Only a few of them are specific to entrepreneurial dynamics. For this reason, they were labelled entrepreneurship skills, e.g. detecting business opportunities, developing a business model and planning, launching business. They are essential for an entrepreneur to master but not sufficient by themselves. Our framework can be used in any pedagogical context to measure the development of skills in learners, as it is a general and complete tool. The framework is not specific to any educational context or setting and is suitable for any audience, be it young high school students, business or non-business students.

The second contribution is methodological. The objective of this research was to define an evaluation tool that fills the methodological gaps observed in the existing evaluation systems: difficulty in reproducing measurement protocols and weakness of the samples (Blenker *et al.*, 2014; Lorz *et al.*, 2013). Our protocol takes the form of an experimental plan. The quantitative survey instrument was tested with a control group on a sample of 444 respondents, which allows replication of the research.

In practical terms, the program for raising entrepreneurship awareness has a positive impact on the acquisition of entrepreneurship skills, such as detecting and defining business opportunities, business modeling and planning, and launching a business. For example, participants reported mastering the design of a business model at a higher level than non-participants. Results also show the value of using a complete evaluation grid, as other entrepreneurial skills also evolved positively, e.g. Persuasion/Negotiation, Management of operations. This result is all the more important in that these young students are not yet at the point where they are looking for a job, and some of them do not intend to embark on an entrepreneurial project. In this context, the pedagogical program conveys transversal skills

(e.g. Collaboration/Teamwork) that can be used in other academic or professional learning circumstances unrelated to entrepreneurship.

CONCLUSION

In the current context of higher education reform integrating the skill-based approach and the multiplication of entrepreneurship awareness schemes, our research can be used by educators. It contributes to the quality of pedagogical programs by proposing a comprehensive and operational evaluation grid of entrepreneurial skills in various contexts. Our research is in line with the EU objectives of developing entrepreneurial culture through education (Kailer, 2009). The skills grid tested and validated in this research allows to measure the effect of entrepreneurship pedagogical tools. In turn, it makes it possible to ensure that the public funding allocated by policy makers for their development is well-spent. In particular, it is relevant for detecting the impact of these measures on students still far from the job market and whose professional orientation is not yet clear. For these students, the entrepreneurial intention is an unsuitable criterion.

From a societal point of view, it is essential to enable young people to develop skills that will enable them to adapt to the uncertain world of the future. Thus, beyond training to be entrepreneurs, it can be reassuring for parents to know that the educational system allows their children to develop entrepreneurial skills, whatever the professional situations they will be confronted with.

To complete the self-evaluation of the acquisition of entrepreneurial skills by students, it would be interesting to obtain the opinions of teachers regarding the items of the framework applied in different situations. Feedback from trainers/teachers during training is essential as it is one of the determinants of the perception of skills. Indeed, although declared skills are a good indicator of learner performance, teacher evaluation would help correct any over- or under-estimation bias and thus reduce the gaps between perceived and objectively acquired skills.

Another avenue of research could be to extend the testing of this evaluation grid of entrepreneurial skills in different pedagogical contexts, e.g. with non-business students. It could also be tested in contexts other than pedagogical ones, e.g. in support structures where it would allow entrepreneurs and their coaches to point out the skills developed during the implementation of the entrepreneurial project.

APPENDIX A.

SOFT SKILLS

Individual Skills

Creativity	Creative thinking (Brandenburg *et al.*, 2016)/Creativity (Driessen and Zwart, 2007)/Creativity (Liñán, 2008)/Creativity (Schelfhout *et al.*, 2016)/Idea generation (Mitchelmore and Rowley, 2010)/Innovating (Loué and Baronet, 2012)/Innovativeness, Creativeness (Achcaoucaou *et al.*, 2014)
Problem solving	Creative Problem Solving/Imaginativeness (Morris *et al.*, 2013)/Higher-order skills related to learning and problem-solving (Chang *et al.*, 2013)/Problem solving abilities (Brandenburg *et al.*, 2016)/Problem Solving skill (Achcaoucaou *et al.*, 2011)/Problem solving skills (Liñán, 2008)/Reflection (Solves problems) (Schelfhout *et al.*, 2016)/Solving problems creatively (Gibbs, 2002)
Managing ambiguity	Change management (Achcaoucaou *et al.*, 2014)/Comfort with Uncertainty (Applegate and Butler, 2016)/Dealing with uncertainty (Brandenburg *et al.*, 2016)/Dealing with uncertainty; Flexibly responding successfully (Gibbs, 2002)/Flexibility (Driessen and Zwart, 2000)/Risk Management/Mitigation/Resilience (Morris *et al.*, 2013)
Communication	Communication (Brandenburg *et al.*, 2016)/Communication skills (Schelfhout *et al.*, 2016)/Leadership and communication skills (Liñán, 2008)/Listening (Loué and Baronet, 2012)/Presenting confidently (Gibbs, 2002)/Structuring the project communication (Brenet *et al.*, 2017)/Understanding others (Achcaoucaou *et al.*, 2014)/Written communication skills, Oral communication skills (Mitchelmore and Rowley, 2010)

Relational skills

Persuasion/ Negotiation	Convince (Brenet *et al.*, 2017)/Deal-making skills (Mitchelmore and Rowley, 2010)/Involve people with important resources; Enlist the support of key people (Chandler and Jansen, 1992)/Persuading/influencing others; Negotiating a deal (Gibbs, 2002)/Persuasiveness; Negotiation skills (Brandenburg *et al.*, 2016)/Resource Leveraging (Morris *et al.*, 2013)/Vision and Influence (Applegate and Butler, 2016)
Networking	Advisory board and networking (Chang *et al.*, 2013)/Building and Using Networks (Morris *et al.*, 2013)/Building Networks (Applegate and Butler, 2016)/Creating partnerships; Attracting investors (Loué and Baronet, 2012)/Involve people with important resources; Enlist the support of key people; Venture team with complementary competencies (Chandler and Jansen, 1992)/Networking (Brandenburg *et al.*, 2016)/Networking

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(Continued)

	skills; Making professional contacts (Liñán, 2008)/ Networking; Mobilising experts (Brenet *et al.*, 2017)
Collaboration/ Teamwork	Collaboration (Achcaoucaou *et al.*, 2014)/Collaboration (Brandenburg *et al.*, 2016)/Collaboration (Schelfhout *et al.*, 2016)/Collaboration and Team Orientation (Applegate and Butler, 2016)/Human relations skills; Interpersonal skills (Mitchelmore and Rowley, 2010)/Managing interdependence successfully (Gibbs, 2002)

MANAGERIAL SKILLS

Defining and implementing business strategy	Building a strategic vision; Conducting a strategic analysis (Brenet *et al.*, 2017)/Formulating strategies for taking advantage of opportunities; Goal setting skills; The ability to implement strategy (develop programs, budgets, procedures, evaluate performance); Development of the management system necessary for the long term functioning of the organisation (Mitchelmore and Rowley, 2010)/Guerrilla Skills; Maintain Focus yet Adapt (Morris *et al.*, 2013)/Having strategic vision (Loué and Baronet, 2012)/Strategic insight (Brandenburg *et al.*, 2016)/Strategic thinking (Achcaoucaou *et al.*, 2014)
Leadership/Management	Assembling and Motivating a Business Team (Applegate and Butler, 2016)/Delegating (Brandenburg *et al.*, 2016)/Delegating; Arousing support; Motivating; Instilling team spirit (Loué and Baronet, 2012)/Leadership (Schelfhout *et al.*, 2016)/Leadership; Management; Conflict management; Developing others (Achcaoucaou *et al.*, 2014)/Leadership and communication skills (Liñán, 2008)/Manage, Motivate (Driessen and Zwart, 2007)/Management style; Development of the organisational culture management feel is necessary to guide the firm; Delegation skills; The ability to motivate others individual and in groups (Mitchelmore and Rowley, 2010)/Organize and motivate people; Delegate effectively; Organizing and co-ordinating tasks; Supervise, influence, Lead (Chandler and Jansen, 1992)/Knowing how to organise and manage a project team (Brenet *et al.*, 2017)

(*Continued*)

Planification/Organization (of resources, operations, etc.)	Building the temporal dynamics of the project (Brenet *et al.*, 2017)/Management of Operations; Measures skills and behaviors associated with the ability to successfully manage the ongoing operations of a business (Applegate and Butler, 2016)/Maximize results in resource allocation; Organize resources; Keep organization running smoothly (Chandler and Jansen, 1992)/Operational; Supplies/Raw Materials; Office or production space; Management (Chang *et al.*, 2013)/Organizational skills; Mental ability to coordinate activities; Acquisition and development of resources required to operate the firm (Mitchelmore and Rowley, 2010)/Organising work (Loué and Baronet, 2012)/Organize –plan (Driessen and Zwart, 2007)/Planning & organising (Schelfhout *et al.*, 2016)/ Time management (Brandenburg *et al.*, 2016)
Management of operations (financial, marketing, legal, etc.)	Designing the legal engineering of the project; Defining the key points of the project's financial viability; Identifying the financing adapted to the project; Formalising the detailed financial package of the project; Conducting a market analysis/Finance and Financial Management; Sales (Applegate and Butler, 2016)/ Financial administration (Driessen and Zwart, 2007)/ Financial and budgeting skills; Marketing skills The ability to manage customers; Management skills (Mitchelmore and Rowley, 2010)/Human resources management skills; Commercial and marketing skills; Financial management skills (Loué and Baronet, 2012)/Marketing/Sales; Financial; Legal; Administrative (Chang *et al.*, 2013)

TECHNICAL SKILLS

Profession-based skills (general and operational)	Expert at the technical part of my work; Expertise in a technical or functional area (Chandler and Jansen, 1992)/Familiarity with industry; Technical skills; Industry skills (Mitchelmore and Rowley, 2010)/Office or production space; Equipment/Plant/Technology (Chang *et al.*, 2013)/Openness to technology (Brandenburg *et al.*, 2016)/Professional and technical knowledge (Achcaoucaou *et al.*, 2014)

ENTREPRENEURSHIP SKILLS

Detecting/Defining opportunities	Sensing market; Detecting opportunities (Loué and Baronet, 2012)/Environmental scanning (Chang *et al.*, 2013)/Identification and definition of a viable market niche; Development of products of services appropriate to the firms chosen; Market niche/Product innovation; Environmental scanning; Recognizing and envisioning taking advantage of opportunities; Familiarity with the market (Mitchelmore and Rowley, 2010)/Identification of Opportunities (Applegate and Butler, 2016)/Identifying goods or services people want; Perceive unmet consumer needs; Look for products that provide real benefit; Seizing high-quality business opportunities (Chandler and Jansen, 1992)/Market orientation (Driessen and Zwart, 2007)/Opportunity recognition; Opportunity assessment (Morris *et al.*, 2013)/Recognition of opportunity; Development of new products and services (Liñán, 2008)/Seeking information; Seizing opportunities (Achcaoucaou *et al.*, 2014)/Seeking opportunities (Gibbs, 2002)/Seeing opportunities (Brandenburg *et al.*, 2016)/Inform and network; Conceive and define a value proposition (Brenet *et al.*, 2017)/Taking initiatives/looking for opportunities (Schelfhout *et al.*, 2016)
Business Modeling/ Planning	Business concept (Chang *et al.*, 2013)/Conceptual competencies; Business plan preparation (Mitchelmore and Rowley, 2010)/Conveying a Compelling Vision; Value Creation (Morris *et al.*, 2013)/Defining Business Model (Brenet *et al.*, 2017)/Developing business model; Formalizing a business plan (Loué and Baronet, 2012)
Launching business	1. Carrying out the legal steps for the launching of the project; 2. Mobilizing financial resources for the launching of the project; 3. Involving partners, trainees or employees in the project; 4. Implementing the action plans; 5. Selling and carrying out a test market; 6. Managing your team; 7. Implementing communication (Brenet *et al.*, 2017)/Hiring skills (Mitchelmore and Rowley, 2010)/Making things happen (Gibbs, 2002)/Starting up a venture (Loué and Baronet, 2012)

LEARNING SKILLS

Collecting, analyzing and using information	Seeking information (Achcaoucaou *et al.*, 2014)/Get informed (Brenet *et al.*, 2017)
Metacognitive skills	Metacognitive skills (Achcaoucaou *et al.*, 2014)/ Higher-order learning (Chang *et al.*, 2013)

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