





Research Article

Entrepreneurship teaching: a study about best practices and antecedents of Brazilian teachers

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Editorial details

Double-blind review System


Article History

Received : Jun. 08, 2021
Reviewed : Apr. 10, 2022
Accepted : Sept. 26, 2022
Available online : Nov. 16, 2022

JEL Code: L23, I23, I28 e I25

Article ID: 2133

Editor-in-Chief¹ or Adjunct²:

¹ Dr. Edmundo Inácio Júnior 
Univ. Estadual de Campinas, UNICAMP

Handling Editor:

Dr. Cristiano Morini 
Univ. Estadual de Campinas, UNICAMP

Executive¹ or Assitant² Editor:

² M. BA. João Paulo Moreira Silva

Translation / Proofreading:

Gisele Zanchet Rodrigues
(Get Published)

Cite as:

Ribeiro, A. T. V. B., Ferragi, C. A., Zanotto, M. A. do C., & Cardoso, A. C. F. (2022). Entrepreneurship teaching: a study about best practices and antecedents of Brazilian teachers. *Iberoamerican Journal of Entrepreneurship and Small Business*, 11(3), Article e2133. <https://doi.org/10.14211/ibjesb.e2133>

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Abstract

Objective: to know concrete practices of teaching entrepreneurship, as well as the professional/academic background of teachers, in order to fill gaps observed in the literature on the subject. **Method:** data collection of entrepreneurship teachers recognized for their classroom practice (selected by the snowball procedure), through 10 semi-structured and in-depth interviews, examined by the content analysis technique. **Results:** identification of 30 best practices, categorized according to their emphases and respective bases, highlighted here in parentheses. They are: (a) learning (projects), (b) learning (problems), (c) reflective exercises, (d) expository (cases), (e) expository (invited entrepreneurs), and (f) expository (debates and quizzes). After detailing the activities, findings about the teachers' background were presented, in a complementary way, such as entrepreneurial experience, professional and international experiences, corroborating the existing literature on the subject. **Theoretical/methodological contributions:** by presenting boundaries, in terms of classroom approaches, the best practices contribute to the literature, as they strengthen the arguments in favor of experiential models, as well as project-based or problem-based learning. In addition, the results confirm what the literature points out in relation to the antecedents of entrepreneurship teachers **Originality/Relevance:** this study deepens the understanding of best practices in entrepreneurship education, something previously mentioned as superficial and generic (Gedeon, 2014). **Social/managerial contributions:** the results allow entrepreneurship teachers to replicate best practices within their educational settings, as the paper provides a wide range of detailed pedagogical practices that they might employ.

Keywords: Entrepreneurship education. Entrepreneurship. Teaching career. Pedagogical practices. Teacher's background.

Resumo

Objetivo: conhecer práticas concretas do ensino de empreendedorismo e os antecedentes na formação de professores, a fim de preencher lacunas observadas na literatura sobre o assunto. **Método:** coleta de dados de professores de empreendedorismo reconhecidos por sua prática em sala de aula (selecionados pelo procedimento snowball), por meio de 10 entrevistas semiestruturadas e em profundidade, examinadas pela técnica de análise de conteúdo. **Resultados:** identificação de 30 boas práticas, categorizadas conforme suas ênfases e as respectivas bases, destacadas aqui entre parênteses. São elas: (a) aprendizagem (projetos), (b) aprendizagem (problemas), (c) exercícios reflexivos, (d) expositiva (casos), (e) expositiva (empreendedores convidados), e (f) expositiva (debates e quizzes). Após o detalhamento das atividades, foram apresentadas, de forma complementar, descobertas sobre os antecedentes dos professores, como a vivência empreendedora, as experiências profissional e internacional, corroborando a literatura existente acerca do tema. **Contribuições teóricas/metodológicas:** por apresentar fronteiras, em termos das abordagens em sala de aula, as boas práticas contribuem para a literatura, pois fortalecem os argumentos favoráveis aos modelos vivenciais, e aos baseados em projetos ou problemas. Além disso, os resultados confirmam o que aponta a literatura em relação aos antecedentes na formação de professores de empreendedorismo. **Originalidade:** este artigo apresenta uma análise aprofundada sobre boas práticas no ensino de empreendedorismo, algo antes apontado de modo superficial e genérico (Gedeon, 2014). **Contribuições sociais/para a gestão:** os resultados permitem a apropriação e a replicação, em outros contextos, por parte de professores de empreendedorismo, do amplo espectro das práticas aqui elencadas.

Palavras-chave: Ensino de empreendedorismo. Empreendedorismo. Carreira docente. Práticas pedagógicas. Antecedentes da formação de professores.

INTRODUCTION

Entrepreneurship education has been an emerging theme, with considerable growth in publications, as well as in its practice, due to the many courses and programs created (Nabi et al., 2017). This prominence is a natural consequence of two agendas that preceded it: the understanding that entrepreneurship contributes to the economic development of nations (Bosma et al., 2018; Breznitz & Zhang, 2020; Urbano et al., 2019); and the understanding that educational institutions are fundamental agents for prosperous environments for the creation of new companies (Bin et al., 2018; Guerrero et al., 2016; Wright et al., 2017). The literature then advanced, given the conclusion that entrepreneurship education collaborates to the growth of the economy (Nabi & Liñán, 2011).

Despite the increased interest in the subject, there is criticism of research on interventions in entrepreneurship education, due to the contradictory results presented (Martin et al., 2013; Weaver et al., 2006), which are sometimes positive, sometimes negative. The nature of research in social sciences, which involves a complexity of variables, may justify these opinions given the impossibility of having laboratory environments capable of controlling the results.

The contradictions and weaknesses identified in research on entrepreneurship education are seen, for example, in the study of Martin et al. (2013), whose result was affected by the teachers' performance in the classroom; and Morris et al. (2017), in which previous professional experience was the variable highlighted in the analysis of training interventions in entrepreneurship at undergraduate level. That is, different teachers, with different levels of preparation for the educational practice, can generate different results, even under similar interventions.

Focusing on positive teaching practices on the subject, Mandel and Noyes (2016) found them in the 25 main American universities, also raising with the managers of the institutions, learnings regarding their implementation. The same occurred in Finland, with Ruskovaara and Pihkala (2013), resulting in the identification of best practices among 521 teachers and other people involved in the teaching of entrepreneurship. In Brazil, Rocha and Freitas (2014) collected and analyzed data from a questionnaire with 407 business students; and Silva and Patrus (2017) carried out a bibliographic survey of best practices published between the years of 2005 and 2015.

Despite this, as Gedeon (2014) reinforces, many studies on entrepreneurship education still provide abstract recommendations, even at a high level, without specific recommendations and not presenting exactly what should be carried out in the teaching program. Solomon (2007), Ruskovaara and Pihkala (2013) and Fiet (2001), for example, highlight difficulties on the part of teachers in finding adequate teaching content and methods. This limitation is in line with the demand for well-established research agendas in academia, such as those of Guerrero et al. (2016) and Dominik e Banerji (2018), who highlight the need for articles presenting concrete actions carried out in terms of entrepreneurship in universities.

That said, the questions that guide the present research are as follows: Among the best practices being implemented in the classroom for entrepreneurship education, what specific actions stand out from the educators' point of view? And who are these educators?

The general objective of the present article, therefore, is to present concrete and detailed activities considered as best practices in entrepreneurship education in Brazil. In addition, we seek to understand the career background of educators involved in these practices.

For that, 10 in-depth interviews were carried out and the results detail practices with approaches in project-based learning, experiential teaching, flipped classroom, simulations, and games, among others; and the background of the trajectory of educators, such as their professional, entrepreneurial, and international experiences.

As contributions, the present study (a) highlights practices that can be appropriated by entrepreneurship teachers in their day to day work in the most diverse contexts; (b) can help higher education managers to implement these practices in a transversal way in their institutions and to identify favorable backgrounds in the teaching trajectory, especially in decision-making process for hiring and in the elaboration of the career plan involving these professionals; and (c) complements the literature on the subject regarding the understanding of these practices in the classroom, based on concrete actions that encourage entrepreneurship, as well as presenting materials to improve the analysis of the background in the training of entrepreneurship teachers.

The present article is organized as follows: the present introduction; theoretical framework, which covers the emergence of the theme "entrepreneurship teaching and best practices" already published on the subject; research methods; results of the interviews and the discussions generated from them; and, finally, the final considerations of the study.

THEORETICAL FRAMEWORK

Entrepreneurship teaching: the maturation of literature and its new frontiers

The theme of "entrepreneurship education" has had considerable growth in recent decades (Alves et al., 2019; Urbano et al., 2017), initiated by the increase in the volume of publications, courses, and programs, (Nabi et al., 2017), from which more consistent lines of research have emerged in the literature.

Ribeiro and Plonski (2020), for example, point out nine thematic groupings in the articles with the highest score of relevance: (1) intention and self-efficacy; (2) learning processes; (3) critical essays; (4) systematic literature reviews; (5) best practices in the classroom; (6) gender studies; (7) opportunity recognition optics; (8) social business context; and (9) competency-based vision.

To Martin et al. (2013), the expected result of interventions in entrepreneurship teaching involves the development of competencies (knowledge, skills, and attitudes), the recognition of opportunities and decision-making in the face of uncertainty, and navigation through the processes of creating a new business. Rasmussen and Wright (2015), also add other skills, such as knowing how to deal with risk and incomplete information, attracting resources, business modeling, and leading teams.

In general, there seems to be a consensus that entrepreneurship education should cover topics such as: development of self-efficacy (Oosterbeek et al., 2010 resource attraction and management (Lin & Nabergoj, 2014); opportunity recognition (Shane & Venkataraman, 2000); risk tolerance (Kerr et al., 2017); and people leadership (Rasmussen & Wright, 2015).

Although several purposes for courses and programs have been designed, Lackéus (2016) and his predecessors (Cooper et al., 2004; Hannon, 2006) highlight that they depend on what is expected with the proposed format, that is, a program can be about entrepreneurship (theoretical discussions about the phenomenon and its impacts); for entrepreneurship (aiming for the development of practical skills); or through entrepreneurship (a concrete experience to obtain a foundation for the learning process).

In a systematic review of the literature, Nabi et al. (2017) found two main lines: (1) that of personal change—in 51% of the articles this was the intention to create a business — and attitudes towards entrepreneurship, i.e., the search to develop specific skills, with the perception that entrepreneurship is something feasible; and (2) that of generating business, such as the creation of a startup or a social enterprise; and the improvement of the performance and socio-economic impact of the business.

Although the production of articles on entrepreneurship education has been extensive in recent years, criticism of some of these articles has also emerged—a common fact in the face of scientific progress, regardless of the topic. One of the criticisms involves the studies on the intention to create a business, given the possibility that it is influenced by variables such as self-selection bias, where the greatest predictor of future intention is prior to the educational experience (Fayolle & Gailly, 2015). Another criticism is the absence of robust experiment designs in most studies on entrepreneurship education, something which could minimize the fragility to common biases, as highlighted by Martin et al. (2013) and Rideout and Gray (2013). Finally, other criticism deals with the contradictions in the results, with some studies highlighting the positive effects of programs, while others do the exact opposite (Weaver et al., 2006; Martin et al., 2013).

The literature also advances by addressing research opportunities evidenced in other studies (Fayolle, 2013; Fellnhofner, 2019; Lopes & Lima, 2019) on entrepreneurship teaching. Among them, there are (a) the need to observe dynamics of training entrepreneurs at undergraduate level in environments outside the classroom or in institutional spaces (Etzkowitz, 2013; Ribeiro & Plonski, 2020); (b) the lack of studies with concrete and specific actions on entrepreneurship support and teaching in universities (Gedeon, 2014; Guerrero et al., 2016) and (c) the examination of demographic effects on outcomes of educational interventions for entrepreneurship, such as gender or regional differences (Lopes & Lima, 2019; Westhead & Solesvik, 2016).

Best practices in entrepreneurship teaching

In the discussion about the best model for entrepreneurship teaching at undergraduate level, several authors argue in favor of using experiential models, with concrete experiences, practical activities, and contact with the market or with real case studies (Fayolle & Gailly, 2015; Hägg & Gabrielsson, 2019; McNally et al., 2018; Nabi et al., 2017; Noyes, 2018).

According to the classic works of Kolb's experiential theory (2014), experiential learning is understood as the processes that go through four phases of the Kolb cycle: concrete experience; reflective observation; abstract conceptualization from the experience; and the active implementation of experiments around the concepts, which leads to the beginning of a new cycle of experimentation.

According to Cooper et al. (2004), this pedagogical approach is aligned with constructionist precepts, developed by theorists such as Dewey and Lewin, and derivatives of Piaget's findings and theory, oriented to the concrete experience of meaningful and motivating learning, which can be applied in the teaching of entrepreneurship. In this approach, the student is placed in experiences through which he can "see, feel, and touch" (Cooper et al., 2004, p. 11).

In a review of best practices in entrepreneurship teaching, Taatila (2010) presents various interventions based on experiential learning. In one of them, at the Nanyang Technopreneurship Centre in Singapore, the training takes place after university graduation, aiming to insert students into the labor market after a four-month program, with visits to international regions and classes taught by local experts (entrepreneurs, investors, and lawyers). By the end of the period, students are expected to have developed plans for new technology-based companies.

In another case, at the Laurea University of Applied Sciences in Finland, students undergo immersions for the creation of real business, under the expert mentoring and support of colleagues. Also in this country, at the Haaga-Helia University of Applied Sciences, as well as at the University of Tasmania, Australia, the educational approach does not have the participation of teachers, and the courses are student-led, oriented to the creation of companies from hobbies and personal passions, with the premise that an educational intervention becomes more effective when it stimulates intrinsic motivations. This look at personal interests and motivations can find its roots in proposals such as the effectuation (Hannon, 2018; Lopes & Lima, 2019; Sarasvathy, 2001).

In addition to traditional lectures, with passive engagement in terms of learning, Cooper et al. (2004) highlight other pedagogical approaches with active participation, progressively organized, and that benefit from this engagement: case studies; readings and videos; exhibition sessions (with the presence of entrepreneurs); guided visits to companies; and projects aimed toward these companies.

From this perspective of the dichotomy between passive and active learning, Silva and Patrus (2017) highlight as passive methods and practices the exhibition classes, case studies, and seminars or lectures with entrepreneurs; and as active methods and practices, visits to companies, business plans, experience in business incubators, business games or simulations, experience in student-led junior enterprises, and the realization of research and extension projects.

In another review of pedagogical interventions for entrepreneurship teaching, Rocha and Freitas (2014) list the following methods, techniques, and resources: lectures, visits and contact with companies, business plan, case studies, theoretical group work, practical group work, discussion groups, brainstorming, seminars and lectures with entrepreneurs, business creation, application of essay-based writing tests (in order to reinforce theoretical knowledge and written communication), individualized attention, individual theoretical works, individual practical works, product creation, films and videos, company games and simulations, suggestion of readings, incubators, and business plan competitions. This continuum between active and passive interventions can also be found in previous discussions about experiential learning, such as those promoted by Furman and Sibthorp (2013) and Gentry (1990).

Another pedagogical approach is the design-led approach, based on design processes to transfer knowledge to students. It is commonly used in disciplines oriented to product development (Linton & Klinton, 2019; Zancul et al., 2017). Huq and Gilbert (2017), present an entrepreneurship teaching program in Australia through which students became more participative in classes, where the design-led process is oriented to the discovery of a solution, with the emphasis on understanding the problem and contacting users.

In another case, Linton and Klinton (2019) present an entrepreneurship program with steps inspired by Design Thinking: formation of heterogeneous teams; presentation of complex problems; understanding the context of the problem, translating it into concrete needs of a persona; ideation of solutions; prototyping of solutions; and decision on a final solution, presented to an audience.

In short, it is understood that pedagogical practices for entrepreneurship teaching, in addition to the development of knowledge, skills, and attitudes, should touch on aspects related to real engagement for the creation of new businesses—which is presented in studies on entrepreneurial intention (Bae et al., 2014; Karimi et al., 2016; Maresch et al., 2016; Nabi et al., 2018).

Based on the studies of the theory of planned behavior and self-efficacy (Ajzen, 2020; Bandura, 1977; Gorgievski et al., 2018), it is understood that, as pointed out by Celuch et al. (2017), the entrepreneurial intention is born from factors such as career desirability ("I want to undertake") and viability ("I feel capable of undertaking"), implying the need for efforts in the classroom focused on the fields of individual development and self-knowledge.

The figure of the educator and his background in entrepreneurship

Complementary to the broad exploration of classroom practices, Martin et al. (2013) argue that the variability of results, often contradictory in pedagogical approaches, may be a consequence of the performance of the teachers and not necessarily the result of the approach itself.

In the case presented by Huq and Gilbert (2017), for example, a considerable part of the praise related to the new approach was linked to the competence, passion, or openness of the teaching staff in supporting students. Understanding the figure of the teacher as a facilitator of learning processes, previous experiences, especially entrepreneurial ones, present themselves as a differentiator. Thus, there should be an understanding of both the concrete approaches implemented in the classroom and the trajectory of the teachers who used them.

Although the figure of the educator is characterized as central in several processes of the entrepreneurship teaching, research on the subject is still scarce (Dominik & Banerji, 2018; Fayolle, 2013; Hannon, 2018; Ilonen, 2021; Neck & Corbett, 2018). In order to support future studies on the analysis of the teachers and their backgrounds, Hannon (2018) and Fayolle (2013) highlight the role of "who" in a teaching program, dealing not only with who the student is, but also who the educator is.

When addressing the figure of educators in entrepreneurship, several questions emerge, for example, from the works of Fayolle (2013) and Hannon (2018). They are: Who is

the educator in entrepreneurship? What does it mean to be that figure? What is the background in their training? How is the duality between practical and academic experiences?

When looking only at previous experiences (background) in teacher training, the following factors were taken from the literature: international experience (Chen et al., 2013; Dal-Soto et al., 2021; Zhou & Xu, 2012); experience as a founder of companies (Diegoli et al., 2018; Ferrandiz et al., 2018; Hannon, 2018); the construction of a diverse network of contacts, including academics and market people (Hannon, 2018); and acting as a company manager (Hannon, 2018).

Thus, in addition to the background in the formation of the educator in entrepreneurship, other personal influences are equally relevant such as their perception of entrepreneurship, local culture, area of activity, people-reference, and work environment (Henry, 2020).

METHODS

In order to answer the guiding questions of the present research, it was necessary to identify: (a) the actions implemented by entrepreneurship teachers in their curricular activities (primary objective); (b) the main theoretical approaches used by teachers in their specific practices, and (c) the patterns of their career trajectories, in order to better understand the role of specific experiences in their training (secondary objectives).

Following the categorization proposed by Ikeda (2009), the present research adopts an interpretivist approach, with an inductive process, characterized by exploratory and qualitative nature. Data collection took place through in-depth interviews with 10 entrepreneurship teachers, chosen by the "snowball" method, which was adopted due to the interest in having specific and renowned teachers in the area in the sample. Because of this, the sample was categorized as "hard to find" (Atkinson & Flint, 2001).

The procedure for obtaining the sample was through the present authors' personal network; request for recommendation in professional social networks; and, at the end, by the in-depth interviews themselves. The interviews lasted 60 minutes on average and were mostly recorded. When recording was not possible, due to limitations of the available tools, detailed notes were made on the occasion.

As suggested by (2016, p. 264), the use of in-depth interviews aims to "highlight the constants, regularities, and (...) access to the way of thinking and acting of social figures and highlight the social processes underlying their practices", allowing the judicious extraction of good practices, as well as the understanding of their personal trajectories.

Furthermore, the data examination procedures were based on content analysis (Caregnato & Mutti, 2006), qualitatively structured, through the categorization of patterns identified in the answers. The interviews had a protocol organized in two blocks, based on the literature review (teacher's trajectory and pedagogical practices), resulting in 14 questions addressed in a semi-structured manner (Table 1).

The interviews were implemented with open-ended questions, in order to minimize the social desirability bias of self-reporting (Edwards, 1953), without the presentation of examples by the interviewees that could generate similar reports. It is worth

noting that the categorization and interpretation of the results were anchored by the reviewed literature.

Table 1

Alignment between the question block and the analyzed literature

Literature	Questions
Background in the training of entrepreneurship teachers (Chen et al., 2013; Dal-Soto et al., 2021; Diegoli et al., 2018; Ferrandiz et al., 2018; Hannon, 2018). International experience; experience as a founder of companies; building a diverse network of contacts, including academics and people from the market; and experience as a business manager.	1. Tell me about your life trajectory. 2. During your life, what were the most significant experiences in entrepreneurship? 3. During your life, what were the role models in entrepreneurship for you? 4. How does your journey reflect on your pedagogical practice (activities, content, experiences, etc.)? 5. When did you decide to become a teacher? And why?
Approaches in teaching entrepreneurship (Furman & Sibthorp, 2013; Silva & Patrus, 2017): problem-based learning (problem solving based on case studies, simulations, etc.); project-based learning (with application of knowledge to materialize projects); peer-based learning (made from the relationship between peers, as in debates); service-based learning (engaging with the community); reflective learning (with personal reflection exercises); expository classes; case studies; seminars or lectures with entrepreneurs.	6. Tell me about the syllabus of your course linked to entrepreneurship/innovation. 7. How did you get to this program? What did you think when designing it? 8. How do you think students best learn entrepreneurship? How is this belief reflected in your practice? 9. Tell me about a specific teaching practice (a particular class or activity) that you are most proud of. 10. How did you arrive at this practice? What did you think when designing it? 11. What competence do you seek to develop in this practice, specifically? 12. How do you keep up with entrepreneurship advances and best practices? 13. What would you change or implement in your practice? 14. What other activities exist to foster entrepreneurship in your institution?

Note: Elaborated by the authors

Finally, to obtain greater variability and diversity in the sample of respondents (Table 2), teachers with different profiles and those working in different departments were selected. Therefore, theoretical saturation was not expected in the interviews, in order to privilege breadth over depth.

PRESENTATION AND DISCUSSION OF RESULTS

Based on the concepts presented in the literature review, the present section is divided into two parts: (1) pedagogical approaches and specific curricular practices identified; and (2) individual trajectories of entrepreneurship teachers.

Pedagogical approaches and specific curricular practices

After the interviews were carried out, the data related to pedagogical practices were categorized in order to identify patterns and groupings, based on the pillars of experiential learning proposed by Gentry (1990). Therefore, for the analysis of a continuum between active and passive approaches, the following pillars were considered: degree of participation; degree of interaction with external agents; coverage of cognitive, behavioral, and affective aspects; and variability and unpredictability.

Table 2

Profile of survey respondents

Interviewed	Role (at the time of the interview)	Educational background
Interviewed 1	Associate Professor at the Department of Information Systems (USP São Carlos)	Bachelor's Degree in Electrical Engineering (UFRS), Master in Computer Science (UFRS), PhD in Electronic Engineering (University of Kent, Canterbury).
Interviewed 2	Professor at UNIFACCAMP and FATEC.	Bachelor's Degree in Communication (PUC/RJ), Master's and Ph.D. in Business Administration (USP), Post-Doctorate in Entrepreneurship Education (USP).
Interviewed 3	Seasonal lecturer at the Escola Superior Dom Helder Câmara.	Bachelor's Degree in Production Engineering (UFMG and New Mexico State University), MBA in Strategic Business Management (PUC/MG).
Interviewed 4	Associate Professor at the Department of Production Engineering (USP).	Bachelor's Degree in Mechanical Engineering (USP), Master's and Ph.D. in Production Engineering (USP), Visiting Scholar in Education (Stanford).
Interviewed 5	Full Professor at the Chemistry Department (UFMG).	Bachelor's Degree and Masters in Chemistry (Unicamp), Specialization in Chemistry (Gifu University), Ph.D. in Inorganic Chemistry (Oxford), Post-Doctorate in Technological Entrepreneurship (HEC).
Interviewed 6	Vice-President at Brazilian Association of Studies in Entrepreneurship and Small Business Management. Former Professor at ESPM.	Bachelor's Degree in Psychology (UFRJ), Specialization in Marketing (ESPM), Master in Counseling Psychology (Lesley College Graduate School), Masters' and Ph.D. in Social Psychology (USP).
Interviewed 7	Professor at the School of Architecture and Urbanism (Mackenzie University).	Bachelor's Degree in Industrial Design (Mackenzie), Master in Education, Art and Cultural History (Mackenzie), and PhD in Architecture and Urbanism (Mackenzie).
Interviewed 8	Professor at the Department of Management (Centro Universitário FEI).	Bachelor's Degree in Economics (USP) and Master in Entrepreneurship (USP).
Interviewed 9	Professor at the Center of Engineering, Modeling and Applied Social Sciences (UFABC)	Bachelor's Degree in Accounting (UFCE), Specialization in Marketing Management (UFCE), Specialization in Business and Project Management (Fundação Dom Cabral), Master's and Ph.D. in Business Administration (USP).
Interviewed 10	Co-founder of Baita Aceleradora. Former seasonal lecturer at Unicamp and professor at UFBA.	Bachelor's Degree in Computer Sciences (Unicamp).

Note: Elaborated by the authors.

¹ Occupied the Presidency chair until July, 2020.

The codes that emerged from this assessment, as proposed by Furman and Sibthorp (2013), were aligned with the following learning: (a) problem-based, whose resolution is based on case studies, simulations, etc.; (b) project-based, through the application of knowledge for its materialization; (c) peer-based, arising from peer relationships, such as in debates; (d) service-based, such as engagement with the community; and (e) reflective, with exercises of personal reflection.

In addition, the codes associated with practices of more passive spectra of learning, such as lectures, teaching cases, and seminars or lectures with entrepreneurs, according to Silva and Patrus (2017), were adapted to more active practices.

More important than the terminology, when defining the location in the spectrum of active and passive models, is the configuration, which depends on the concrete applications of the practices. The use of practice based on cases, for example depending on the way in which it is applied, can be more active, with greater proximity to cases and more concrete experiences of decision-making dilemmas; or more passive, with the exposition of the case and discussions with a lower degree of engagement. Thus, it is common to encounter contradictory situations, such as of the case studies, treated as active by Furman and Sibthorp (2013) and passive in the view of Silva and Patrus (2017).

After the coding of the interviews, six categories and 30 practices were observed, with emphasis on project-based learning (12); problem-based learning (eight); reflective exercises (four); expository, based on cases (two); expository, based on invited entrepreneurs (two); and expository, based on debates and quizzes (two). Below is a breakdown of the specific activities for each category.

Practices with an emphasis on project-based learning

Among the 12 practices with project-based learning, the following patterns in the formats of the interventions were identified. The projects are (a) oriented towards generating impact, with the construction of solutions for needy communities, NGOs or regional social improvement (four); (b) creation of startups, starting with ideation, proceeding to prototyping, and, subsequently, pitching to specialists or investors (three); (c) arising from demands from real companies to solve problems (two); (d) construction of solutions based on existing technologies, generated in scientific initiations, for example, or portfolios of patents/technologies not yet used (two); and (e) short-term, for creating solutions at inspirational events, such as startup weekends and similar (one).

It is understood that impact-oriented projects align with the proposition of Furman and Sibthorp (2013), that, in service-based learning, there is a gain in the engagement of students involved in challenges with real social impacts, which was highlighted by the interviewees. For example, in one of the practices, students in the chemistry course were provoked to rethink the lunch boxes of a prison (materials, format, and handling), going through the product development process throughout the semester (visits to the prison, on-site interviews, and other activities).

In two other approaches in this same field, the process, also based on product development steps, provoked undergraduate students in the computer science program to rethink hospital equipment; and in the design program, to design furniture for a needy community. Both had support from the companies, with emphasis on the students of the design course, assisted by a company producing bespoke furniture, with the furniture subsequently donated to the community.

In approaches focused on the creation of startups, in turn, the autonomy offered to students in thinking about new business helped in motivation and promoted meaningful learning. In this

context, in one of the cases, the scope was limited to create a startup in the field of e-commerce in order to promote complete experiences, in terms of prototyping and execution with real customers. In another, the dissertation work in the entrepreneurship course allowed students throughout the two semesters normally dedicated to the dissertation to replace the production of the academic text by building their own startup, as long as the entire process of implementing the business was recorded and followed the approaches of design thinking, lean startup, customer development, business model canvas, and blue ocean, among others.

Similar to the processes of the aforementioned discipline is the pattern of projects in inspirational events, which have similar steps and tools, but are a short experience typically lasting a few days. The interviews pointed to the same processes, such as the stages of customer development (Blank, 2005), in the two interventions based on existing technologies.

Project-based disciplines involving companies also reap the benefits of student engagement, due to contact with real agents (Hägg & Gabrielsson, 2019; Noyes, 2018). The interviewees showed great care with the previous alignment with companies (definition of the scope of the project and expectations of the results), in order to avoid disappointments for both the students and the company. In this way, a commitment to the companies is established, with the possibility of sponsoring the prototypes, participation of executives in specific moments of the discipline, and visits to the companies. One of the interviewees indicated the use of pilot support sessions from companies for the students (instead of a project throughout the semester, a class with representatives from the company leading an activity) to encourage the engagement of companies, especially when they were less willing to participate.

Practices with an emphasis on problem-based learning

Among the practices with problem-based learning (eight), the following patterns in the formats of the interventions were found: (a) solving problems of diverse organizations; (b) identifying new opportunities based on challenges and specific contexts; and (c) meeting challenges related to attraction and resource management.

In solving problems of diverse organizations, the developments resemble those identified in project-based approaches, that is, relationships with companies, community support, and generation of new businesses, or operation with new businesses. In problem-based interventions, however, the challenges were more concise, unlike those involving projects, since, in addition to lasting the entire discipline, they generally constituted shorter and less connected interventions. An exception to this was found in only one case, in which the problem was more complex: a telecommunications company brought the challenge of launching a product, and the students, in groups, had the entire semester to understand the situation and propose a product launch plan.

At this point, it is worth considering the distinction between problem-based learning versus project-based learning: although the pedagogical approach can be classified as problem-solving learning, depending on the complexity presented and the processes involved, the pedagogical approach can be

characterized as project-based learning, as highlighted by Mills and Treagust (2003). Although the fine line between the two formats was evident, the categorization was based on the definition given by the interviewee.

In two other practices, attention to service-based learning unfolded in solving (a) problems of a classmate who was undertaking entrepreneurship, and (b) specific problems of an NGO located in the surroundings of the educational institution.

The fourth practice in the field of solving organizational challenges focused on a startup, which with the use of multimedia resources, created a realistic exercise which closely replicated the professional context. In each class, an entrepreneur sent two audios: one presenting a problem within the startup on a certain subject of the class (presented at the beginning of the class and with time set for students to solve it); and another audio with the solution implemented by the startup, presented at the end of the class. In addition to the motivation linked to the challenge, these practices show real problems that need to be solved—a factor that deepens students' meaningful learning.

Furthermore, according to the problem-based learning model by Schmidt et al. (2011), experience in solving problems activates the interest in learning, because the problem is real and calls for discussions to elaborate proposed solutions. Thus, with new knowledge, the proposition of solutions is refined, identifying gaps in past knowledge and achieving better levels of learning.

In problem-solving practices aimed at identifying opportunities in specific contexts, two practices were mentioned in the interviews. In one of them, there is the use of the course syllabus to think about business challenges and solutions, such as the applications of a new polymer in industry. Structured as seminars, each class brings some technological advance, which should lead students to identify challenges and how certain technology could be applied in this context. The second exercise comprises the identification of opportunities through the reading of materials in magazines brought by the students themselves to the classroom, followed by identifying and presenting business opportunities based on such materials. At the end of the exercise, one of the ideas is selected and the class divided into two parts: half to defend the idea, and half to refute it. In this way, it delves into the complexity of an opportunity and the variables that involve more risks for a given business.

Finally, the challenges of attraction and resource management are presented to students. In one of the practices, the challenge is, in a simulated environment, to produce a loaf of bread, negotiate with suppliers and present data on the economy and business creation. Another technique or practice, inspired by a technique implemented in universities such as Stanford in the USA (Seelig, 2009), groups of students receive a financial amount, with the challenge of multiplying it throughout the academic semester. The group that achieves the highest return wins, and in the example given by the interviewed teacher, this group would receive 30% of the total profits of all the other groups together. It is worth highlighting that although such an intervention has been modeled throughout the semester, it is an approach capable of being carried out in shorter periods, such as one or two weeks.

Other approaches

Of the 30 best practices or techniques identified, 10 are grouped into four themes, with a lower volume of records, as pointed out at the beginning of the chapter. Thus, the practices are distinguished (a) based on reflective exercises; (b) based on cases; (c) involving invited entrepreneurs; and (d) based on debates and quizzes.

In reflexive exercises, reflection is based on self-assessment, such as the use of tests including the Big Five, Myers-Briggs, and DISC with animal metaphors. Similar and free versions are offered at: viacharacter.org, 16personalities.com/br/ e personalidades.mobi.

Also characterized as a reflexive approach, there is the activity of shadowing with entrepreneurs, which consists of pre-arranged visits to the company, where the student follows the daily actions of the entrepreneur to understand their routines, dynamics, and skills. The activity is usually concluded with reflection exercises about the entrepreneur and the student who accompanied him.

It is noteworthy that the use of case studies, as well as inviting entrepreneurs to speak, in addition to presenting trajectories and attention to specific behaviors, allows self-identification of students with the same interests and capabilities presented by entrepreneurs, awakening greater confidence in creating a business.

Approaches that use debates or quizzes seek to add a gamification element, such as the use of points and ranking of the best, can be mediated by tools such as Menti or Kahoot, provoking answers to difficult and interesting topics.

In one technique, the teacher brings the story of startups characterized as unicorns (market value equal to or above U\$1 billion) and a series of questions: How many rounds of investment were needed? How long did it take to reach that level? What was the profile of the founding team? Which investment funds were involved, and how were the investments made? How fast is the team growing? From these questions, new debates were formed about the necessary skills.

Individual trajectories

For the categorization of individual trajectories, in the 10 interviewees, three types of experiences which correspond with the existing literature on the subject were observed: those who created a business (six individuals, five of which were successful, as the company continued in operation or was acquired by a large business group); corporate professionals (four, all in large companies and with strategic positions); and international experiences (six, which considered it the central element for the change of mentality in relation to entrepreneurship at the university).

Still regarding international experiences, the importance of their role in creating a new perspective for the entrepreneurship education at the university was perceived. In some cases, respondents highlighted the impact of these international experiences on their mentality when taking the lead as an inventor and entrepreneur, with their peers, including mentors and experts, reinforcing the idea of building their own solutions, and undertaking from them.

The contact with experts in the subject (an advisor who is a reference in the entrepreneurship theme) and the experience in renowned institutions in entrepreneurship education, such as Babson College, were pointed out as essential for the creation of new perspectives.

In other cases, the perception of positive collaboration with the market translated into a change in behavior regarding the relationship with the industry, as well as the creation of specific practices in their business. In one of the interviews, a professor, who today brings industry challenges to be solved in the classroom, pointed out that he incorporated the technique during his years of collaboration with the University of Firenze, in Italy: "I saw how close the university was to the furniture industry, and how this industry turned to the University, researchers, and students to solve its problems."

As for professional experiences, the reports indicate, as a result, a better understanding of the processes of creating companies, developing new products, management, and customer relationships. "Speaking with propriety", highlighted by an interviewee, guarantees the presentation of the topics to the students based on the practice experienced, in addition to illustrating with real examples, for concrete understanding.

In addition, the practical experience was pointed out as beneficial, due to the contact with updated tools and processes. In one of the interviews, the teacher mentioned that a student was hired by one of the startups, after telling the interviewee that, throughout the discipline, he used tools such as GitHub (dominant programming resource) and management processes based on Scrum methodology (agile product management approach, dominant among startups).

Finally, the professional experience seems to be connected to the participation of invited entrepreneurs and partner companies in the disciplines. Examples of this are an interviewed professor, who has a long career in the Telecom sector and taught a discipline with challenges from Oracle (a company with which she had a close relationship); and the repetition of this pattern, explicitly, in the other four interviews conducted. Thus, it is understood that although large corporations may have limitations regarding the nature of the work (being considered, sometimes, not very entrepreneurial), the network of contacts developed, as well as the knowledge of modern tools and practices, may make the difference in the formulation of innovative experiences. In addition, it can be highlighted that these experiences denote part of the professional's career dedicated to innovation and the development of new products, areas whose nature is more entrepreneurial.

In short, unlike teachers who develop a purely academic career, without connection with any practical experience, the background and previous experiences of those who have lived it may indicate a not so trivial trajectory in entrepreneurship education. Thus, while there is a tendency for fragmentation and specialization of knowledge on the part of some educators, the individual trajectories of the interviewees are enriched by international experiences, social projects, and experiences of success and failure in various activities, especially the opening and shutting down of companies.

Thus, in addition to the corporate professional experiences, all the professional experiences are relevant to the entrepreneurial attitude of these teachers. In addition to them are

their contact networks, insertion in entrepreneurial ecosystems, and even initiatives to follow studies and trends on entrepreneurship education. This arrangement between teaching and entrepreneurial practice, to some extent similar to the design of the learning process and research, guarantees, according to the interviews, greater inspiration, critical vision of the subject taught, and integration of theoretical knowledge to previous experience.

CONCLUSION AND CONTRIBUTIONS

By presenting, in detail, 30 best practices of entrepreneurship teachers, recognized for their pedagogical practice, this work advances the literature by meeting the demand for details regarding classroom activities aimed at entrepreneurship teaching (Gedeon, 2014; Guerrero et al., 2016), reinforcing the emergence of the main approaches being used in classes. The following (Table 3), is a summary of the findings in relation to the practices mentioned here.

Of the 30 practices, 10 correspond to a more passive learning spectrum; despite this, they add considerable elements of contact with reality, such as self-knowledge exercises, real cases study, and the participation of invited entrepreneurs—which connects with the approaches presented by Silva and Patrus (2017).

Table 3

Summary of identified best practices and their pedagogical approaches

Pedagogical approach	Identified best practices
Lecture, based on the presentation of cases	Social business cases and business models; cases of startup entrepreneurs and their skills.
Lecture with entrepreneur guests	Lectures and panels with entrepreneurs.
Lecture, based on peer activities	Quizzes with competition among colleagues; debates among the class about trajectories of startup entrepreneurs.
Project-based learning	Turning inventions brought by guest companies or students (from research internships) into new businesses; project simulations with real customers; product development with real demands, whether from companies, social organizations, communities, etc.; project-based events like startup weekends; entrepreneur graduation project: creating a company as the final project; creating a business, from idea to pitch.
Problem-based learning	Resource management challenges: how to multiply an amount or manage sandwich production; seminars with technologies and application challenges; opportunities identification based on problems presented in common magazines; solving management problems at classmates' companies, NGOs in the region or invited companies; problem solving on real demands brought by startups.
Reflective learning	Self-assessment exercises and reflections about entrepreneurial competences; shadowing with real life entrepreneurs.

Note: Elaborated by the authors

The 20 other practices are distributed among problem-based or project-based learning, with reality being presented in conjunction with large companies, startups, or services to the community—the latter being considered effective in the experiential approach by Furman and Sibthorp (2013).

The benefits of the use of active methodologies and the experiential approach are highlighted in a series of works on entrepreneurship teaching (Haag & Gabrielsson, 2019; McNally et al., 2018; Nabi et al., 2017; Noyes, 2018; Shirokova et al., 2018). In this regard, the use of design-led models with procedures based on design processes (iteration, prototyping, and understanding of the user context), as well as design thinking tools also address this topic, which reinforces the works of Huq and Gilbert (2017), Linton and Klinton (2019) and Zancul et al. (2017).

When comparing the results of the present study with those of Ruskovaara and Pihkala (2013), differences and similarities can be deduced. The use of active approaches by teachers with higher qualifications or experience in entrepreneurship is one of the similarities, based on the premise that the sample offered here turned to teachers recognized for their competence.

On the other hand, the emphasis on passive and expository methods, highlighted by the aforementioned authors, is configured as something quite distant from the result put forward in the present study. Despite this, it is understood that the difference is due to the nature of the study, since Ruskovaara and Pihkala (2013) sought a large sample to understand the general distribution of a teaching profile, most of them with little qualification in entrepreneurship, with this group being responsible for highlighting passive methods.

In any case, the present study corroborates the results found by Ruskovaara and Pihkala (2013), i.e., teachers with experience, who seek to improve their knowledge for the teaching of entrepreneurship, turn, in some way, to active teaching practices.

The role of the Kolb cycle in the learning process is also rescued here (Kolb, 2014), whereby action without reflection does not complement the cycle; therefore, the simple use of active methodologies can carry with it an implementation failure, since the isolated activity does not guarantee learning, there is always a need for a cycle that considers the process of reflection on the experience.

Analyzing the trajectories of entrepreneurship teachers is also a contribution, since it is still a poorly studied subject (Dominik & Banerji, 2018; Fayolle, 2013; Hannon, 2018; Ilonen, 2021; Neck & Corbett, 2018). This is in addition to their individual differences, which are directly impacted by their personal trajectories and previous experiences, which may be the differential that generates so many contradictions in the results found in the literature (Huq & Gilbert, 2017; Martin et al., 2013).

The role of professional experiences in large corporations or small/family companies, entrepreneurial experiences, and those acquired internationally impact the training of the interviewed teachers. These three aspects, therefore, constitute important 'pathways' for future studies, as well as elements of attention for public decision-makers regarding the training of teachers of entrepreneurship.

The strategy of sending professors to acquire international experiences, for example, was adopted as one of the

initial actions by the Chinese government in order to encourage entrepreneurship in universities, as Zhou and Xu (2012) point out. The same also happens with academics in Brazil, who are sent to other countries to develop entrepreneurial skills, as pointed out by Dal-Soto et al. (2021). This strategy encourages (a) the development of academic and professional collaboration networks, (b) contact with other best practices in the entrepreneurship teaching, (c) exposure to other agents of the educational ecosystem in this area of knowledge, as well as their arrangements, and (d) contact with new knowledge and ways of undertaking entrepreneurship.

Limitations of the present research are (a) the qualitative approach which, although fundamental for the depth and specificity sought, presents natural limitations, such as the difficulty of generalization, among other aspects related to the design and scope of the work; (b) the objective of the entrepreneurship courses, generally aimed at the development of competences, being exceptions those that encompass the concrete process of creating a company (teaching through entrepreneurship), which restricts the replicability of the results; (c) the nature of the courses, bearing in mind that the best practices used by most professors take place in public universities or highly competitive higher education institutions, emphasizing their elitist character, since students usually have greater access to resources, and teachers have greater freedom to explore different techniques; and (d) entrepreneurship education takes place in higher education degrees, with an average duration of four to five years, which makes it difficult to replicate the results in contexts where the incentives and dedication of the participants are different.

Future studies may benefit from analyzing the practices identified here, in questionnaires or other mechanisms for confirmatory and quantitative research. The arguments of Etzkowitz (2013), Politis (2005) and Ribeiro and Plonski (2020), about the fact that the training of entrepreneurs goes beyond classrooms is also noteworthy in this sense. The present research, however, is focused on the classroom, not presenting all the possibilities that deserve to be explored.

In addition to the theoretical contribution, represented by the in-depth study of the literature on the researched topic, the present study aims to encourage entrepreneurial practice, allowing entrepreneurship teachers to appropriate the activities presented here so that they can guide their efforts in the classroom.

Conflict of interest statement

The authors declare that there is no conflict of interest.

Authors' statement of individual contributions

Roles	Contributions			
	Ribeiro ATVB	Ferragi CA	Zanotto MAC	Cardoso ACF
Conceptualization	■	■	■	
Methodology	■	■		
Software				
Validation				
Formal analysis	■	■	■	■
Investigation	■	■		
Resources				
Data Curation	■	■		
Writing - Original Draft	■	■		
Writing - Review & Editing	■	■		
Visualization	■			
Supervision				
Project administration	■			
Funding acquisition				■

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