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ENTREPRENEURIAL EDUCATION IN HIGH SCHOOL IN BRAZIL: ONTOLOGICAL AND EDUCATIONAL APPROACH

A EDUCAÇÃO EMPREENDEDORA NO ENSINO MÉDIO NO BRASIL: ABORDAGEM ONTOLÓGICA E EDUCACIONAL

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Abstract

This theoretical-empirical study aims to analyze cases of high school Entrepreneurial Education (EE), from an ontological point of view - examining the levels of meaning "about", "for" and "through" entrepreneurship - and educational - learning objectives, target audience, contents, teaching-learning and assessment methods and results. The analysis of the cases and triangulation of data from the eight initiatives identified two groups - "Business Creation" and "Entrepreneurial Behavior" - that offer a comprehensive overview of possible approaches to EE at the secondary level. The results contribute to educational managers and those responsible for developing curricular guidelines and implementing entrepreneurship in high school.
Keywords: Entrepreneurship Education. High School Education. Secondary Education. Business Creation. Entrepreneurial Behavior.

Resumo

Este estudo teórico-empírico objetiva analisar casos de Educação Empreendedora (EE) no ensino médio, sob o ponto de vista ontológico - examinando-se os níveis de significado "sobre", "para" e "através" do empreendedorismo - e educacional - objetivos de aprendizagem, público-alvo, conteúdos, métodos de ensino-aprendizagem e de avaliação e resultados. A análise dos casos e triangulação dos dados das oito iniciativas identificou dois grupos - "Criação de Negócios" e "Comportamento Empreendedor" - que oferecem um panorama abrangente de abordagens possíveis para a EE no nível médio. Os resultados contribuem para gestores educacionais e responsáveis pela elaboração de diretrizes curriculares e implementação do empreendedorismo no ensino médio.
Palavras-chave: Educação Empreendedora. Ensino Médio. Criação de Negócios. Comportamento Empreendedor.

Introduction

Encouraging entrepreneurship and entrepreneurial culture has advanced in discussions in public and private institutions around the world. The United Nations (UN) included entrepreneurship in the 2030 Agenda for Sustainable Development stating it on education and economic growth goals (UN, 2015). Entrepreneurship contributes to the expansion of jobs and competitiveness, being highlighted in the educational sphere due to the importance of developing in young people, from the school stage, entrepreneurial attitudes and skills (European Commission, 2002; Frese et. al., 2014), and these business skills will result in more wealth for countries (Purwana & Suhud, 2017). Additionally, Sarasvathy and Venkataraman (2011) argue that Entrepreneurship Education (EE) should be treated as an essential part of basic education.

Sreenivasan and Suresh (2023) emphasize the great interest in the topic of EE, which has attracted many studies and evaluations of the literature already produced, gaining space in renowned journals. In the 20-year bibliometric review carried out by them, they tracked 2185 articles indexed in the Scopus database. The authors comment that, over time, theoretical and methodological rigor has strengthened, but it is still clear that there are few EE initiatives in which the approach to EE is clearly revealed. Although the European Union (EU) emphasizes the development of young people's entrepreneurial skills and attitudes, favoring employability, there seems to be more focus on developing knowledge and skills for opening new companies. This approach tends to be more prominent in the United States of America (USA), a country with an entrepreneurial culture, where the increase in interest in the topic is highlighted by Greene et. al. (2015), who point out strong engagement by universities in the expansion of EE, as well as the interest of business incubators and investment funds in new businesses.

In the review by Sreenivasan and Suresh (2023), the absence of references (articles or use of the term) of EE at the secondary education level is striking. Thus, even though Greene et. al. (2015) mention the strong movement of EE in higher education in the USA, it seems that there is still a lot of room for advancement in secondary education in the USA and around the world.

In Brazil, fundamentals of entrepreneurship were included in secondary-level technical professional education programs (MEC, 2013) and, in 2017, entrepreneurship became part of the National Common Curricular Base (NCCB) of the new secondary education, with an implementation period of up to 2022 (MEC, 2017). Such guidelines demonstrate a certain delay by regard to EE initiatives in primary and secondary education cited in academic publications since the early 2000s, such as *Pedagogia Empreendedora*, *Jovem Empreendedor Primeiros Passos* and *Mini company* (Alcantara, Coelho, Forte, & Rocha, 2018; Dolabela & Filion, 2013; Farias, Freitas, & Santos, 2012; Liberato, 2007).

Given the importance of EE in its different approaches in the school context, there is an interest in better understanding those aimed at secondary level students. Considering that the trajectory of this type of teaching is just beginning when it comes to basic education (Marcovitch & Saes, 2020), there is room for research on "the content to be taught, how to teach it and whom to teach it to" (Schaefer & Minello, 2016, p. 78). Although there are already publications that deal with national initiatives, there is a gap in relation to an overview of existing initiatives and their ontological and educational structure, according to the EE model proposed by Fayolle & Gailly (2008). These authors point out the need for all EE initiatives to state, at the ontological level, which meaning of EE is being employed - whether it is the strict or the broad meaning of entrepreneurship (Fayolle & Gailly, 2008; Lackéus, 2015) or which approach from the three ones - "about", "for" and "through" entrepreneurship - they are aligning with (Jamieson, 1984; Moberg, 2014a). These premises will guide the planning of the EE initiative, which should answer 5 key questions: why, for whom, for what results, what content and how to teach them

(Fayolle & Gailly, 2008).

Thus, the objective of this research in Brazil aims to analyze cases of EE initiatives, in high school, from an ontological point of view - examining the levels of meaning "about", "for" and "through" entrepreneurship - and educational - learning objectives, target audience, contents, teaching-learning and evaluation methods and results. The aim is to contribute to the mapping of EE cases in high school, indicating the ontological approaches to which they align and the main aspects of their pedagogical projects, in order to expand knowledge and discussion about the different possibilities of inserting EE in secondary education and offer useful information for that educational managers and professionals in the field better structure courses and programs. It is also expected to point out new study opportunities to academics and researchers.

This article comprises the sections: theoretical framework, methodological procedures, presentation of the results and final considerations. The theoretical framework addresses the characteristics of EE, the EE model with the ontological and educational levels, the three EE approaches -"about", "for" and "through", international EE initiatives in secondary education and EE in secondary education in the Brazilian context. Methodological procedures focus on the research approach used and justifications, the types of data collected, the data collection instrument, the analysis categories and how the analysis was developed. When presenting the results, the identified cases are synthetically described and the groups "business creation" and "entrepreneurial behavior" are presented. Final considerations follow.

Theoretical Reference

Next, we focus on characteristics of EE, international EE initiatives in secondary education and initiatives in the Brazilian educational context.

EE Characteristics

EE originated in university business schools. Since Harvard Business School in 1945, the offer of entrepreneurship courses has expanded around the world (Vesper & Gartner, 1997) as well as the discussions by organizations focused on research on the topic (Greene et al., 2015).

Fayolle and Gailly (2008) and Lackéus (2015) point out two perspectives of entrepreneurship that would guide EE: 1. strict - meaning identification of opportunities, business development, self-employment and the creation and growth of enterprises; 2 broad - referring to attitudes of an entrepreneurial person such as autonomy, creativity, initiative and action orientation. Therefore, Fayolle and Gailly (2008) recommend that EE initiatives explicit their conception of entrepreneurship, because this clarity at the ontological level will allow the elements at the educational level to be consistent.

The EE model by Fayolle and Gailly (2008, p.575), shown in figure 1, was partially inspired by Béchard & Grégoire (2005). Fayolle & Gailly (2008) present two levels, ontological and educational. Like Béchard and Grégoire (2005), the authors call for educators to be clear about the ontological level, which involves their key concepts: What is the meaning of entrepreneurial education? In the context of entrepreneurship, what does education mean? And how do you conceive the educator and participant roles? From there, the educational level of the EE initiative is designed.
The educational level (Fayolle & Gailly, 2008, p. 575) is structured according to 5 questions: why - what are the objectives and goals; for whom - who is the target audience; for what results (evaluations); what - contents, theories; and how - methods and pedagogies. Béchard and Grégoire (2005) indicate that the ontological dimensions are translated into this operational level (called educational by Fayolle & Gailly, 2008), so that all implementation of initiatives are consistently linked to the ontological level, with which Mwasalwiba agrees (2010).

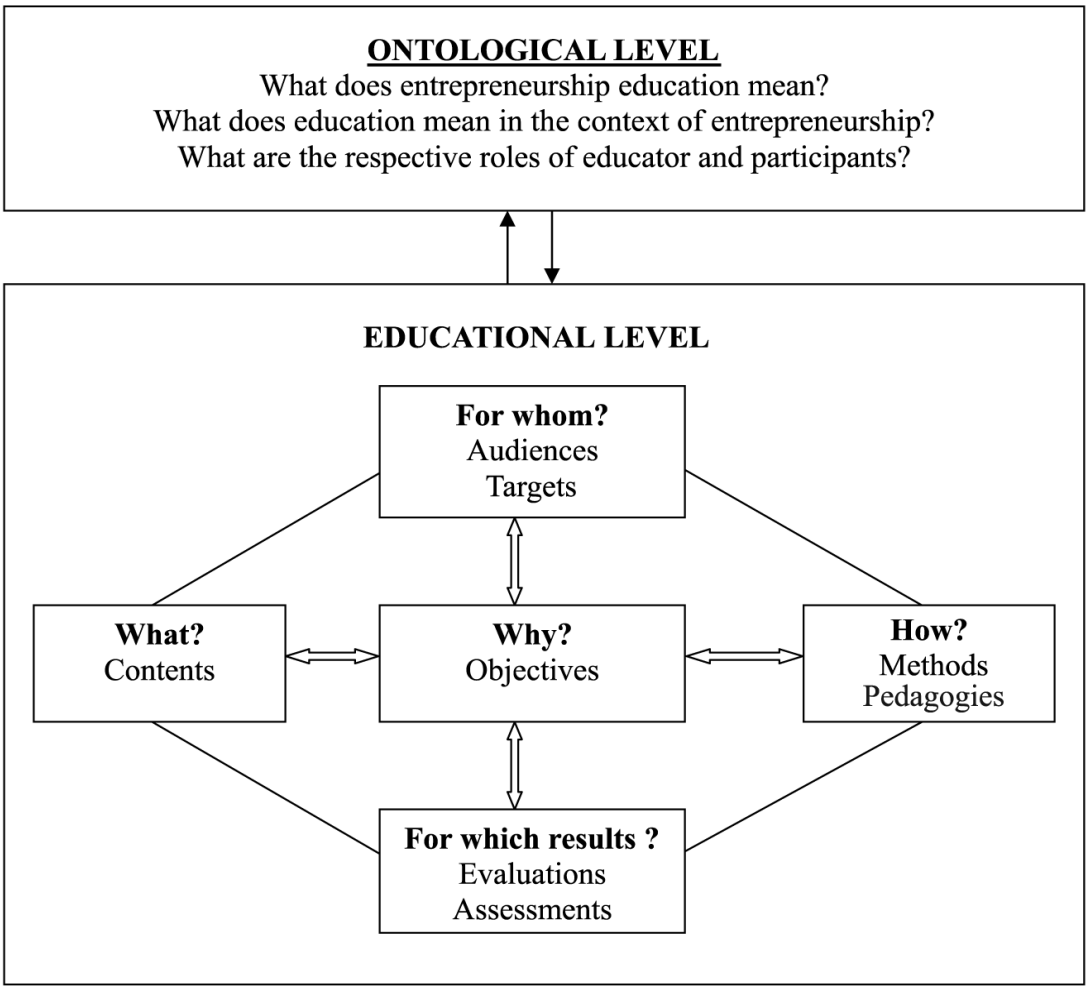

Figure 1. EE Model by Fayolle & Gailly (2008)
Source: Fayolle & Gailly (2008, p. 572).

Focusing again on the ontological level, the diversity of EE programs and practices (Hoppe, 2016; Mwasalwiba, 2010) has also been categorized according to three approaches, according to the ontological meaning of EE. Several authors propose three categories of EE, initially indicated by Jamieson (1984), and which evolved into education "about", "for" and "through" entrepreneurship (Hannon, 2005; Hoppe, 2016; Jones & Iredale, 2010; Lackéus, 2015; Moberg, 2014b; O'Connor, 2013). These three EE approaches align with those pointed out by the European Commission (European Commission, 2012), and which result from different emphases in knowledge, skills and attitudes. Thus, it can be said that:

1. Education "about" entrepreneurship privileges the acquisition of knowledge, corresponding to learning about entrepreneurship.

2. Education "for" entrepreneurship prioritizes the development of entrepreneurial skills, corresponding to learning to become an entrepreneur.

3. Education "through" entrepreneurship privileges the development of attitudes, corresponding to learning to have an entrepreneurial spirit.

Moberg (2014a) uses some of the key questions (educational level) of the Fayolle & Gailly (2008) model to relate to the "about", "for" and "through" approaches to entrepreneurship. Education "about" entrepreneurship privileges the acquisition of knowledge, presents more theoretical aspects, addresses what entrepreneurship is and what the entrepreneur does; thus, corresponds to the strict meaning of entrepreneurship, and is more common in higher education (Lackéus, 2015; Moberg, Fosse, Hoffman & Junge (2015); Mwasalwiba, 2010). This is a very common approach, in which courses emphasize content, which is developed in a traditional way, based on conceptual bases exposed in articles, texts and books (Kirby, 2007; Lackéus, 2015; QAA, 2018). The learning objective is for the student to learn about concepts, theories, understand and become aware of the phenomenon, and even become interested in this career option.

Education "for" entrepreneurship aims to develop the knowledge and entrepreneurial skills necessary for potential, future, or nascent entrepreneurs (Lackéus, 2015, p. 10), therefore orienting itself towards the entrepreneur's occupation. In this way, educating "for" entrepreneurship focuses on the knowledge and skills that entrepreneurs need in their practice (Kirby, 2007; Lackéus, 2015) and provides the opportunity to reinforce their skills and consider the future (QAA, 2018). Therefore, education "for" entrepreneurship is a mix of theory and practice, with practice being based on theory. Moberg (2014a) points to the intersection between education "about" and "for" entrepreneurship, in terms of content, cognitive entrepreneurial skills and the objective of raising students' awareness about self-employment as a career possibility (Moberg, 2014a). Furthermore, the "for" approach to entrepreneurship can result in an increase in the level of competence in managing uncertainty and ambiguities, and greater understanding of the application of specific knowledge on the topic.

Moberg (2014a) suggests that the "through" approach is indicated when the objective of EE is to develop creative and proactive students, who apply the knowledge acquired in an innovative way. And Lackéus (2015) highlights that entrepreneurial education "through" aligns with the broad meaning of entrepreneurship, being relevant for all levels of education and for all students. This EE approach is, at the same time, very necessary and challenging, given that it is based on action pedagogy, focusing on experiential learning, demanding pedagogical changes and teacher training (Arruda et. al. 2016, Lopes, 2020). In general, apprentices are encouraged to create, develop skills, and learn about aspects of business, engaging in a real process of entrepreneurial initiative (Lackéus, 2015). It can be integrated into all courses and is normally implemented in an experiential way. However, it is an approach that faces several obstacles and limitations in resources, time, cost, assessment difficulties, understanding and resistance from teachers.

It has been shown that EE involves a wide variety of objectives, and it encompasses much more than preparing individuals to be entrepreneurs (Hytti & O'Gorman, 2004). The relationship between the learning objectives and the course's pedagogical methods is addressed by Blenker et.al. (2011): if the objective is to teach students how to start a business, it is necessary to offer them a set of skills to do so; on the other hand, if the objective is to develop student's entrepreneurial mindset, it will be necessary to emphasize attitudes and another set of skills. Therefore, the choice of pedagogical methods and techniques depends mainly on the objectives, content, and contextual factors. These choices allow you to identify the implemented EE approach. Fayolle and Gailly (2008) highlight that active, experiential, "learning by doing" pedagogical methods and those that simulate the real world are prioritized in EE approaches "for" and "through" entrepreneurship, as they allow the creation of situations and problems that They mainly develop non-cognitive (socio-emotional) skills. Several authors argue that entrepreneurship needs to be connected with "learning by doing", highlighting the importance of lived experience (Politis, D., 2005; Israr & Hashim, 2017). Greene et. al (2018) share the current view that EE participants develop skills and knowledge from action-based and interactive learning approaches, increasingly linked to business and the community (Boon, Van der Klink, &

Janssen, 2013).

From EE's point of view, it is crucial to focus on the student and that the situation, problem or challenge is as close as possible to the real business or life context, for motivating students in all aspects. However, the importance of reflecting on experience for the development of knowledge is highlighted, especially in conditions of high uncertainty and complex problems (Neck and Greene, 2011).

The active methodologies most frequently used in EE are problem-based learning, project-based learning, design thinking, and learning through games (Filatro & Cavalcanti, 2018; Moran, 2018; Bes et al., 2019).

In short, in problem-based learning, students are faced with a problem, stimulating their curiosity to solve it by applying already known principles or researching solutions, with the teacher as a facilitator. Thus, they actively engage, analyze the problem, help each other think, raise and answer questions, developing thinking skills, creating, defending and evaluating proposed solutions (McCaughan, 2013).

Project-based learning is structured around more complex and significant questions and problems for students, who seek solutions for creating products, processes, systems, or services. Students are challenged to examine, apply knowledge, seek action strategies, confronting uncertainty and risk, developing skills such as collaboration, critical thinking, decision making, self-confidence, creativity, and innovation (Dias & Brantley-Dias, 2017; Mergendoller, 2018; Moran, 2018). Mergendoller (2018) emphasizes that project-based learning follows six criteria: intellectual challenge and achievement, authenticity, public product, collaboration, project management and reflection.

Although design thinking (DT) was created by Herbert A. Simon in 1969, it was under the influence of the IDEO consultancy that, in 2011, it was systematized as a method and practice, arriving in Brazil the following year. In education, (DT) allows students to approach, in working groups, in an innovative way, the resolution of complex problems, making them focus on human needs, seeking to put themselves in the shoes of the people involved, so that they can reach to viable and functional solutions (Filantro & Cavalcanti, 2018; Moran, 2018). DT has been adopted in business courses at the university level and among adolescents to encourage the development of an entrepreneurial mindset (Zupan, Cankar, & Setnikar Cankar, 2018).

Learning through games (Game-Based Learning) is a strategy that integrates the power of games into educational activities. In this way, it engages students in activities that imitate real challenges, in a virtual environment, combining rules with the playful experience. Real subjects from the disciplines are integrated into the game, awakening curiosity and motivation for the activity, stimulating the development of cognitive and socio-emotional skills such as critical thinking and the construction of relationships to achieve the proposed objective or result (Neck and Greene, 2011; Moran, 2018).

In addition to the methodologies already mentioned, other methodologies commonly used in EE are mentoring offered by teachers, entrepreneurs or experts and workshops (Hytti & O'Gorman, 2004). And tools like Canvas (Business Model Canvas) prevails in the field of entrepreneurship (Jackson, Scott, & Schwagler, 2015).

More traditional methods, such as lectures with teachers or guests, visits and tasks, case studies and group discussions enable an understanding of entrepreneurial activity (Mwasalwiba, 2010), and can awaken people to this career option. Typically, traditional methods privilege the acquisition of knowledge, that is, they develop cognitive skills, more aligned with the level of education "about"

entrepreneurship (Lopes, 2020).

And finally, the evaluation of results should be considered as important as other elements of the EE initiative (Fayolle & Gailly, 2008), as it refers to the assessment of student learning - specific knowledge, specific skills and tools, classroom participation, and entrepreneurial intention. Nabi, Fayolle, Linan, Krueger and Welmsley (2017) state that only a quarter of the articles they reviewed identified their theoretical framework and Lackéus (2020) emphasizes that the effects of an EE intervention can only be evaluated if, firstly, it is possible to identify and classify the EE approach to which it aligns, and the five aspects of its educational structure.

Fayolle and Gailly (2008) and Fayolle (2018) point out that there is still a lack of studies on the results and effectiveness of EE. Bae, Qian, Miao and Fiet (2014) indicate that in one decade they registered 55 papers with contradictory results. The various authors indicate that existing studies examine the effects of EE on variables such as the intention to undertake, attitudes, and some skills of the participants, such as creativity, self-efficacy, among others.

It is noteworthy that Fayolle and Gailly's (2008) EE model, with the two ontological and educational levels, related to the characterizations of EE approaches by Moberg (2014a) and Lackéus (2015), constitute the categories that will guide, in this research, the analysis of Brazilian cases of EE in high school.

Next, international EE initiatives in secondary education are presented.

International EE initiatives in high school

In 2015, the Kauffman Foundation already noted an increase in EE initiatives in secondary education, as reported by JA Achievement USA: the number of states with guidelines related to EE no secondary education was 42, and the number of states that required this type of education was 18. Greene et al. (2015) highlighted that EE in secondary schools[1] was advancing in the USA, with the inclusion, in the national curriculum, of initiatives such as Lemonade Day, in which students practiced entrepreneurship by starting their own businesses.

Some EE initiatives, existing since 1990, are included in a report by the European Commission (2004), highlighting the role of non-profit organizations such as Young Enterprise Europe (more in secondary and higher education, focusing on business creation) and North American Junior Achievement (initially working more in primary schools, introducing the world of business), initiatives that came together in 2002.

More recently, the European Commission's report on EE in schools shows that more than half of European countries allocate investments to this type of teaching (European Commission/EACEA/Eurydice, 2016). For teaching in schools, the European Commission adopts the concept based on entrepreneurship as a key competence, aiming to develop skills and the ability to transform creative ideas into entrepreneurial actions (European Commission/EACEA/Eurydice, 2016). The inclusion of specific knowledge for starting a business, such as economics and business planning, is adopted by the Swedish government for EE in secondary schools (document Swedish Government Office, 2009, cited by Fejes, Nylund & Wallin, 2019). The development of general skills, such as project management and risk management, are also part of the content, as well as creativity and encouragement for students to take responsibility for achieving goals.

It is important to mention that, in some cases, the content and method are confused, as occurs with the creation of companies and the sale of products at school. Moberg (2014a) noted that studies that

measured educational outcomes did not distinguish between content and pedagogical methods.

Initially, the cases of EE in high school identified in academic literature were from European countries, with the exception of Israel. However, recently, Sreenivasan and Suresh (2023) found the predominance of authors from Asian countries in publications on EE, mainly from China. So, an effort was made to locate cases from other countries, and two were found: one in Indonesia and the other in South Africa. Figure 2 shows the identified examples.

Initiative	Country	Characteristics	Authors
Junior Achievement Company Program (JACP)	Portugal	Aimed at "secondary" students, between 16 and 18 years old, it offers the opportunity to create a company.	Chaves & Parente, 2011
	Israel	One-year practical training program with mini-enterprises (Young Entrepreneurs - Israel YE) with students aged 12 to 17.	Bergman et al., 2011
	UK; Wales	Study tested initiative aimed at young people aged 15 to 18. It sought to develop skills and abilities related to the business world.	Athayde, 2012
	Sweden	Educational initiatives applied to students, in partnership with public and private schools, with the support of volunteers who share their experiences and knowledge.	Elert et al., 2015
	South Africa	They compare two JACP interventions: one shorter and one longer, and the development of self-efficacy in students aged 15 to 18.	Bux S, van Vuuren J, 2019
Vitamin E	Spain	Elective program for students aged 14 to 16, covering: business knowledge, teaching and practice of entrepreneurial skills, business plan, interaction with entrepreneurs and networking.	Sánchez, 2013
Business School - "Enterprise Days"	UK	Practical program in which female students aged 11 to 16 run their mini-companies one day a month, in addition to the school's curriculum emphasizing the development of entrepreneurial skills and employability.	Do Paço et al., 2013
Youth Start - Entrepreneurial Challenges - YSEC	Portugal, Austria, Denmark, Luxembourg and Slovenia	Creation of a new method of teaching entrepreneurial skills through different types of challenges that can be implemented in primary and secondary schools.	European Commission/EACEA/ Eurydice, 2016; Moberg et al., 2015; Streicher, M. et. al., 2019
Eco-entrepreneurism	Indonesia	They examine the effect of EE and eco-entrepreneurship-based training on entrepreneurial skills in vocational secondary school students.	Suparno et. al. (2019)

Figure 2. Examples of international EE initiatives in secondary education.
Source: prepared by the authors.

Several initiatives in European countries and in Israel use the pedagogical methodology of creating a mini company from the Junior Achievement institution, in line with the strict definition of entrepreneurship as the creation of an organization. This is a methodology in which students get involved with the project of creating a mini company for one or two semesters, working from the idea, raising capital and division of shares, development of the prototype, product and processes, division of tasks and functions, being responsible for its operation (production, marketing, sales) until its closure and final balance (European Commission, 2015; Lackéus, 2020). In fact, this methodology is equivalent

to project-based learning, suitable for entrepreneurship education initiatives.

The Business School initiative - "Enterprise Days" (UK) appears to be a mix of education "for" and "through" entrepreneurship, as it stimulates the broad development of entrepreneurial skills, favoring employability in today's society, associated with the methodology of creation of the mini-company.

The Youth Start - Entrepreneurial Challenges - YSEC initiatives, in 4 European countries, use EE methodology centered on the EE triad model, challenging students to develop several skills: core to EE, entrepreneurial culture and entrepreneurial civic education (Trio model of Entrepreneurship Education, YSEC). So, the YSEC program seems to align with the "through" approach to entrepreneurship. The initiative developed in Indonesia focuses on entrepreneurial skills, especially focused on eco-entrepreneurship, in vocational secondary schools, and although its authors do not offer further details, it appears to align with the "through" approach to EE.

The following section focuses on EE in high school in the Brazilian context.

EE in high school in the Brazilian school context

In Brazil, based on the National Common Curricular Base (BNCC), entrepreneurship was included in secondary education (MEC, 2017), with its curriculum reformulated and updated in 2018 by the National Education Council (CNE) in the National Curricular Guidelines for Teaching Medium (DCNEM). The technical and professional training began to integrate the new curricular base as one of the training itineraries and entrepreneurship as one of the structuring axes.

Some states have also established a legal basis to include entrepreneurship in their education networks, such as Rio Grande do Sul, with the State Entrepreneurship Policy for technical and high school schools, established by Law No. 12,616, of 2006 and complemented by Law No. 15,410, of 2019. In the state of São Paulo, Law 15,693/2015 was approved and the State EE Plan (PEEE) was drawn up to include entrepreneurship in basic education, fundamental, secondary and technical levels (Marcovitch & Saes, 2020).

The literature points to cases in high school in federal institutes or state technical schools (Gomes & Silva, 2018; Malacarne, Brunstein, & Brito, 2014; Marcovitch & Saes, 2018), and in private schools (Vianna & Bondioli, 2017). Such as: Junior Achievement Brazil developed by the Junior Achievement Program (Alcântara et al., 2018; Machado, Fortes, Lima, & Santos, 2021), Awakening also developed by Sebrae (Liberato, 2007) and Entrepreneurship at School offered by Rede Pitágoras de Ensino and Embraer Institute of Education and Research (Acúrcio, 2005; Morais, 2009) and initiatives derived from the course "Pioneering and Entrepreneurial Education", developed by professor Jacques Marcovitch, who influenced initiatives in partnership with institutions such as the Paula Souza State Center for Technological Education (Centro Estadual de Educação Tecnológica Paula Souza - CPS, in portuguese), Sebrae, Colleges and NGOs (Marcovitch & Saes, 2018). However, in three cases, the meanings of entrepreneurship and entrepreneurial education that guide them are rarely made clear in these cases, and the educational aspects are also not usually fully informed. It is common to confuse content with pedagogical methods, and these are often popularly referred to for their striking characteristics and greater appeal to the public, and little focus on evaluating results and their impacts. This lack of detail makes it difficult to analyze the consistency of these initiatives and, consequently, to obtain knowledge that facilitates the possibilities of using them for new initiatives or their replication.

The next section describes the methodology adopted for this article.

Methodological procedures

This research has the objective is to analyze cases of EE in high school from an ontological point of view - examining the levels of meaning "about", "for" and "through" entrepreneurship - and educational - learning objectives, target audience, content, teaching-learning, assessment, and results methods. Therefore, this is a study with a qualitative approach, with a descriptive and interpretative character. The qualitative approach is justified, given the nature of the phenomenon studied, which is multifaceted (Godoy, 1995), and this approach allows capturing and analyzing the data in all its nuances. The main purpose of descriptive research is to describe characteristics of the phenomenon and establish possible relationships between variables (Gil, 2008). Due to the complexity of the phenomenon studied, involving several factors, these relationships can be explained and interpreted (Godoi, Bandeira-de-Mello and Silva, 2006) using multiple cases (Yin, 2001). The case methodology applies to contemporary phenomena inserted in the context of real life, in which the limits between the phenomenon and its context are imprecise (Yin, 2001), and is recommended when one intends to understand how the phenomenon occurs, especially if it is complex. The use of multiple cases allows us to examine and delve deeper into the different factors within the cases, as well as the similarities and differences between them (Yin, 2001). Although they suffer from the fragility of generalization, the results of multiple cases allow us to achieve greater understanding and deepen the interpretation of the phenomenon, obtaining knowledge that can be applied and disseminated (Yin, 2001).

To meet the objective of this research the methodological procedures to be used were defined and data collection and analysis followed the planned steps.

Documentary research (secondary data) and interviews (primary data) were adopted for the data collection. The documentary research provided auxiliary information and allowed to confirm the data and evidence collected by other instruments, increasing the reliability of findings through data triangulation (Martins & Theóphilo, 2009). The interviews were standardized, following a guide (Marconi & Lakatos, 2003) with the information to be obtained.

The script used for both document search and semi-structured interviews, was mainly based on the theoretical model presented by Fayolle and Gailly (2008). In addition to the key questions proposed at the educational level of the model, other information was included, based on the literature. Thus, an instrument was structured with the information to be obtained from each initiative in different contexts, to enable the analysis and comparison of the data collected (Figure 3).

Information to be obtained	**Dimensions**	**Source**
Initiative name	General data	(Hytti & O'Gorman, 2004)
Start year and total number of students graduated		
Hours/duration		
Educational levels		
Number of participating schools in 2019 and 2020 (estimate)		
Number of classes in 2019 and 2020 (estimate)		
Geographic coverage		
Learning Objectives	Learning objectives ("Why?" / "Why?")	(Fayolle & Gailly, 2008)
Main contents	Contents and types of initiatives ("What?"/ "What")	(European Commission/EACEA /Eurydice, 2016; Fayolle & Gailly, 2008; Moberg, 2014a, 2014b)
Scope, characteristics (mandatory, optional, interdisciplinary discipline, etc.)		
Teaching-learning methods	Teaching-learning methods ("How?"/ "How")	(Fayolle & Gailly, 2008)
Assessment methods	Results assessment ("For which results?"/"For which results?")	(Fayolle & Gailly, 2008)
Recorded results		

Figure 3. Structure of the data collection instrument.
Source: prepared by the authors.

For identification of high school EE cases, some criteria were defined by the authors, to allow initiatives structured as disciplines to be obtained, which had a certain continuity (tested more than once), with a workload that allowed better development of the objectives learning and educational proposal:

a) Initiative structured as a specific discipline or applied in a transversal, interdisciplinary way.

b) Minimum workload of 10 hours and minimum duration of 2 months.

c) Clearly defined learning objectives.

d) Methodology applied in at least 2 public or private schools, with two classes trained.

Firstly, a literature review was conducted, to verify cases mentioned in different sources such as books, magazines, articles, reports, websites, etc., searching for public sources (Marconi & Lakatos, 2003). Recommendations from people in the contact network were also used, such as professors and researchers in the field of entrepreneurship. 9 cases were selected, one of them was discarded because the initiative had been discontinued by the institution.

Data collection on EE cases in high school

Data collection began in April/2019, was interrupted in the second half of 2019, and resumed at the beginning of 2020. However, with the suspension of face-to-face classes in schools in the public and private basic education networks in mid-March/ 2020, due to the COVID-19 pandemic, all EE initiatives were impacted. Thus, data collection was completed in some cases in March/2021, with 2019 considered as the base year, including, when possible, data from 2020.

Initially, contact was made by email with the person responsible for the initiative, to present the research and request an interview by phone or online. And, to better understand the characteristics of the initiative, documents were requested for consultation (Figure 4). After data collection, the next step involved validating the information obtained from the person responsible for the case or from the materials consulted, recorded in the form filled out by the researcher (via email). This process, in some cases, took up to six months, depending on the availability of the person responsible for the initiative.

Case	Institution	Online interview	Collected documents
1. **Mini company**	Junior Achievement	Operations and Communication Manager	Volunteer and Student Handbook; Graduate Results; spreadsheet with the number of participating schools and students; website and interview.
2. JA StartUP			
3. InovaJovem	Innovate Unicamp	Communication Coordinator	2019 promotional material; InovaJovem Regulation 2019; website and interview.
4. Think Big (Pense Grande)	Telefonica Vivo Foundation	Social Project Manager	2019 Results Reports; Demoday report with works presented; Book Think Big; website and interview.
5. EDUEMPRÈM	Society for Scientific Porvir (Province La Salle Brazil-Chile) and La Salle University	Administration Course Coordinator	Eduemprèm notice; Participation as a project evaluator and as a spectator at the final event; website and interview.
6. **Growing and Undertaking** (Crescendo e Empreendendo)	SEBRAE	Analyst at the Entrepreneurial Culture Unit	2020 Solutions Catalog; Booklet for EAD training – Teacher; spreadsheet with number of students served; website and interview.
7. Awakening (Despertar)			
8. IFA – Campaign Mode (IFA - Modo Campanha)	Instituto Making Happen (IFA)	Initiative Coordinator	2018, 2019 and 2020 Results Reports available on the website; sample of textbooks for high school; interview.

Figure 4. EE cases and types of data collection.
Source: prepared by the authors.

Analysis and analysis categories

For the analysis, the categories of analysis indicated by the EE model of Fayolle and Gailly (2008) were followed at two levels: ontological and educational. An Excel spreadsheet was used in which the data collected from the different sources for each case were organized and integrated, configuring data triangulation, and which were examined according to the analysis categories (Figure 5).

	Categories	Description
EDUCATIONAL LEVEL	General data of the initiative	• Name and year of start; educational levels/target audience • Number of participating schools and students graduated • Workload
	Learning objectives	• Develop entrepreneurial skills; entrepreneurial behavior and mentality; understand business and the key areas of a company.
	Types of teaching-learning methods	• Traditional teaching methods (lecture, dialogued class, group discussions, counseling and mentoring, visits, etc.) and active methods (problem-based learning, project-based learning, business simulation, games and competitions, peer learning, flipped class, case study).
	Main contents	• Topics, concepts, theories covered, entrepreneurial skills and attitudes, business plan, presentation of tools such as Canvas, Minimum Viable Product (MVP), design thinking, pitch, prototyping, game, project, etc.
	Results assessment	• Learning assessment methods • Recorded results
ONTOLOGICAL LEVEL	Approach used in EE cases	• Education "about": more theoretical aspects, self-employment as a career possibility; cognitive abilities. • Education "for" entrepreneurship: cognitive and non-cognitive knowledge and skills; training for work. • Education "through" entrepreneurship: encouraging the development of entrepreneurial attitudes and skills in all contexts; formation of the individual as an entrepreneurial citizen.

Figure 5. Description of analysis categories
Source: prepared by the authors based on the theoretical framework.

The analyzes and the discussion of the results were structured in steps (adapted from Gioia et al., 2012): exploration of primary and secondary data compiled in the spreadsheet about each of the initiatives, followed by theoretical interpretation in the development of intra-case and inter-case analyzes (Miles & Huberman, 1994).

The intra-case analyzes considered the consolidated data from each of the EE cases in high school, and this step allowed the main educational characteristics of each of them to be highlighted, making it possible to make interpretations for a first identification of types of ontological approaches. As the analysis progressed in intra-case comparisons, reflecting on the theoretical framework adopted, it was possible to point out similarities and differences, which led to the grouping of cases of EE initiatives in high school into two groups. Analyzes of the cases that made up the two groups were also developed in order to identify similarities and their specificities.

The results of the analysis will be presented below.

Presentation and analysis of results

Based on the pre-defined criteria, 8 cases of EE in high school were identified: Mini company, JA StartUp, InovaJovem, Think Big, EDUEMPRÈM, Growing and Undertaking, Awakening and IFA - Campaign Mode.

Synthetic description of EE cases in high school

Cases 1 and 2 **Mini company** and **JA Startup** are offered by Junior Achievement, a North American, private, non-profit institution, created in 1919 and present in 120 countries. **Mini company** began in Brazil in 1983 and is offered to schools as a separate course (after-school). They have partnerships with state and federal technical institutes, as well as public and private schools. In the state network of the state of Ceará, the initiative is part of the curriculum as an elective subject. Students experience the creation and management of a company and its departments, learning economics and business concepts. **JA Startup** was created in 2017, and is based on the use of modern entrepreneurship concepts and tools such as Design Thinking to create disruptive business models, also operating in public and private schools.

Case 3 - **InovaJovem**[2] - is offered by the Unicamp Innovation Agency (State University of Campinas), which has worked in partnership with regular and technical high schools across Brazil since 2014. It is an initiative outside the curriculum, formatted as an online competition for business ideas that contain an innovative element of social impact, based on pre-defined themes (in 2019 they were: health and well-being; quality education; clean and accessible energy; sustainable cities and communities; consumption and responsible production). Includes online training and mentoring.

Telefonica Vivo Foundation (from the company Vivo and part of the Telefonica group) is responsible for case 4 - **Think Big** - operating in Brazil since 2013. In partnership with regular and technical high schools, teachers are trained as multipliers to work on content entrepreneurship, technology and, above all, social impact, which seeks to train young protagonists in their communities.

Case 5 - **EDUEMPRÈM** - has been applied since 2018 in schools in the La Salle Network, part of the La Salle Brazil-Chile Province group, present in Brazil since 1907. The training of the professionals involved (including teachers from La Salle University) is carried out by representatives from La Salle Technovade Barcelona, a startup incubator located in Spain. It is offered as a complementary after-school activity and focuses on the development of innovative solutions.

SEBRAE, the organization responsible for cases 6 and 7 - **Awakening** and **Growing and Undertaking**, is recognized for its over 25 years of experience in "developing entrepreneurship solutions for formal education" (SEBRAE, 2020, p. 5). Until 2019, the **Awakening** and **Growing and Undertaking** initiatives were offered in person, both to formal educational institutions and to social projects. The number of young people served is significant, exceeding 50 thousand in 2019 in each of the programs, and reaching almost all states of the federation.

And finally, case 8 - **IFA Campaign Mode** - consists of workshops in an extracurricular format offered to children and young people aged 10 to 18, created by Instituto Fazendo Acontecer (Making it Happen Institute), a private non-profit entity dedicated to "disseminating entrepreneurship among children and teenagers in a playful and fun way" (IFA, 2018).

The inter-case analysis revealed some similarities, making it possible to classify EE initiatives into 2 groups: 1. "Business Creation" - whose content includes the formation of companies and the creation of products or services (Alcantara et al., 2018; Elert et al ., 2015; Fejes et al., 2019); and 2.

"Entrepreneurial Behavior" - whose content addresses the topic of entrepreneurship and related aspects, such as entrepreneurial attitude and behavior, the job market and planning for the future.

In the sequence, each group of cases is analyzed and discussed according to the educational level categories.

"Business Creation" Group

The five cases in this group (figure 6) have their content focused on creating a new business (Hytti & O'Gorman, 2004; Mwasalwiba, 2010), using active and experiential methodologies referred to as "hands-on" or "learning by doing"[3], typical of learning project-based. Thus, they seek to mirror the real world and encourage the development of non-cognitive skills, therefore aligning with the "for" and "through" approaches to entrepreneurship (Fayolle & Gailly, 2008; Johansen & Schanke, 2011). Only the **Think Big** initiative addresses the role of the entrepreneur, the types of people who become entrepreneurs and their motivations, aspects that characterize teaching "about" entrepreneurship (Blenker et al., 2011; Hannon, 2005; Johansen & Schanke, 2011).

Mini company is offered on a non-shift basis, in 15 weeks, totaling 52 hours, the second highest workload among the cases. Present in international publications (Athayde, 2012; Johansen & Schanke, 2011; Lindqvist, 2017), it was the object of study in Ceará (Alcantara et al., 2018) and Pará (Machado, Fortes, Lima, & Santos, 2021). It is the only initiative that includes "practical experience in economics and business, in the organization and operation of a company" (Hytti & O'Gorman, 2004; JA, 2014), and aims to develop entrepreneurial skills and other skills such as teamwork , negotiation and creativity, (Mwasalwiba, 2010).

The other four cases - **JA Startup, InovaJovem**, **Think Big** and **EDUEMPRÈM** - follow the "startup" model, encouraging the identification of problems, search for solutions and preparation of a business plan, using tools with the aim of transforming ideas into impactful startups. Unlike the **Mini company** (with manufacturing of the created product), the "startup" model involves the business modeling, MVP and prototyping stages, ending with the presentation of the idea (pitch).

The proposed structure is reflected in the working hours, and three are similar - **JA Startup**, **InovaJovem** and **EDUEMPRÈM** - between 10 and 24 hours in total. The Think Big initiative has the largest workload (60 hours), justified by the most comprehensive content: topics related to technology, the search for solutions to community problems, and topics such as self-knowledge and an entrepreneurial attitude. **InovaJovem** and **EDUEMPRÈM** also encourage solutions with social impact, similar to the initiative called "Seeds of the Future", in which students exercise ways of solving problems such as poverty and child labor using business tools (Berglund et al., 2017).

Regarding the methods of teaching and learning, face-to-face and online workshops, visits, lectures and mentoring with businesspeople are used, in line with what Hytti & O'Gorman (2004) and Mwasalwiba (2010) point out as methods adopted in EE. **EDUEMPRÈM** and **Think Big** participants have access to Fab Labs[4], used for prototyping. Other tools and methodologies are adopted: (a) Canvas (Business Model Canvas), a predominant pedagogical tool in the field of entrepreneurship (Jackson et al., 2015); (b) Design Thinking, an effective methodology to stimulate the development of an entrepreneurial mindset in adolescents (Zupan et al., 2018); (c) pitch training, a sales argument training (Greene et al., 2015).

Regarding learning assessment, similarities were found on some pre-defined criteria, groups evaluated in stages, and a final award. In terms of results according to a survey of 1276 graduates of JA **Mini company**, from 1995 to 2015, 49% said they owned or had already had their own companies, and

indicated that the program motivated them to think about their careers and set goals for life. In 2019, teachers participating in **Think Big** at a school in São Vicente - SP - reported the positive evolution of even students with depression, and that some with communication difficulties discovered that they had this ability. Some of the projects created by the students follow startup paths, such as incubation and opening to angel investors, as reported by those responsible for four initiatives. Thus, there is a mix of quantitative follow-up studies and unsystematic collection of success cases.

Group "Entrepreneurial Behavior"

It is comprised of three cases whose content includes themes that seek to stimulate attitudes and behaviors related to entrepreneurship (Mwasalwiba, 2010), helping people to become more entrepreneurial in their lives and more prepared for the world of work (Hytti & O'Gorman, 2004). Although case 7 - **Awakening** (SEBRAE), includes the creation of a product and the organization of the "Young Entrepreneur Fair"(FJE), this is not the predominant topic, as will be explained later, which is why it was classified in the "entrepreneurial behavior" group.

Case/ Workload	Content	Learning Objectives	Teaching-learning methods	Assessment strategies	Recorded results
1. Junior Achievement Mini company / 52 hours in 15 weeks	Concepts of free enterprise, market research, fundraising, marketing and production, return on capital.	Have practical experience in organizing and operating a company; develop socio-emotional skills.	Project-based learning ("learning by doing"): product creation and company management practices; online lectures on innovation, social business, and training on Canvas and Mini-Company Fair.	Financial balance; company activity reports.	Survey of 1,276 graduates: young people feel more motivated to open a business. Awards.
2. *JA StartUP*/ 24 hours in 8 weeks. Online: 15 hours	Creation of startups, idea X product, Minimum Viable Product (MPV), prototype, sales, Pitch5, DemoDay[6]	Know entrepreneurship concepts and business creation tools; develop skills to transform ideas into startups.	Project-based learning ("hands-on", learning by doing), case studies; mentoring; design thinking.	*Startup* assembled; Demoday for groups to present.	*Startups* received investment; another was recognized by the government of Rio de Janeiro (an idea that operates in the city).
3. InovaJovem / 10 hours Online; 2 months to 2 and a half months	Competition of online business ideas based on innovation and social impact - projects linked to the UN Sustainable Goals - SDGs.	Training on entrepreneurship and innovation. Recognize entrepreneurship as a career option.	Online workshop; mentoring with entrepreneurs; pitch training; business modeling (Canvas).	Business model (Canvas); commercial viability; clarity of the value proposition; differential.	Students who undertook the developed solution. Patent filing by the team.
4. Think Big / 60 hours	Individual; community; social entrepreneurship and technology; business model; team; opportunity; pitch.	Experience social entrepreneurship, creating solutions to socio-environmental problems; develop entrepreneurial skills.	Project-based learning ("hands-on"; learning by doing); practical experiences; individual and group dynamic activities.	Criteria: innovation, feasibility, technology, socio-environmental impact, process, and commitment.	In 2019, 30 social businesses were selected from those registered to undergo incubation.
5. EDUEMPRÊM / 13 hours distributed in 13 weeks	Entrepreneur and team; problem and search for innovative solutions; business model and pitch.	Promote the development of attitudes, capabilities, and values through social entrepreneurship.	Canvas: prototyping; *Fablab*, mentoring (visit to the software house, talk to professionals in the field).	Website creation on a free platform; value proposition, feasibility; technology; innovation, social impact.	The 2019 project was classified in Amazônia UP, a pre-acceleration program.

Figure 6. Cases of EE group "Business Creation"
Source: prepared by the authors based on research data

Figure 7 presents the EE cases in the "Entrepreneurial Behavior" group.

Case / Workload	Content	Learning objectives	Teaching-learning methods	Assessment strategies
6. Growing and Undertaking (SEBRAE) / 12 hours – 3 appointments Online. Includes online training for teachers and managers – 23 hours	Entrepreneurial attitudes; entrepreneurship in life, in the world of work and business; Thinking about the future.	Opportunity to discuss topics: work, business, and entrepreneurship.	Dialogued exhibition, educational experiential activities.	Formative assessment: use of a Learning Diary to write down reflections, doubts, and learning during the development of this course. Assessment of projects. The Young Entrepreneur Fair - YEF is also used as an assessment tool.
7. Awakening (SEBRAE) / 44 hours – 22 meetings divided into topics. Includes 32-hour online training for teachers and managers	Self-knowledge; entrepreneurial behavior; world of work; creativity and innovation; personal and professional planning; creating and planning a business. Content in 3 stages: in the classroom, field activities, and organization of the Young Entrepreneur Fair (YEF).	Expand vision: entrepreneurship, cooperation, citizenship, and ethics. Identify potential and discover opportunities.	Group dynamics, lecture and experiential classes, project-based learning.	
8. IFA - Campaign Mode / 10 hours – 5 meetings	Challenges based on problems of society: My own house; show Talents; Paper Tower; Transportation of the Future; Whom I admire.	Entrepreneurship as a set of competences for personal development and preparation for professional challenges.	Playful workshops with practical activities and gamification; rewarding participants (entrepreneurial powers).	Students answer what they learned, how the solution was adopted, and what results they achieved.

Figure 7. Cases of EE group "Entrepreneurial Behavior".
Source: prepared by the authors with research data.
FJE: Young Entrepreneur Fair

As for the content, the case **Awakening** (7) covers topics related to the labor market, the development of personal skills and competencies (European Commission/EACEA/Eurydice, 2016), and the assessment of opportunities and organization of an entrepreneurial fair (Fejes et al., 2019). **Growing and Undertaking** (6) has a shorter workload and content focused on entrepreneurial behavior, the job market, and planning for the future, knowledge considered important for entering the job market (Gomes & Silva, 2018). These contents are related to the type of teaching "about" and "for" entrepreneurship, as they stimulate the development of cognitive entrepreneurial skills, such as knowing about the role of entrepreneurs, evaluating business ideas, and how to start them (Moberg, 2015).

The learning objectives of **IFA – Campaign Mode** (8) aim for participants to perceive entrepreneurship as behavioral characteristics that help them in their professional future. The content includes playful challenges that encourage participants to create and build ways to solve something. Similar, then, to the playful approach used in the Seeds of the Future initiative in Swedish schools, in which children participate in games, role-play, and do creativity and innovation exercises (Berglund, Lindgren, & Packendorff, 2017). Here, teaching "through" entrepreneurship is identified, which, through its workshops, provides participants with opportunities to develop entrepreneurial skills. In addition to more traditional methods such as group dynamics and lectures adopted by the SEBRAE initiatives - **Growing and Undertaking** and **Awakening**, **IFA – Campaign Mode** innovates by adopting gamification tools, to encourage and reward participants. Rewarding points or badges is a way to motivate and create engagement among participants (Hamari, Koivisto, & Sarsa, 2014).

In terms of learning assessment, the three cases work similarly, adopting a Learning Diary (SEBRAE cases) and a questionnaire (**IFA – Campaign Mode**), in which participants write down doubts, solutions to challenges, lessons learned, and results achieved. Regarding results, in the two Sebrae cases, no information was obtained. Regarding **IFA – Campaign Mode**, there are reports, such as two participants who liked the project "because they saw that the group interacted a lot and obtained many different ideas and thoughts about the view of society" (IFA, 2020).

Analysis of EE cases at the ontological level

EE approaches configure the ontological level of Fayolle & Gailly (2008) and are discussed by several authors (Hoppe, 2016; Lackéus & Middleton, 2015; O'Connor, 2013), making it possible to compare the cases from this perspective. Figure 8 shows the classification according to the criteria: content, learning objectives, and methods used. It is more common for them to associate two approaches: "for" and "through", or "about" and "for" entrepreneurship. Two cases combine the three approaches: **Think Big** and **Awakening** (SEBRAE). Only one case - **IFA – Campaign Mode** was classified with an approach - "through" entrepreneurship, as it uses playful workshops focused on themes of training the individual as an entrepreneurial citizen (Hannon, 2005; Moberg, 2015). The cases with content "about" entrepreneurship, include topics such as the entrepreneur, his characteristics, his role in society, and entrepreneurship as a career option, as young people are at the moment of making career choices to enter the job market.

Organizations responsible for EE initiatives face some challenges, as the topic of entrepreneurship is not yet, in fact, included in the high school curriculum. Generally, its programs are offered as an extracurricular activity, during after-school hours, a format that is more accepted in private schools. In the public education network, after-school activities are generally offered to those with full education, such as ETECs in the state of São Paulo, schools in the SESI network, and federal technical schools. **EDUEMPRÈM**, offered by the LaSalle Network, is the only one that does not face this challenge as it is a private network.

	Initiative	**Workload**	**about**	**for**	**through**
BC	1. Mini company	52 hours/ 15 weeks		X	X
	2. JA StartUP	24 hours/ 8 weeks. Online: 3 hours		X	X
	3. InovaJovem	10 hours		X	X

	4. Think Big	60 hours	X	X	X
	5. EDUEMPRÈM	13 hours/ 13 weeks		X	X
EB	6. Growing and Undertaking (SEBRAE)	12 hours / 3 meetings	X	X	
	7. Awakening (SEBRAE)	44 hours/ 22 meetings	X	X	X
	8. IFA - Campaign Mode	10 hours/ 5 meetings			X

Figure 8. Classification of initiatives by approach.
Source: prepared by the authors.
BC: Business Creation. EB: Entrepreneurial Behavior.

Another challenging aspect is regional partnerships, with state departments or education councils, to operate across the entire public network of a given state. Negotiations are carried out separately between the organizations and government agencies. Training for teachers is a challenge that also deserves to be highlighted: organizations train teachers and other professionals who, in turn, disseminate the methodology. In the case of Junior Achievement, volunteers from partner companies are trained to apply the methodology in schools. And, in the cases of SEBRAE, training and teaching materials are offered to teachers.

With the publication of the New Secondary Education guidelines (MEC, 2018), schools began to search for solutions to meet the new curricular standards, being a factor in encouraging the relationship between these organizations and public and private education networks. Although the pandemic impacted the process of implementing the new high school curriculum, the organizations responsible for EE cases adapted their models to the new reality. All created online versions through applications that could be installed on cell phones or accessed by computers. In the case of SEBRAE, in 2020, Remote Entrepreneurship Workshops were created, offered with an intermediate workload (24 hours), compared to the other two from the same institution. IFA created an application to facilitate the workshop (**IFA – Campaign Mode**), allowing registration and access to instructors and participants. **JA Startup** was implemented in an online format, increasing the age of participants: from 15 to 24 years old. **InovaJovem** and **EDUEMPRÈM** were applied online in 2020 and the Telefonica Vivo Foundation created the Think Big Digital platform, a training trail aimed at young people and based on gamification.

Thus, the COVID-19 pandemic, according to some interviewees, boosted the development of online solutions that enable the participation of young people from all over Brazil.

Final considerations

The present research aimed to analyze cases of EE in high school from an ontological point of view - examining the levels of meaning "about", "for" and "through" entrepreneurship - and educational - learning objectives, target audience, contents, teaching-learning methods, evaluation methods, and recorded results.

The EE in high school is still little implemented in Brazil. Educational public policies included entrepreneurship as one of the structuring axes of secondary education in 2018, and the New Secondary Education Implementation Guide predicted the process of implementing changes for the beginning of 2020 (Brazil, 2018), delayed by the impacts of the pandemic. At the same time, as demonstrated, several independent initiatives operate in the country, offering solutions for students in public and private education networks, which can now be used and emulated to boost and disseminate

EE in secondary education.

The eight EE cases focused on high school education identified and analyzed in this research were divided into two groups: 1. "business creation" - with cases whose content involves the creation of a product, the management of a company, or the transformation of ideas into impact startups; 2. "entrepreneurial behavior" - formed by cases with more comprehensive content, including development of entrepreneurial skills, discussions and activities about business and the job market. The business creation group more frequently adopts project-based learning, business modeling, and mentoring, in addition to forms of evaluating results, in which criteria for evaluating and rewarding the solutions presented are established. The entrepreneurial behavior group uses experiential activities in groups and, in one case, challenges and gamification are adopted, with project-based learning being less frequent.

In terms of results, an opportunity is identified for all initiatives to use quantitative and/or qualitative models for evaluating results, whether concerning attitudes, behavior and/or entrepreneurial skills, in addition to intentions to open a business or knowledge of entrepreneurship, according to examples published in international literature (Kirkley, 2017; Peterman & Kennedy, 2003). This gap constitutes a contribution to the field of study, opening up opportunities for new research.

The study developed can contribute to the institutions responsible for the initiatives focused on, by allowing the comparison of similarities and differences, offering ideas and indications for improvement.

The mapping carried out and the analyses can serve as a reference for educational managers and professionals responsible for preparing the planning and implementing solutions for the topic of entrepreneurship in high school. Even though there are eight initiatives, compared to the size of the secondary education network, the experience of more than two decades of these independent initiatives can help the process of implementation and growth in educational institutions, as they are diverse references, both in approach, content, and methodologies.

As limitations, some aspects related to collection deserve to be mentioned. Due to the COVID-19 pandemic, data collection was made difficult as it was carried out during this period, when the organizations responsible for the initiatives were working remotely, adapting their formats to the new reality. Not all of them were able to provide the necessary information on time, and there were difficulties in subsequent contact to provide further information.

As future opportunities, we suggest studies that adopt methods such as action research, to make it possible to investigate the practice of one or more initiatives and allow the collection of data and perceptions from students, facilitators, teachers, and coordinators. Furthermore, given the lack of metrics for initiative results, quantitative studies can be carried out to measure the effects on participants.

Notes

1. Translation of the expression secondary schools, it is equivalent to high schools in Brazil. In this article, this translation will be used when the original text uses this expression.
2. In, 2019, InovaJovem already offered online workshops, in addition to in-person ones. In 2020, all initiatives adopted 100% online mode, due to the COVID-19 pandemic.
3. The English terms “hands-on” and “learning by doing” are present in EE literature as teaching methods used in practical activities (Hatak & Reiner, 2011).
4. Fab Labs: place for prototyping and innovation, for playing, learning, and creating (“The Fab Foundation,” 2022, Available at: https://fabfoundation.org/).
5. Pitch: brief presentation made by entrepreneurs about their product or service and company mission, aimed at potential investors (Marcovitch & Saes, 2018).

6. Demoday: name used for the day on which the final projects of participating students are presented.
7. Considering the pre-established criteria for the initiatives researched here and the data collection period, these versions were not included in this research.

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