Drivers for Entrepreneurship Education: Harnessing Innovation for Quality Youth Employment and Income Generation

DOI: 10.12776/qip.v28i1.1905

Fernanda de O. Silva, Maximilian Espuny, Ana C. F. Costa, Yadirka B. Anaya, Amanda M. Faria, Gilberto Santos, Otávio J. de Oliveira

Received: 2023-11-11 Accepted: 2024-03-14 Published: 2024-03-31

ABSTRACT

Purpose: This study proposes directions for developing Entrepreneurship Education (EE) based on innovation by identifying and grouping its driving elements. It intends to build entrepreneurial skills and capacities, enabling individuals to create and manage their businesses successfully.

Methodology/Approach: This work used the scientific method of Content Analysis to identify and analyse the EE-boosting elements in the literature.

Findings: Among this work's theoretical contributions, the theoretical articulation of EE with the Triple Helix sectors—universities, industry, and Government—stands out. These contributions support the advancement of the state of the art and the development of new research.

Research Limitation/Implication: Discuss deeper insights into EE elements and their applicability in various educational contexts.

Originality/Value of paper: The main contribution of this work was a more efficient interaction between public and private educational institutions, Non-Governmental Organizations, public agencies, and private companies, favouring innovation in the teaching-learning process and the insertion of young people into productive activities.

Category: Literature review

Keywords: entrepreneurship education; entrepreneurship; young people; employment and income; content analysis

1 INTRODUCTION

Entrepreneurship Education (EE) has gained prominence in global public policies primarily because it addresses socioeconomic challenges such as high youth unemployment exacerbated by the COVID-19 pandemic. Moreover, the pandemic has led to an 8.7 % rise in youth unemployment worldwide, thereby threatening the United Nations (UN) Sustainable Development Goal (SDG) 8, which aims for substantial employment growth for young people by 2030 (Espuny et al., 2021b; ILO, 2021; Nunhes et al., 2021).

In light of these challenges, EE is pivotal for nations' socioeconomic and technological progression (Hsu, Chao, and Chao, 2021). Consequently, public and private institutions worldwide are launching entrepreneurial education programs (EEP) to develop individuals and promote societal innovation. Developing individuals promoting innovation establishes a sustainable and dynamic entrepreneurial environment (Ahmed, Chandran, and Klobas, 2017; Barba-Sánchez and Atienza-Sahuquillo, 2016; Costa et al., 2018). These programs integrate entrepreneurship, planning, and management content within curricula across educational levels. Importantly, effective EE development demands collaboration between Academia, Companies, and Governments— a framework known as the 'Triple Helix' (TH) model, which fosters mutual benefits and expedites EE innovations (Etzkowitz and Zhou, 2017). Innovation (Zgodavova et al., 2020; Jimenez et al., 2019 Vieira et al., 2022) and management systems play an important role in this subject (Santos et al. 2017; Fonseca et al., 2022; Sá et al., 2023).

Under this framework, educational institutions can tailor content to market needs, enable companies to recruit educated candidates and, above all, empower governments to allocate public funds effectively, potentially leading to increased tax revenue (da Rocha et al., 2022).

Initiated historically by Harvard University in 1947, EEPs have increasingly been adopted to bolster students' business acumen, thus reducing reliance on formal employment (Nabi et al., 2017; Utami, Bernardus, and Sintha, 2017). Numerous studies have sought to enhance our understanding of EE. Notable examples include Nabi et al. (2017), who examined EE's impact on higher education; Kraus et al. (2019), who explored digital entrepreneurship teaching; Newman et al. (2019), who focused on entrepreneurial self-efficacy; Brüne and Lutz (2020), who assessed entrepreneurship education for children and adolescents; and Yi and Duval-Couetil (2021), who evaluated EE course assessment methods.

Despite these contributions, a research gap remains regarding integrating EE with modern-day concepts, such as sustainability, information technology, and innovation (Loi, Castriotta, and Di Guardo, 2016). Thus, this study is guided by the question: how can EE be developed to alleviate unemployment and stimulate income generation among youth? To address this critical issue, the study aims to propose drivers—grounded in recommendations from Academia, Governments, Companies, and NGOs—for enhancing EE. This article includes sections on the

theoretical framework (2), research method (3), development (4), results and discussion (5), conclusion (6) and references.

2 THEORETICAL FRAMEWORK

Successful business creation exerts a positive societal influence, generating wealth, technological advancement, innovation, and new jobs, thereby enhancing social and economic conditions (Premand et al., 2016; Caliendo, Goethner, and Weißenberger, 2020; Soares et al., 2021).

Entrepreneurs then identify market niches and undertake substantial risks to achieve personal and financial fulfilment (Karimi et al., 2016). For this reason, achieving sustainability and success requires careful planning throughout all stages of the business plan, including opportunity identification, venture development, and feasibility analysis (Premand et al., 2016; Newman et al., 2019).

Subsequently, Entrepreneurship Education (EE) targets the development of entrepreneurial traits, including leadership, business communication, and risk management. Public and private institutions impart this education through Entrepreneurial Education Programs (EEP) (Bischoff, Volkmann, and Audretsch, 2018; Santos, Neumeyer, and Morris, 2019). Thus, EE is critical in cultivating both traditional and innovative business endeavours. It fosters an Entrepreneurial Mindset (EM), equipping students with tools, experiences, and analytical methods to support new venture creation (Ahmed, Chandran, and Klobas, 2017; Costa et al., 2018; Huq and Gilbert, 2017).

EE curricula should incorporate pedagogical disciplines and methods that nurture entrepreneurial behaviours, enhancing the likelihood of student venture creation (Nabi et al., 2017, 2018; Boldureanu et al., 2018). EE can be associated with the generation of traditional and innovative businesses and focuses on developing an entrepreneurial mindset (EM), providing tools, sharing experiences, and presenting analysis methods to students to support the opening of their businesses (Ahmed; Chandran; Klobas, 2016; Costa et al., 2018). In debates about economic development and innovation, it appears as a mechanism capable of promoting disruptive social changes and increasing the volume of investment allocation in regions and enterprises engaged with its process (Bell, 2016). Despite often having higher education levels than men, women face significant barriers in entrepreneurship, including credit access discrimination and a lack of positive role models (Westhead and Solesvik, 2016; Strawser, Hechavarría, and Passerini, 2021).

Integration of EE within secondary, higher, and vocational institutions can include theory and practical subjects in curricula, entrepreneurial workshops, and business events promotion (Boldureanu et al., 2018; Wach and Wojciechowski, 2016). Properly structured courses cultivate entrepreneurial skills and competencies, encouraging students to initiate businesses and contributing to income distribution, job creation, and technological innovation (Farhangmehr, Gonçalves, and

Sarmento, 2016; Zollo et al., 2017). Effective EEPs must respect students' diverse cultural, social, and economic backgrounds (Thrane et al., 2016; Welsh, Tullar, and Nemati, 2016). This entails exposing students to entrepreneurial concepts, providing helpful business tools, and encouraging engagement with entrepreneurial situations (Nowiński et al., 2019; Robinson et al., 2016).

In teaching EE, constructivist approaches, where students actively engage in the learning process, should be favoured over behaviourist models that primarily involve passive learning (Nabi et al., 2017). On an individual level, Entrepreneurial Intention (EI) is noteworthy, indicating an individual's potential to adopt entrepreneurial behaviours (Karimi et al., 2016; Maresch et al., 2016). EI, the mindset driving an individual towards entrepreneurship, is influenced significantly by educators. Thus, educators must share success stories and inspire their students towards entrepreneurship, as negative experiences can dissuade them from entrepreneurial pursuits (Newman et al., 2019; Robinson et al., 2016).

3 METHODOLOGY

This section presents the research method used in the work, which was developed based on the Scientific Method of Content Analysis, with the aim that the researcher can both investigate and evaluate the information in the selected documents (Bengtsson, 2016; Elo et al., 2014; Jupp, 2006). Content analysis allows for the development of analyses and relevant proposals on the subject studied, with this work focusing on the proposition of drivers for EE (Moldavska and Welo, 2017). Figure 1 presents the methodological flow of this research.

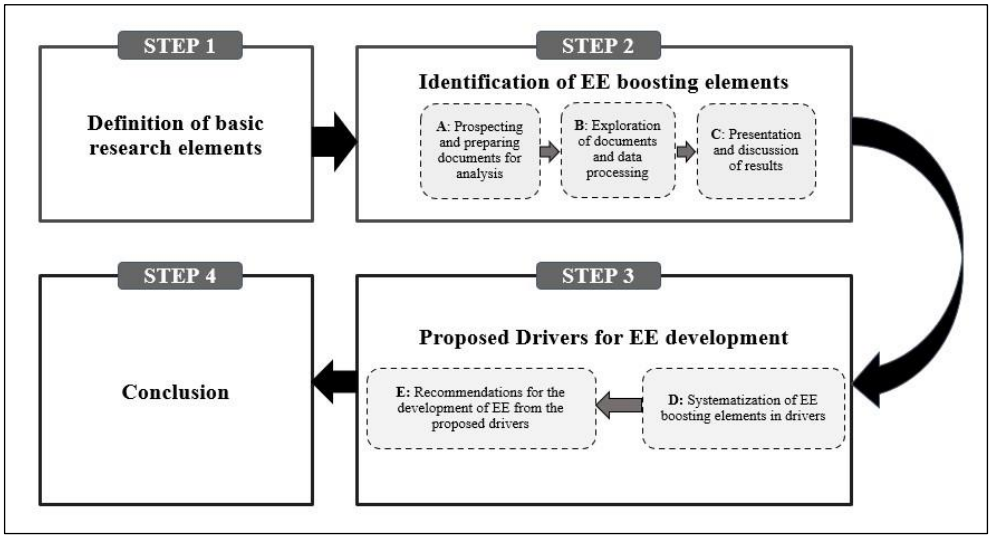

Figure 1 – Methodological Flow

The scientific method used in this work was composed of four steps: (I) definition of essential research elements; (II) identification of the EE boosting elements dimensions, according to the TH sectors; (III) proposition of drivers for EE development; and (IV) elaboration of the conclusion.

In Stage I, the theme, research question, objectives, and scientific method were defined. The procedures used for the development of this work were a systematic literature review and content analysis. The systematic review contributed to clarifying the research question based on a detailed analysis of scientific articles. The content analysis made it possible to identify the frequency of EE elements through the documents selected for this work, and from that, one can understand and explore the theme in depth (Jupp, 2006).

In Step II, the elements identified in the literature on EE were systematised and organised through content analysis (Belkind, 2021; Kothari and Garg, 2019). This phase had three stages: prospection and preparation of documents for analysis (Stage A), exploration of documents and data processing (Stage B), and discussion of the results (Stage C). In stage A, the 30 most cited articles on the topic were identified for carrying out the work (Appendix A). For this, "entrepreneurship education" was used as the search term, only in the title in the Scopus database. This database was chosen because it is the most comprehensive on this topic, enabling the identification of works published in several relevant journals (Mongeon and Paul-Hus, 2016). The selected articles were from 2016 to 2020 since, in this interval, the previous publications are already dense in this field of study. Only journal articles were considered, as this type of publication has already been peer-reviewed, thus presenting more excellent reliability. In this selection, publications in the English language were also chosen because it is the most used and most influential language in the academic environment (Oliveira, Silva, Juliani, Barbosa, and Nunhes, 2019). After using the parameters described, 659 scientific documents were obtained using the following query: TITLE ("entrepreneurship", "education") AND PUBYEAR > 2015 AND PUBYEAR < 2021 AND (LIMIT-TO (DOCTYPE , "ar")) AND (LIMIT-TO (LANGUAGE, "English") OR LIMIT-TO (LANGUAGE , "j")). In Stage B, the most frequent items in the scientific literature on EE were mapped, containing at least two notes, in two different articles. Thus, 33 elements were identified, considering key terms as elements. In Stage C, the elements were analysed and categorised deductively because a pre-existing matrix (Elo et al., 2014) was used, in this case, according to their TH characteristics, both in single dimensions (Academy, Corporate, and Government) and in dimensions that contained two sectors (Academy/Corporate, Academy/Government, and Corporate/Government) or all sectors of TH (Academy/Corporate/Government).

In Step III, the elements were analysed and structured inductively into five EE drivers, according to Stage D. The structuring of the drivers considered the affinity between the aspects of the previous stages (Belkind, 2021; Elo et al., 2014). The drivers that contribute to the consolidation of new insights and the development of EE were discussed. In Stage E, each pillar supported the elaboration of recommendations to be implemented in educational institutions, Governments, companies, and NGOs, contributing to improving and developing entrepreneurship education. In conclusion (Step IV), the fulfilment of the proposed objectives, the most relevant findings, and the research contributions were

analysed. Finally, suggestions were made for future studies to expand the results and contribute to the advancement of the EE area.

4 IDENTIFICATION OF EE BOOSTING ELEMENTS

In this section, the EE elements were identified in the 30 most cited scientific articles in the Scopus database, as shown in Table 1. The elements were organised by the total frequency stated in the articles and classified in the TH dimensions as proposed by Etzkowitz and Leydesdorff (2000) (Etzkowitz and Leydesdorff, 2000).

TH is formed by the interaction between academia-business-government sectors so that the interactions between them are generated, mainly through innovation and synergy, which can improve organisations' performance (Etzkowitz and Leydesdorff, 2000). In this way, each TH sector collaborates with the others, and the academy acts as a source of ideas in a knowledge-based society, creating solutions for companies and governments to overcome socioeconomic challenges. The companies are critical actors in agriculture, production, trade, and provision of services and act in developing training for their human resources. Governments act as guarantors of contracts and partnerships, assuming risks and promoting the feasibility of sectoral innovation projects through financial and structural resources (Etzkowitz and Zhou, 2017).

According to the Appendix, 27.27% of the elements were classified as Corporate/Government, 24.24% as Academy, 15.15% as Academy/Corporate/Government, 12.12% as Government, 12.12% as Academy/Corporate, 6.06% as Corporate, and 3.03% as Academy/Government.

The elements classified simultaneously in the Corporate/Government dimensions are related to the social well-being provided by the economic development in the communities ("Employment," "Economy," "Quality of life," and "Entrepreneurial environment" and "Technological support"); the social and environmental protection network ("Social Aspects," "Psychological Impact", "Sustainability") and the importance of entrepreneurship for reducing poverty ("NGOs" and "Social Entrepreneurship"). The joint work of companies and governments can positively impact society, reducing unemployment, social inequality, and hunger (Davies, Haugh, and Chambers, 2019; Mandel and Noyes, 2016).

The elements classified in the Academy dimension involve the EE with the structures of each educational level of the EE ("Childhood Entrepreneurship," "High School," and "Higher Education") and the theoretical development that serves as a basis for preparing teachers of the subjects of EE ("Entrepreneurship Education," "Learning Styles," "Educational Trainers," "Support Disciplines" and "Theory of Entrepreneurship"). Thus, the Academy dimension should contribute to aligning EE with the business training needs of fundamental, technical, and higher education levels (Jones, Pickernell, Fisher, and Netana, 2017).

The elements classified in the Academy/Corporate/Government dimensions aim to overcome complex problems in society, requiring the assistance of entrepreneurs and other stakeholders to solve them, such as the creation of zero carbon businesses, internet accessibility in regions of difficult access, and combat to hunger in the vulnerable areas ("Technological support," "R&D," "Benefits of entrepreneurship," "Intersectoral partnerships," and "Collaborative network"). Therefore, EE becomes important to direct entrepreneurship on the route of environmental, social, and economic solutions, with the support of the three sectors of TH. In this way, academia must contribute to the production of patents and research aimed at increasing and improving the performance of enterprises; companies must share innovative technologies and the technical training of high-performing professionals; and governments should subsidise financial and material resources for the construction/provision of incubators (Bischoff et al., 2018; Johannisson, 2016).

The elements classified in the Academy/Corporate dimensions include actions to transform projects into ventures ("Business ideas") and training and tools for business improvement and development ("Entrepreneurial skills," "Training and qualification," and "Management tools"). These elements are essential for EI to drive ideas, projects, and social and market demands in business (Vodă and Florea, 2019).

The elements classified in the Corporate dimension aim to improve business strategies and tactics ("Business Strategies" and "Business Entrepreneurship") so that enterprises can be prosperous and long-lived (Bischoff et al., 2018). Finally, the only element classified in the Academy/Government dimension was "Funding Funds," which indicates the need for development funds to constantly invest in research on EE so that this field of knowledge does not become obsolete (Bischoff et al., 2018; Utami, 2017).

5 PROPOSED DRIVERS FOR EE DEVELOPMENT

As presented in the method, 33 EE driving elements were identified in the 30 most cited EE articles from 2016 to 2020. The elements were grouped by affinity and supported the development of five EE drivers. Figure 2 shows the affinity associations between the elements that form each driver. These drivers are transversal to TH's three sectors, as Etzkowitz and Leydesdorff (2000) highlighted. The five drivers originated from the organisation of the driving elements: sustainable development, teaching and learning practices, entrepreneurial action, institutional and governmental support for entrepreneurship, and management of technology and innovation.

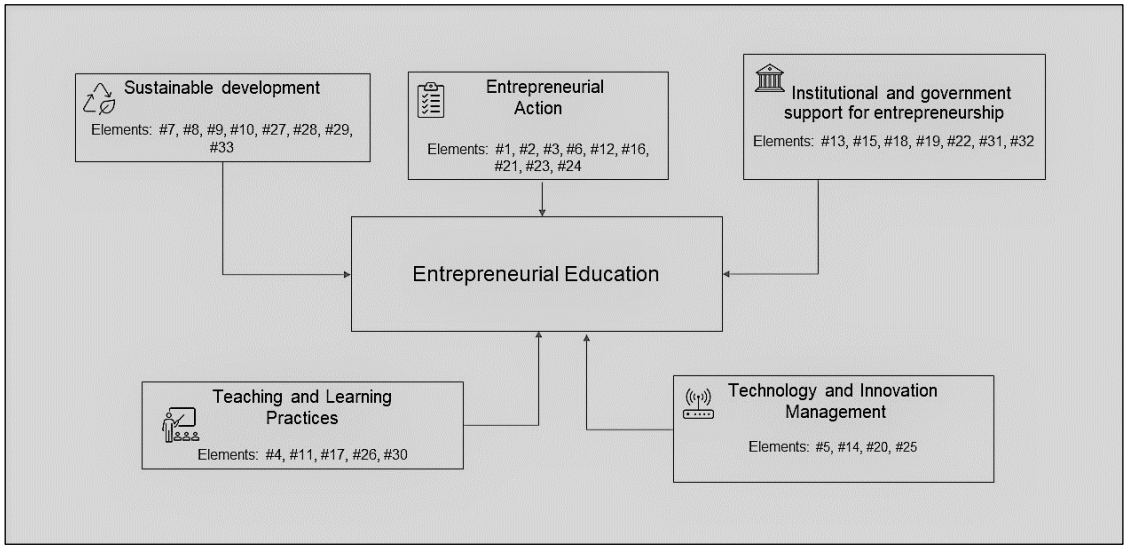

Figure 2 – Systematisation of EE Boosting Elements in Drivers

These drivers are necessary to support EE and standardise and enable the implementation of entrepreneurship courses in educational institutions of all levels, comprising primary education, technical education, and higher education. Through them, it is possible to expand the benefits of EE, generating improvements in the socioeconomic conditions of young people. Each of the drivers has a relationship with the others, in which the development of one influences the others. This discussion enabled the elaboration of recommendations contained in the drivers for the formulators of courses and entrepreneurship policies, allowing progress in the art state of EE.

5.1 Sustainable Development

Sustainable development, initiated in 1987, focuses on economic, environmental, and social aspects (Elkington, 1994; Nunhes et al., 2022; United Nations, 1987). Rising climate awareness has driven companies to adopt socially responsible and sustainable business models, influencing entrepreneurship courses to include environmental regulations and innovative practices (#33) (Araujo et al., 2021; Ahmed et al., 2020; Mindt and Rieckmann, 2017; Obschonka and Stuetzer, 2017).

The COVID-19 pandemic exacerbated youth unemployment and informal work globally (Espuny et al., 2021a; Wesseling, 2021). Governments should promote self-employment as a quick solution to unemployment, complemented by psychological support from educational institutions for entrepreneurial activities (#9, #27, #29, #8) (Alvarenga et al., 2021; Bergmann, Hundt, and Sternberg, 2016; Turner and Gianiodis, 2018).

Women face more significant barriers in entrepreneurship (Entrialgo and Iglesias, 2016; Rudhumbu et al., 2020). Organisations like the OECD aim to improve

female participation in entrepreneurship courses and initiatives (#28) (Westhead and Solesvik, 2016; Villalobos Rodríguez et al., 2021).

Associations should collaborate with global organisations to foster sustainable education (#7, #33) (Hagebakken, Reimers, and Solstad, 2021; Purzer, Fila, and Nataraja, 2016). Governments should facilitate programs that empower young women through digital marketing and crisis management (#28) (Rudhumbu et al., 2020; Salavou et al., 2021).

Finally, NGOs should coordinate community-oriented projects involving students in activities like fundraising and cultural workshops to build entrepreneurial skills (#27, #10, #8) (Carvalho et al., 2020). These collective efforts aim to foster sustainability, reduce unemployment, and enable inclusive entrepreneurship.

To foster sustainable and innovative trends, associations should collaborate with global organisations that play a crucial role in creating a conducive environment for such collaborations, as partnerships with international organisations can amplify the impact of innovation, facilitating the exchange of ideas and resources (Hagebakken et al., 2021). Governments should empower young women through workshops on digital marketing and leadership (Rudhumbu et al., 2020; Salavou et al., 2021). Lastly, NGOs can partner with institutions for community projects that develop essential entrepreneurial skills (Carvalho et al., 2020).

5.2 Teaching and Learning Practices

Effective teaching in Entrepreneurial Education (EE) hinges on the educational environment, well-prepared educators, and relevant content (Cualheta and Abbad, 2021). Governments should integrate entrepreneurship subjects into secondary and higher education curricula to foster an Entrepreneurial Mindset (EM) (#2) (Çera et al., 2021). Educators need ongoing training to employ updated teaching methodologies and technology, thereby positively impacting students' Entrepreneurial Intentions (EI) (#6, #12) (Ilonen, 2021).

Course content should equip students with foundational concepts and skills to navigate market uncertainties (#24, #3) (Boldureanu et al., 2018; Cualheta and Abbad, 2021). Topics should cover marketing, sales, finance, human resources, and technology innovation, enhancing EI in the short term (#16) (Costa et al., 2018; Duval-Couetil, Shartrand, and Reed, 2016; Utami, 2017).

Schools and universities should collaborate with companies for short-term internships (#1) (Blankesteijn, Bossink, and Sijde, 2021) and offer sustainability-focused entrepreneurship courses covering circular economy, Sustainable Development Goals, and environmental management (#21) (Bolzani et al., 2021; Hsu and Pivec, 2021; Liang, Wang, and Hong, 2021; Rudhumbu et al., 2020).

Basic education can include business fundamentals through board games and supervised activities (Cárdenas-Gutiérrez, Bernal-Guerrero, and Montoro-Fernández, 2021), while technical and higher education should integrate extracurricular projects like mini-companies. These initiatives will cultivate an

innovative mindset, preparing them to navigate the ever-evolving landscape of the professional world. (#1, #21) (Almeida, Daniel, and Figueiredo, 2019; Fearon et al., 2021). As for NGOs, they should take advantage of the entrepreneurial experience of their staff to educate young people without formal access to entrepreneurial learning (#23) (Liu et al., 2020).

5.3 Entrepreneurial Action

Entrepreneurship encompasses three key categories: child and youth entrepreneurship, business entrepreneurship, and social entrepreneurship. The focus on children and youth in EE fosters individual creativity while developing technical and emotional skills from a young age (#30) (Alam, 2019; Passaro, Quinto, and Thomas, 2018). Business entrepreneurship should aim to introduce real-world market challenges into the educational environment, including customer satisfaction, competitor pressure, and market dynamics (#11) (Belitski and Heron, 2017; Costa et al., 2018). Social entrepreneurship seeks to improve societal conditions through actions led by workers, students, and community members. Thus, educational institutions should promote student involvement in social initiatives, offering credits for extracurricular activities in higher education (#26) (Barton, Schaefer, and Canavati, 2018).

Governments are advised to partner with educational institutions to form social enterprises, enabling community-focused extension activities (#4, #26) (Wu et al., 2022). Schools should also consider inviting micro and small business owners to share their experiences, enriching students' perspectives (#4) (Dewan and Singh, 2017). Companies can facilitate competitions, providing young people with opportunities to meet market demands through innovative problem-solving (#17) (Li, 2021).

5.4 Institutional and Governmental Support to Entrepreneurship

Governments should streamline bureaucracy to enable entrepreneurs to easily navigate legal requirements such as labour legislation and business licenses, thereby avoiding penalties (#13, #31) (Kallas and Parts, 2021). Overcomplicated laws hinder entrepreneurship, discouraging business ventures (#15) (Bergmann, Hundt, and Sternberg, 2016; Jones et al., 2017). Quality infrastructure for educational institutions is essential for practical training. Elective courses like financial education and entrepreneurship should be introduced in primary education to develop entrepreneurial skills (#13).

In higher education, corporate partnerships are essential. Companies can share real-world challenges with students, who, in return, offer innovative solutions. This reciprocal relationship benefits companies by giving them access to emerging talent (#19) (Bergmann, Hundt, and Sternberg, 2016; Bezanilla et al., 2020; Iglesias-Sánchez et al., 2016).

Governments should fund R&D and offer financial incentives for student-led entrepreneurial initiatives. This supports EE and fosters economically and socially impactful ventures (#18) (Belitski and Heron, 2017). Particular attention should be paid to funding women-led businesses and developing networks for female entrepreneurs (#22) (Rudhumbu et al., 2020; Salavou et al., 2021).

NGOs can contribute by developing business-centric entrepreneurship courses and flexible curricula aimed at empowering individuals to execute social projects. NGOs focusing on business entrepreneurship should collaborate with those operating in other social sectors like recycling and cultural promotion. They can offer specialised courses, training, and crisis support (#32) (Akhmetshin et al., 2018; Carvalho et al., 2020; Fayolle, Verzat and Wapshott, 2016). A more entrepreneurially conducive environment can be created by emphasising legal compliance, quality education, corporate partnerships, specialised funding, and NGO collaboration.

5.6 Technology and Innovation Management

To promote quality EE courses, it is recommended that governments and educational institutions develop innovative research and technologies, adapting teaching to market demands and trends to contribute to the training of students who have high innovative potential (#5) (Bergmann, Hundt, and Sternberg, 2016; Costa, Santos, and Oliveira, 2021; Reis et al., 2020). In addition, including technologies in entrepreneurship courses is recommended to bring students closer to the reality of business, forming individuals who master the elaboration of business strategies and management tools, providing competitive advantages to the businesses that will be led by these students (#14) (Duval-Couetil, Shartrand, and Reed, 2016). In this sense, educational institutions should teach tools such as SWOT, GUT, and 5W2H analysis in EE, allowing the realisation of business planning and, thus, increasing the chances for the management and execution of processes to be more successful (#25) (Newman et al. 2019; Premand et al., 2016). Finally, educational institutions are also recommended to constantly update their curricula to integrate EE teaching with technological tools, such as games and reality simulations aimed at entrepreneurial activities; and market trends, with the aim that EE is constantly contextualised, including in its role the specificities demanded by new businesses that may arise (#20) (Hsu and Pivec, 2021; Liang, Wang, and Hong, 2021; Mura et al., 2018; Rudhumbu et al., 2020).

6 CONCLUSION

This study successfully proposed drivers by identifying and clustering the driving elements of EE, thereby achieving its primary objective. The research question was answered. It also provided an elaboration of drivers with recommendations to educational institutions, governments, companies, and NGOs. This is anticipated to positively reduce unemployment and generate income among young people. Furthermore, the effect caused by the innovation presented in this research will

contribute to economic growth, promoting the competitiveness of companies in the global market and contributing to the sustainable development of enterprises.

Significantly, the critical scientific contribution of this work lies in the theoretical articulation of EE with the TH sectors. This not only advances the current state of the art but also lays the groundwork for future research. From a practical standpoint, this work serves multiple purposes: it enhances the quality of entrepreneurship courses, facilitates the integration of youth into productive activities, and innovates the teaching-learning process. Furthermore, it fosters more efficient collaborations between stakeholders, including public and private educational institutions, NGOs, public agencies, and private companies.

It is essential to recognise the limitations of this work when selecting articles in which the most cited were prioritised. Therefore, for future studies, it is suggested that works consider other article selection methods and use different types of documents, such as national laws and regulations, policies and initiatives developed by governmental and non-governmental institutions, educational institutions, and start-ups so that more recommendations can be proposed and even the systematisation of new drivers. Studies on EEPs in rural areas are recommended, primarily aimed at young people without access to formal education, people with no or low schooling, and/or at improving entrepreneurs who already carry out their activities. Finally, it is suggested to carry out studies that analyse the relationship between EE and social and economic indicators of different countries in different regions of the world.

ACKNOWLEDGEMENTS

This work was supported by the Coordenação de Aperfeiçoamento de Pessoal de Nível Superior - Brasil (CAPES) - Finance Code 001, the São Paulo Research Foundation (FAPESP) [grant number 2019/06077-1] and by the Brazilian National Council for Scientific and Technological Development (CNPq) [grant number PQ 312538/2020-0].

APPENDIX

Table A1 – List of Top 30 (1-10) Articles- Continue

Elements	*Autohrs / Triple Helix Elements*	*Nabi et al., (2017)*	*Karimi et al. (2016)*	*Maresch et al., (2016)*	*Walter and Block, (2016)*	*Barba-Sánchez and Atienza-Sahuquillo, (2018)*	*Nabi et al. (2018)*	*Westhead and Solesvik (2016)*	*Bergmann, Hundt and Sternberg (2016)*	*Premand et al. (2016)*	*Newman et al. (2019)*	*Frequency*	*Frequency Acumulate*
Intersectoral Partnerships (#18)	A / C / G						x	x	x			*3*	*3*
Collaborative Network (#19)	A / C / G								x	x		*2*	*2*
Technological Support (#20)	A /C / G											*0*	*0*
High School Education (#21)	A	x	x		x	x			x	x	x	*7*	*7*
Financing Funds (#22)	A / G							x		x		*2*	*2*
Training and Qualification (#23)	A / C									x		*1*	*1*
Entrepreneurship Theory (#24)	A								x	x		*2*	*2*
Management Tools (#25)	A / C									x		*1*	*1*
Social Entrepreneurship (#26)	C / G											*0*	*0*
Social Aspects (#27)	C / G							x				*1*	*1*
Women Incentive Policies (#28)	G							x				*1*	*1*
Quality of Life (#29)	C / G											*0*	*0*
Child Entrepreneurship (#30)	A											*0*	*0*
Public Policy (#31)	G				x					x		*2*	*2*
NGO (#32)	C / G											*0*	*0*
Sustainability (#33)	C / G											*0*	*0*

Table A1 – List of Top 30 (1-10) Articles

Elements	*Autohrs / Triple Helix Elements*	*Nabi et al., (2017)*	*Karimi et al. (2016)*	*Maresch et al., (2016)*	*Walter and Block, (2016)*	*Barba-Sánchez and Atienza-Sahuquillo, (2018)*	*Nabi et al. (2018)*	*Westhead and Solesvik (2016)*	*Bergmann, Hundt and Sternberg (2016)*	*Premand et al. (2016)*	*Newman et al. (2019)*	*Frequency*	*Frequency Acumulate*
Intersectoral Partnerships (#18)	A / C / G						x	x	x			*3*	*3*
Collaborative Network (#19)	A / C / G								x	x		*2*	*2*
Technological Support (#20)	A /C / G											*0*	*0*
High School Education (#21)	A	x	x		x	x			x	x	x	*7*	*7*
Financing Funds (#22)	A / G							x		x		*2*	*2*
Training and Qualification (#23)	A / C									x		*1*	*1*
Entrepreneurship Theory (#24)	A								x	x		*2*	*2*
Management Tools (#25)	A / C									x		*1*	*1*
Social Entrepreneurship (#26)	C / G											*0*	*0*
Social Aspects (#27)	C / G							x				*1*	*1*
Women Incentive Policies (#28)	G							x				*1*	*1*
Quality of Life (#29)	C / G											*0*	*0*
Child Entrepreneurship (#30)	A											*0*	*0*
Public Policy (#31)	G				x					x		*2*	*2*
NGO (#32)	C / G											*0*	*0*
Sustainability (#33)	C / G											*0*	*0*

Table A2 – List of Top 30 (11-20) Articles- Continue

Elements (#)	*Autohrs / Triple Helix Elements*	*Fayolle, Verzat and Wapshott (2016)*	*Robinson et al. (2016)*	*Duval-Couetil, Shartrand and Reed, (2016)*	*Obschonka and Stuetzer (2017)*	*Entrialgo and Iglesias (2016)*	*Kraus et al. (2019)*	*Nowiński et al. (2019)*	*Passaro, Quinto and Thomas (2018)*	*Akhmetshin et al. (2018)*	*Mandel and Noyes (2016)*	*Frequency*	*Frequency Acumulate (TA1+TA2)*
Higher Education (#1)	A	x	x	x	x	x	x	x	x	x	x	*10*	*20*
EE (#2)	A	x	x	x	x	x	x	x	x	x	x	*10*	*20*
Entrepreneurial skills (#3)	A / C	x	x	x	x	x	x	x	x	x	x	*10*	*20*
Entrepreneurial Environment (#4)	C / G	x		x	x	x	x	x	x		x	*8*	*18*
P&D (#5)	A / C / G	x	x	x	x	x	x	x	x	x	x	*10*	*18*
Learning Styles (#6)	A	x	x	x	x	x	x	x	x	x	x	*10*	*17*
Economy (#7)	C / G	x	x	x	x	x	x	x	x	x	x	*10*	*19*
Psychological Impact (#8)	C / G	x	x		x	x	x	x		x	x	*8*	*17*
Employment (#9)	C / G		x	x				x		x	x	*5*	*15*
Benefits of Entrepreneurship (10#)	A / C / G		x	x	x		x	x	x	x	x	*8*	*14*
Business Entrepreneurship (#11)	C	x	x	x	x	x	x	x	x	x	x	*10*	*14*
Educational Trainers (#12)	A	x	x	x		x		x	x	x	x	*8*	*14*
Public Institutions (#13)	G	x	x			x	x	x		x	x	*7*	*15*
Business Strategies (#14)	C		x	x	x		x	x	x		x	*7*	*9*
Regulations (#15)	G			x	x	x	x	x		x	x	*7*	*9*
Support Disciplines (#16)	A		x	x	x	x	x					*5*	*8*
Business Ideas (#17)	A / C		x	x	x		x	x			x	*6*	*7*

Table A2 – List of Top 30 (11-20) Articles

Elements (#)	*Autohrs / Triple Helix Elements*	*Fayolle, Verzat and Wapshott (2016)*	*Robinson et al. (2016)*	*Duval-Couetil, Shartrand and Reed, (2016)*	*Obschonka and Stuetzer (2017)*	*Entrialgo and Iglesias (2016)*	*Kraus et al. (2019)*	*Nowiński et al. (2019)*	*Passaro, Quinto and Thomas (2018)*	*Akhmetshin et al. (2018)*	*Mandel and Noyes (2016)*	*Frequency*	*Frequency Acumulate (TA1+TA2)*
Intersectoral Partnerships (#18)	A / C / G		x		x	x	x		x	x	x	*7*	*10*
Collaborative Network (#19)	A / C / G			x	x		x				x	*4*	*6*
Technological Support (#20)	A /C / G			x	x	x	x	x		x	x	*7*	*7*
High School Education (#21)	A	x						x				*2*	*9*
Financing Funds (#22)	A / G		x	x			x			x	x	*5*	*7*
Training and Qualification (#23)	A / C				x			x		x	x	*4*	*5*
Entrepreneurship Theory (#24)	A			x	x	x	x	x				*5*	*7*
Management Tools (#25)	A / C			x				x				*2*	*3*
Social Entrepreneurship (#26)	C / G			x	x		x			x		*4*	*4*
Social Aspects (#27)	C / G			x		x				x		*3*	*4*
Women Incentive Policies (#28)	G				x	x	x	x				*4*	*5*
Quality of Life (#29)	C / G						x			x		*2*	*2*
Child Entrepreneurship (#30)	A				x						x	*2*	*2*
Public Policy (#31)	G							x		x		*2*	*4*
NGO (#32)	C / G									x	x	*2*	*2*
Sustainability (#33)	C / G		x							x		*2*	*2*

Table A3 – List of Top 30 (21-30) Articles- Continue

Elements (#)	*Autohrs / Triple Helix Elements*	*Johannisson (2016)*	*Iglesias-Sánchez et al. (2016)*	*Welsh, Tullar and Nemati (2016)*	*Huq and Gilbert (2017)*	*Scott, Penaluna and Thompson (2016)*	*Purzer, Fila and Nataraja (2016)*	*Belitski and Heron (2017)*	*Thrane et al. (2016)*	*Wach and Wojciechowski (2016)*	*Turner and Gianiodis (2018)*	*Frequency*	*Frequency Acumulate (TA2+TA3)*
Higher Education (#1)	A	x	x	x	x	x	x	x	x	x	x	*10*	*30*
EE (#2)	A	x	x	x	x	x	x	x	x	x	x	*10*	*30*
Entrepreneurial skills (#3)	A / C	x	x	x	x	x	x	x	x	x	x	*10*	*30*
Entrepreneurial Environment (#4)	C / G	x	x	x	x	x	x	x	x	x	x	*10*	*28*
P&D (#5)	A / C / G	x	x	x	x	x	x	x	x		x	*8*	*26*
Learning Styles (#6)	A	x	x	x	x	x	x	x	x	x	x	*7*	*24*
Economy (#7)	C / G	x	x	x			x	x	x	x	x	*9*	*28*
Psychological Impact (#8)	C / G	x	x	x	x	x	x	x			x	*9*	*28*
Employment (#9)	C / G	x	x		x	x	x	x	x	x	x	*10*	*25*
Benefits of Entrepreneurship (10#)	A / C / G	x	x	x	x		x	x	x	x	x	*6*	*20*
Business Entrepreneurship (#11)	C	x	x		x	x	x	x	x	x		*4*	*18*
Educational Trainers (#12)	A	x	x		x	x	x	x	x	x		*6*	*20*
Public Institutions (#13)	G	x	x	x		x		x		x	x	*8*	*23*
Business Strategies (#14)	C	x	x	x	x	x	x	x	x		x	*2*	*11*
Regulations (#15)	G	x	x	x	x			x	x	x	x	*2*	*11*
Support Disciplines (#16)	A	x	x	x		x			x	x	x	*3*	*11*
Business Ideas (#17)	A / C	x			x	x	x		x	x	x	*1*	*8*

Table A3 – List of Top 30 (21-30) Articles

Elements (#)	*Autohrs / Triple Helix Elements*	*Johannisson (2016)*	*Iglesias-Sánchez et al. (2016)*	*Welsh, Tullar and Nemati (2016)*	*Huq and Gilbert (2017)*	*Scott, Penaluna and Thompson (2016)*	*Purzer, Fila and Nataraja (2016)*	*Belitski and Heron (2017)*	*Thrane et al. (2016)*	*Wach and Wojciechowski*	*Turner and Gianiodis (2018)*	*Frequency*	*Frequency Acumulate*
Intersectoral Partnerships (#18)	A / C / G	x			x		x	x				*3*	*13*
Collaborative Network (#19)	A / C / G	x		x			x	x	x		x	*2*	*8*
Technological Support (#20)	A /C / G	x		x	x	x	x		x			*0*	*7*
High School Education (#21)	A	x	x	x								*7*	*16*
Financing Funds (#22)	A / G	x						x	x		x	*2*	*9*
Training and Qualification (#23)	A / C				x			x	x		x	*1*	*6*
Entrepreneurship Theory (#24)	A			x						x		*2*	*9*
Management Tools (#25)	A / C	x				x	x		x			*1*	*4*
Social Entrepreneurship (#26)	C / G	x				x			x	x		*0*	*4*
Social Aspects (#27)	C / G	x								x		*1*	*5*
Women Incentive Policies (#28)	G											*1*	*6*
Quality of Life (#29)	C / G				x						x	*0*	*2*
Child Entrepreneurship (#30)	A	x										*0*	*2*
Public Policy (#31)	G											*2*	*6*
NGO (#32)	C / G											*0*	*2*
Sustainability (#33)	C / G											*0*	*2*

REFERENCES

Ahmed, T., Chandran, V.G.R. and Klobas, J., 2017. Specialised Entrepreneurship Education: Does It Really Matter? Fresh Evidence from Pakistan. *International Journal of Entrepreneurial Behaviour and Research*, [e-journal] 23(1), pp.4-19. https://doi.org/10.1108/IJEBR-01-2016-0005.

Ahmed, T., Chandran, V.G.R., Klobas, J.E., Liñán, F. and Kokkalis, P., 2020. Entrepreneurship Education Programmes: How Learning, Inspiration and Resources Affect Intentions for New Venture Creation in a Developing Economy. *International Journal of Management Education*, [e-journal] 18(1), p.100327. https://doi.org/10.1016/j.ijme.2019.100327.

Akhmetshin, E.M., Kovalenko, K.E., Goloshchapova, L.V., Polyakova, A.G., Erzinkyan, E.A. and Murzagalina, G.M., 2018. Approaches to Social Entrepreneurship in Russia and Foreign Countries. *Journal of Entrepreneurship Education*, [e-journal] 21(Special Issue 2), pp.1-7.

Alam, A., 2019. Youth Entrepreneurship: Concepts and Evidence. February Issue Brief. [February], pp.1-7. UNICEF Office of Global Insight and Policy. https://www.unicef.org/media/72406/file/Youth-entrepreneurship-concepts-and-evidence-issue-brief-2019.pdf.

Almeida, J., Daniel, A.D. and Figueiredo, C., 2019. Understanding the Role of Entrepreneurial Orientation in Junior Enterprises. *Journal of Entrepreneurship Education*, [e-journal] 22(2), pp.1-14.

Alvarenga, A.B.C. de S., Espuny, M., Reis, J.S. da, Motta, Silva, F. de O., Sampaio, N.A. de S., … Oliveira, O.J., 2021. The Main Perspectives of the Quality of Life of Students in the Secondary Cycle: An Overview of the Opportunities, Challenges and Their Greatest. *International Journal for Quality Research*, [e-journal] 15(3), p.22. DOI: 10.18421/IJQR15.03-19.

Araujo, M.J.F. de, Araújo, M.V.F. de, Araujo Jr, A.H. de, Barros, J.G.M. de, Almeida, M. da G. de, Fonseca, B.B. da, … Sampaio, N.A.D.S., 2021. Pollution Credit Certificates Theory: An Analysis on the Quality of Solid Waste Management in Brazil. *Quality Innovation Prosperity*, [e-journal] 25(3), pp.1-17. https://doi.org/10.12776/qip.v25i3.1574.

Barba-Sánchez, V. and Atienza-Sahuquillo, C., 2018. Entrepreneurial Intention among Engineering Students: The Role of Entrepreneurship Education. *European Research on Management and Business Economics*, [e-journal] 24(1), pp.53-61. https://doi.org/10.1016/j.iedeen.2017.04.001.

Barton, M., Schaefer, R. and Canavati, S., 2018. To Be or Not to Be a Social Entrepreneur: Motivational Drivers amongst American Business Students. *Entrepreneurial Business and Economics Review*, [e-journal] 6(1), pp.9-35. https://doi.org/10.15678/EBER.2018.060101.

Belitski, M. and Heron, K., 2017. Expanding Entrepreneurship Education Ecosystems. *Journal of Management Development*, [e-journal] 36(2), pp.163-177. https://doi.org/10.1108/JMD-06-2016-0121.

Belkind, O., 2021. Bacon'S Inductive Method and Material Form. *Epistemology and Philosophy of Science*, [e-journal] 58(3), pp.57-68. https://doi.org/10.5840/eps202158343.

Bell, R., 2016. Unpacking the link between entrepreneurialism and employability: An assessment of the relationship between entrepreneurial attitudes and likelihood of graduate employment in a professional field. *Education + Training*, 58(1), pp. 2-17. https://doi.org/10.1108/ET-09-2014-0115.

Bengtsson, M., 2016. How to Plan and Perform a Qualitative Study Using Content Analysis. *NursingPlus Open*, [e-journal] 2, pp.8-14. https://doi.org/10.1016/j.npls.2016.01.001.

Bergmann, H., Hundt, C. and Sternberg, R., 2016. What Makes Student Entrepreneurs? On the Relevance (and Irrelevance) of the University and the Regional Context for Student Start-Ups. *Small Business Economics*, [e-journal] 47(1), pp.53-76. DOI: 10.1007/s11187-016-9700-6.

Bezanilla, M.J., García-Olalla, A., Paños-Castro, J., and Arruti, A., 2020. Developing the Entrepreneurial University: Factors of Influence. *Sustainability (Switzerland)*, [e-journal] 12(3), pp.842. https://doi.org/10.3390/su12030842.

Bischoff, K., Volkmann, C.K., and Audretsch, D.B., 2018. Stakeholder Collaboration in Entrepreneurship Education: An Analysis of the Entrepreneurial Ecosystems of European Higher Educational Institutions. *Journal of Technology Transfer*, [e-journal] 43(1), pp.20–46. https://doi.org/10.1007/s10961-017-9581-0.

Blankesteijn, M., Bossink, B., and Sijde, P., 2021. Science-Based Entrepreneurship Education as a Means for University-Industry Technology Transfer. *International Entrepreneurship and Management Journal*, [e-journal] 17(2), pp.647-669. https://doi.org/10.1007/s11365-019-00623-3.

Boldureanu, G., Alina, M., Bercu, A., Boldureanu, D., and Bedrule-grigorut, M.V., 2018. Entrepreneurship Education through Successful Entrepreneurial Models in Higher Education Institutions Gabriela. *Sustainability (Switzerland)*, [e-journal] 10(11), p.1-33. https://doi.org/10.3390/su12031267.

Bolzani, D., Munari, F., Rasmussen, E., and Toschi, L., 2021. Technology Transfer Offices as Providers of Science and Technology Entrepreneurship Education. *Journal of Technology Transfer*, [e-journal] 46, pp.787-814. DOI: https://doi.org/10.1007/s10961-020-09788-4.

Brüne, N., and Lutz, E., 2020. The Effect of Entrepreneurship Education in Schools on Entrepreneurial Outcomes: A Systematic Review. *Management*

Review Quarterly, [e-journal] 70(2), pp.275–305. https://doi.org/10.1007/s11301-019-00168-3.

Caliendo, M., Goethner, M., and Weißenberger, M., 2020. Entrepreneurial Persistence beyond Survival: Measurement and Determinants. *Journal of Small Business Management*, [e-journal] 58(3), pp.617–647. https://doi.org/10.1080/00472778.2019.1666532.

Cárdenas-Gutiérrez, A.R., Bernal-Guerrero, A., and Montoro-Fernández, E., 2021. Construction and Validation of the Basic Scale of Entrepreneurial Competencies for the Secondary Education Level. A Study Conducted in Spain. *PLoS ONE*, [e-journal] 16(4 April). https://doi.org/10.1371/journal.pone.0249903.

Carvalho, F.Z. de, Bersani, V.T., Maldaner, L.F., and Piqué, J.M., 2020. Institutions That Foster Innovative Entrepreneurship in Brazil: Mapping and Connections. *Revista Prâksis*, [e-journal] 2, p.245. https://doi.org/10.25112/rpr.v1i0.1961.

Çera, G., Çera, E., Rozsa, Z., and Bilan, S., 2021. Entrepreneurial Intention as a Function of University Atmosphere, Macroeconomic Environment and Business Support: A Multi-Group Analysis. *European Journal of Training and Development*, [e-journal] 45(8–9), pp.706–724. https://doi.org/10.1108/EJTD-08-2019-0148.

Costa, A.C.F., Santos, V.H. de M., and Oliveira, O.J., 2021. Towards the Revolution and Democratization of Education: A Framework to Overcome Challenges and Explore Opportunities through Industry 4.0. *Informatics in Education*, [e-journal] 21(01). pp.1-32. https://doi.org/10.15388/infedu.2022.01.

Costa, S.F., Santos, S.C., Wach, D., and Caetano, A., 2018. Recognising Opportunities across Campus: The Effects of Cognitive Training and Entrepreneurial Passion on the Business Opportunity Prototype. *Journal of Small Business Management*, [e-journal] 56(1), pp.51–75. https://doi.org/10.1111/jsbm.12348.

Cualheta, L.P., and Abbad, G. da S., 2021. What Does Entrepreneurship Education Look like in Brazil? An Analysis of Undergraduate Teaching Plans. *Education and Training*, [e-journal] 63(7–8), pp.1043–1057. https://doi.org/10.1108/ET-05-2020-0106.

da Rocha, A.B.T., Borges de Oliveira, K., Espuny, M., Salvador da Motta Reis, J., and Oliveira, O.J., 2022. Business Transformation through Sustainability Based on Industry 4.0. *Heliyon*, [e-journal] 8(8), p.e10015. https://doi.org/10.1016/j.heliyon.2022.e10015.

Davies, I.A., Haugh, H., and Chambers, L., 2019. Barriers to Social Enterprise Growth. *Journal of Small Business Management*, [e-journal] 57(4), pp.1616–1636. DOI: 10.1111/jsbm.12429.

Dewan, J., and Singh, A.K., 2017. The Configuration Approach to Entrepreneurship Education: The Case of an Entrepreneurship Course in a Management Program. In *Entrepreneurship Education: Experiments with Curriculum, Pedagogy and Target Groups*, pp.267–285. https://doi.org/10.1007/978-981-10-3319-3_15.

Duval-Couetil, N., Shartrand, A., and Reed, T., 2016. The Role of Entrepreneurship Program Models and Experiential Activities on Engineering Student Outcomes. *Advances in Engineering Education*, 5(1).pp.1-27.

Elkington, J., 1994. Towards the Sustainable Corporation: Win-Win-Win Business Strategies for Sustainable Development. *California Management Review*, [e-journal] 36(2), pp.90–100. https://doi.org/10.2307/41165746.

Elo, S., Kääriäinen, M., Kanste, O., Pölkki, T., Utriainen, K., and Kyngäs, H., 2014. Qualitative Content Analysis. *SAGE Open*, [e-journal] 4(1), pp.1-10. https://doi.org/10.1177/2158244014522633.

Entrialgo, M., and Iglesias, V., 2016. The Moderating Role of Entrepreneurship Education on the Antecedents of Entrepreneurial Intention. *International Entrepreneurship and Management Journal*, [e-journal] 12(4), pp.1209–1232. https://doi.org/10.1007/s11365-016-0389-4.

Espuny, M., da Motta Reis, J. S., Monteiro Diogo, G. M., Reis Campos, T. L., de Mello Santos, V. H., Ferreira Costa, A. C., … de Oliveira, O. J., 2021a. COVID-19: The Importance of Artificial Intelligence and Digital Health During a Pandemic. In: S. Latifi, ed., *18th International Conference on Information Technology–New Generations* (ITNG 2021). Cham: Springer, pp. 27–32. https://doi.org/10.1007/978-3-030-70416-2_4.

Espuny, M., Faria Neto, A., da Motta Reis, J. S., dos Santos Neto, S. T., Nunhes, T. V., and de Oliveira, O. J., 2021b. Building New Paths for Responsible Solid Waste Management. *Environmental Monitoring and Assessment*, [e-journal] 193(7), p.442. https://doi.org/10.1007/s10661-021-09173-00.

Etzkowitz, H., and Leydesdorff, L., 2000. The Dynamics of Innovation: From National Systems and "Mode 2" to a Triple Helix of University-Industry-Government Relations. *Research Policy*, [e-journal] 29(2), pp.109–123. https://doi.org/10.1016/S0048-7333(99)00055-4.

Etzkowitz, H., and Zhou, C., 2017. The Triple Helix. 2nd Edition, Routledge, London. https://doi.org/10.4324/9781315620183.

Farhangmehr, M., Gonçalves, P., and Sarmento, M., 2016. Predicting Entrepreneurial Motivation among University Students: The Role of Entrepreneurship Education. *Education and Training*, [e-journal] 58(7–8), pp.861–881. https://doi.org/10.1108/ET-01-2016-0019.

Fayolle, A., Verzat, C., and Wapshott, R., 2016. In Quest of Legitimacy: The Theoretical and Methodological Foundations of Entrepreneurship Education

Research. *International Small Business Journal: Researching Entrepreneurship*, [e-journal] 34(7), pp.895–904. https://doi.org/10.1177/0266242616649250.

Fearon, C., Furlotti, M., van Vuuren, W., and McLaughlin, H., 2021. Developing New Opportunities, Entrepreneurial Skills and Product/Service Creativity: A 'Young Enterprise' (YE) Perspective. *Studies in Higher Education*, [e-journal] 46(6), pp.1081–1098. https://doi.org/10.1080/03075079.2019.1672643.

Fonseca, L., Silva, V., Sá, J.C., Lima, V., Santos, G., Silva, R., 2022. B Corp versus ISO 9001 and 14001 certifications: Aligned, or alternative paths, towards sustainable development? *Corp Soc Responsib Environ Manag* [e-journal] 29, pp. 496–508. https://doi.org/10.1002/csr.2214.

Hagebakken, G., Reimers, C., and Solstad, E., 2021. Entrepreneurship Education as a Strategy to Build Regional Sustainability. *Sustainability (Switzerland)*, [e-journal] 13(5), pp.1–17. https://doi.org/10.3390/su13052529.

Hsu, J. L., and Pivec, M., 2021. Integration of Sustainability Awareness in Entrepreneurship Education. *Sustainability (Switzerland)*, [e-journal] 13(9), pp.1–14. https://doi.org/10.3390/su13094934.

Hsu, K. W., Chao, J. C., and Chao, C. Y., 2021. Place Attachment and Youth Entrepreneurship Community Participation in Guangfu Village, Taichung, Taiwan. *Environment, Development and Sustainability*, [e-journal] 23(8), pp.11607–11635. https://doi.org/10.1007/s10668-020-01130-0.

Huq, A., and Gilbert, D., 2017. All the World's a Stage: Transforming Entrepreneurship Education through Design Thinking. *Education and Training*, [e-journal] 59(2), pp.155–170. https://doi.org/10.1108/ET-12-2015-0111.

Iglesias-Sánchez, P. P., Jambrino-Maldonado, C., Velasco, A. P., and Kokash, H., 2016. Impact of Entrepreneurship Programmes on University Students. *Education and Training*, [e-journal] 58(2), pp.209–228. https://doi.org/10.1108/ET-01-2015-0004.

ILO, 2021. Statistical Brief. Retrieved from https://www.imf.org/en/Publications/WEO/Issues/2021/01/26/2021-world-economic-outlook-update.

Ilonen, S., 2021. Creating an Entrepreneurial Learning Environment for Entrepreneurship Education in HE: The Educator's Perspective. *Industry and Higher Education*, [e-journal] 35(4), pp.518–530. https://doi.org/10.1177/09504222211020637.

Jimenez, G., Santos, G., Sá, J.C., Ricardo, S., Pulido, J., Pizarro, A., Hernández, H., 2019. Improvement of productivity and quality in the value chain through lean manufacturing - A case study. *Procedia Manufacturing* [e-journal] 41, pp. 882-889. https://doi.org/10.1016/j.promfg.2019.10.011.

Johannisson, B., 2016. Limits to and Prospects of Entrepreneurship Education in the Academic Context. *Entrepreneurship and Regional Development*, [e-journal] 28(5–6), pp.403–423. https://doi.org/10.1080/08985626.2016.1177982.

Jones, P., Pickernell, D., Fisher, R., and Netana, C., 2017. A Tale of Two Universities: Graduates Perceived Value of Entrepreneurship Education. *Education and Training*, [e-journal] 59(7–8), pp.689–705. https://doi.org/10.1108/ET-06-2017-0079.

Jupp, V., 2006. *The Sage Dictionary of Social Research Methods*. [e-book]. 5th ed. London: Sage Publications Ltd. https://doi.org/10.4135/9780857020116.

Kallas, E., and Parts, E., 2021. From Entrepreneurial Intention to Enterprise Creation: The Case of Estonia, *Journal of Entrepreneurship in Emerging Economies*, [e-journal] 13(5), pp.1192–1214. https://doi.org/10.1108/JEEE-07-2020-0235.

Karimi, S., Biemans, H. J. A., Lans, T., Chizari, M., and Mulder, M., 2016. The Impact of Entrepreneurship Education: A Study of Iranian Students' Entrepreneurial Intentions and Opportunity Identification, *Journal of Small Business Management*, [e-journal] 54(1), pp.187–209. https://doi.org/10.1111/jsbm.12137.

Kothari, C. R., and Garg, G., 2019. *Research Methodology Methods and Techniques*, 4th ed. New Age International. Nova Deli: New Age International.

Kraus, S., Palmer, C., Kailer, N., Kallinger, F. L., and Spitzer, J., 2019. Digital Entrepreneurship: A Research Agenda on New Business Models for the Twenty-First Century, *International Journal of Entrepreneurial Behaviour and Research*, [e-journal] 25(2), pp.353–375. https://doi.org/10.1108/IJEBR-06-2018-0425.

Li, M., 2021. The Integration of Innovation and Entrepreneurship Education in Talent Training of Application-Oriented Universities, *The Sixth International Conference on Information Management and Technology*, pp.1–4. https://doi.org/10.1145/3465631.3465957.

Liang, Y., Wang, H., and Hong, W. C., 2021. Sustainable Development Evaluation of Innovation and Entrepreneurship Education of Clean Energy Major in Colleges and Universities Based on Spa-vfs and Grnn Optimised by Chaos Bat Algorithm, *Sustainability (Switzerland)*, [e-journal] 13(11), pp.1–26. https://doi.org/10.3390/su13115960.

Liu, Z., Xiong, C., and Xie, D., 2020. Application of the Online and Offline Blended Learning Mode in Innovation and Entrepreneurship Education, *Proceedings of 2020 IEEE International Conference on Teaching, Assessment, and Learning for Engineering, TALE 2020*, pp.803–806. https://doi.org/10.1109/TALE48869.2020.9368408.

Loi, M., Castriotta, M., and Di Guardo, M. C., 2016. The Theoretical Foundations of Entrepreneurship Education: How Co-Citations Are Shaping the Field,

International Small Business Journal: Researching Entrepreneurship, [e-journal] 34(7), pp.948–971. https://doi.org/10.1177/0266242615602322.

Mandel, R., and Noyes, E., 2016. Survey of Experiential Entrepreneurship Education Offerings among Top Undergraduate Entrepreneurship Programs, *Education and Training*, [e-journal] 58(2), pp.164–178. https://doi.org/10.1108/ET-06-2014-0067.

Maresch, D., Harms, R., Kailer, N., and Wimmer-Wurm, B., 2016. The Impact of Entrepreneurship Education on the Entrepreneurial Intention of Students in Science and Engineering versus Business Studies University Programs, *Technological Forecasting and Social Change*, [e-journal] 104, pp.172–179. https://doi.org/10.1016/j.techfore.2015.11.006.

Mindt, L., and Rieckmann, M., 2017. Desarrollo de Las Competencias Para El Emprendimiento Orientado a La Sostenibilidad En La Educación Superior: Una Revisión Bibliográfica de Los Métodos de Enseñanza y Aprendizaje, *Teoría de la Educación. Revista Interuniversitaria*, [e-journal] 29, pp.129-159. https://doi.org/10.14201/teoredu291129159.

Moldavska, A., and Welo, T., 2017. The Concept of Sustainable Manufacturing and Its Definitions: A Content-Analysis Based Literature Review. *Journal of Cleaner Production*, [e-journal] 166, pp.744–755. https://doi.org/10.1016/j.jclepro.2017.08.006.

Mongeon, P. e Paul-Hus, A., 2016. The Journal Coverage of Web of Science and Scopus: A Comparative Analysis. Scientometrics, [e-journal] 106(1), pp.213–228. https://doi.org/10.1007/s11192-015-1765-5.

Mura, M., Longo, M., Micheli, P., and Bolzani, D., 2018. The Evolution of Sustainability Measurement Research. *International Journal of Management Reviews*, [e-journal] 20(3), pp.661–695. https://doi.org/10.1111/ijmr.12179.

Nabi, G., Liñán, F., Fayolle, A., Krueger, N., and Walmsley, A., 2017. The Impact of Entrepreneurship Education in Higher Education: A Systematic Review and Research Agenda. *Academy of Management Learning and Education*, [e-journal] 16(2), pp.277–299. https://doi.org/10.5465/amle.2015.0026.

Nabi, G., Walmsley, A., Liñán, F., and Akhtar, I., 2018. Studies in Higher Education Does Entrepreneurship Education in the First Year of Higher Education Develop Entrepreneurial Intentions ? The Role of Learning and Inspiration. *Studies in Higher Education*, [e-journal] 5079, pp.303-320. https://doi.org/10.1080/03075079.2016.1177716.

Newman, A., Obschonka, M., Schwarz, S., Cohen, M., and Nielsen, I., 2019. Entrepreneurial Self-Efficacy: A Systematic Review of the Literature on Its Theoretical Foundations, Measurement, Antecedents, and Outcomes, and an Agenda for Future Research. *Journal of Vocational Behavior*, [e-journal] 110, pp.403–419. https://doi.org/10.1016/j.jvb.2018.05.012.

Nowiński, W., Haddoud, M. Y., Lančarič, D., Egerová, D., and Czeglédi, C., 2019. The Impact of Entrepreneurship Education, Entrepreneurial Self-Efficacy and Gender on Entrepreneurial Intentions of University Students in the Visegrad Countries. *Studies in Higher Education*, [e-journal] 44(2), pp.361–379. https://doi.org/10.1080/03075079.2017.1365359.

Nunhes, T., Espuny, M., Campos, T., Santos, G., Bernardo, M., and Oliveira, O. J., 2022. Guidelines to Build the Bridge between Sustainability and Integrated Management Systems : A Way to Increase Stakeholder Engagement toward Sustainable Development. *Corporate Social Responsability* [e-journal], pp.1–19. https://doi.org/10.1002/csr.2308.

Nunhes, T. V., Garcia, E. V., Espuny, M., Santos, V. H. de M., Isaksson, R., and Oliveira, O. J. de., 2021. Where to Go with Corporate Sustainability? Opening Paths for Sustainable Businesses through the Collaboration between Universities, Governments, and Organisations. *Sustainability (Switzerland)*, [e-journal] 13(3), pp.1-31. https://doi.org/10.3390/su13031429.

Obschonka, M., and Stuetzer, M., 2017. Integrating Psychological Approaches to Entrepreneurship: The Entrepreneurial Personality System (EPS). *Small Business Economics*, [e-journal] 49(1), pp.203–231. https://doi.org/10.1007/s11187-016-9821-y.

Passaro, R., Quinto, I., and Thomas, A., 2018. The impact of higher education on entrepreneurial intention and human capital. *Journal of Intellectual Capital*, [e-journal] 19(1), pp.135-156. https://doi.org/10.1108/JIC-04-2017-0056.

Premand, P. et al., 2016. Entrepreneurship Education and Entry into Self-Employment Among University Graduates, *World Development*, [e-journal] 77, pp.311–327. https://doi.org/10.1016/j.worlddev.2015.08.028.

Purzer, S., Fila, N., and Nataraja, K., 2016. Evaluation of Current Assessment Methods in Engineering Entrepreneurship Education. *Advances in Engineering Education*, [e-journal] 5(n1), pp.1-27. https://eric.ed.gov/?id=EJ1090526.

Reis, J. S. M., Costa, A. C. F., Espuny, M., Batista, W. J., Francisco, F. E., Gonçalves, G. S., … Oliveira, O. J., 2020. Education 4.0: Gaps Research Between School Formation and Technological Development. In: S. Latifi, ed., *17th International Conference on Information Technology–New Generations* (ITNG 2020). Cham: Springer, pp. 497–502. https://doi.org/10.1007/978-3-030-43020-7_55.

Robinson, S. et al., 2016. New Horizons in Entrepreneurship: From Teacher-Led to Student-Centered Learning, *Education and Training*, [e-journal] 58(7–8), pp.661–683. https://doi.org/10.1108/ET-03-2016-0048.

Rudhumbu, N., du Plessis, E. (Elize), and Maphosa, C., 2020. Challenges and Opportunities for Women Entrepreneurs in Botswana: Revisiting the Role of Entrepreneurship Education, *Journal of International Education in Business*, [e-journal] 13(2), pp.183–201. https://doi.org/10.1108/JIEB-12-2019-0058.

Sá, J.C., Oliveira, A.R., Carvalho, J.D., Santos, G., Silva, F., 2023. A New Conceptual Model for Excellence in Business, Towards Sustainable Development. *Quality Innovation Prosperity Journal* [e-journal] 27 (2), 33-59. https://doi.org/10.12776/QIP.V27I2.1866.

Santos, D.; Rebelo, M.; Santos, G., 2017. The Integration of certified Management Systems. Case Study – Organisations located at the district of Braga, Portugal. *Procedia Manufacturing* [e-journal] 13, pp. 964-971. https://doi.org/10.1016/j.promfg.2017.09.168.

Santos, S. C., Neumeyer, X., and Morris, M. H., 2019. Entrepreneurship Education in a Poverty Context: An Empowerment Perspective, *Journal of Small Business Management*, [e-journal] 57(S1), pp.6–32. https://doi.org/10.1111/jsbm.12485.

Scott, J.M., Penaluna, A., and Thompson, J.L., 2016. A critical perspective on learning outcomes and the effectiveness of experiential approaches in entrepreneurship education: do we innovate or implement? *Education + Training*, [e-journal] 58(1), pp.82-93. https://doi.org/10.1108/ET-06-2014-0063.

Soares, G. G. et al., 2021. Corporate Entrepreneurship Education's Impact on Family Business Sustainability: A Case Study in Brazil, *International Journal of Management Education*, [e-journal] 19(1), p.1-11. https://doi.org/10.1016/j.ijme.2020.100424.

Strawser, J. A., Hechavarría, D. M., and Passerini, K., 2021. Gender and Entrepreneurship: Research Frameworks, Barriers and Opportunities for Women Entrepreneurship Worldwide, *Journal of Small Business Management*, [e-journal] 59(sup1), pp. S1–S15. https://doi.org/10.1080/00472778.2021.1965615.

Thrane, C. et al., 2016. The Promise of Entrepreneurship Education: Reconceptualising the Individual–Opportunity Nexus as a Conceptual Framework for Entrepreneurship Education, *International Small Business Journal: Researching Entrepreneurship*, [e-journal] 34(7), pp.905–924. https://doi.org/10.1177/0266242616638422.

Turner, T. e Gianiodis, P., 2018. Entrepreneurship Unleashed: Understanding Entrepreneurial Education outside of the Business School, *Journal of Small Business Management*, [e-journal] 56(1), pp.131–149. https://doi.org/10.1111/jsbm.12365.

United Nations, 1987. *Report of the World Commission on Environment and Development: Our Common Future*. Our Common Future.

Utami, C.W., 2017. Attitude, Subjective Norms, Perceived Behavior, Entrepreneurship Education and Self-Efficacy toward Entrepreneurial Intention University Student in Indonesia. *European Research Studies Journal*, [e-journal] 20(2), pp.475–495. https://doi.org/10.35808/ersj/654.

Utami, C.W., Bernardus, D., and Sintha, G., 2017. The Pattern Analysis of Family Business Succession: A Study on Medium Scale Family Business in Indonesia.

European Research Studies Journal, [e-journal] 20(2), pp.461–474. https://doi.org/10.35808/ersj/653.

Vieira, T.; Sá, J. C.; Lopes, M. P.; Santos, G.; Félix, M. J.; Ferreira, L. P.; Silva, F. J. G.; Pereira, M. T., 2019. Optimisation of the cold profiling process through SMED. *Procedia Manufacturing* [e-journal] 38, pp. 892–899. https://doi.org/10.1016/j.promfg.2020.01.171.

Villalobos Rodríguez, G., Moraga López, G., Guevara Portuguez, M.J., and Luis, A.C., 2021. Evidence of the Contribution of Entrepreneurship to the Reduction of

Youth Unemployment. *Revista Venezolana de Gerencia*, [e-journal] 26(95), pp.758–775.

Vodă, A.I., and Florea, N., 2019. Impact of Personality Traits and Entrepreneurship Education on Entrepreneurial Intentions of Business and Engineering Students. *Sustainability (Switzerland)*, [e-journal] 11(4), pp.1-17. https://doi.org/10.3390/SU11041192.

Wach, K., and Wojciechowski, L., 2016. Entrepreneurial Intentions of Students in Poland in the View of Ajzen's Theory of Planned Behaviour. *Entrepreneurial Business and Economics Review*, [e-journal] 4(1), pp.83–94. DOI: https://doi.org/10.15678/EBER.2016.040106.

Walter, S.G., and Block, J.H., 2016. Outcomes of Entrepreneurship Education: An Institutional Perspective. *Journal of Business Venturing*, [e-journal] 31(2), pp.216–233. https://doi.org/10.1016/j.jbusvent.2015.10.003.

Welsh, D.H.B., Tullar, W.L., and Nemati, H., 2016. Entrepreneurship Education: Process, Method, or Both? *Journal of Innovation and Knowledge*, [e-journal] 1(3), pp.125–132. https://doi.org/10.1016/j.jik.2016.01.005.

Wesseling, W.I.E., 2021. Towards a More All-Inclusive Evaluation of Interventions for Unemployed Youth: A Longitudinal Investigation of Participant, Programme, Relational and Contextual Factors. *Social Policy and Administration*, [e-journal] 55(7), pp.1145–1161. https://doi.org/10.1111/spol.12705.

Westhead, P., and Solesvik, M.Z., 2016. Entrepreneurship Education and Entrepreneurial Intention: Do Female Students Benefit? *International Small Business Journal: Researching Entrepreneurship*, [e-journal] 34(8), pp.979–1003. https://doi.org/10.1177/0266242615612534.

Wu, W., Su, Y., Wu, C.H., Tsai, S.B., and Yuan, Y.H., 2022. WeChat Relationships Maintenance Behavior and Social Entrepreneurial Intention under Conditions of Dual Narcissism: The Mediating Role of Social Capital. *Information Technology and People*, [e-journal] 35(1), pp.392–409. https://doi.org/10.1108/ITP-04-2020-0248.

Yi, S., and Duval-Couetil, N., 2021. Standards for Evaluating Impact in Entrepreneurship Education Research: Using a Descriptive Validity Framework to Enhance Methodological Rigor and Transparency. *Entrepreneurship: Theory and*

Practice, [e-journal] 46(6), pp.1685-1716. https://doi.org/10.1177/10422587211018184.

Zgodavova, K., Bober, P., Majstorovic, V., Monkova, K., Santos, G., Juhaszova, D., 2020. Innovative methods for small mixed batches production system improvement: The case of a bakery machine manufacturer. *Sustainability (Switzerland)* [e-journal] 12, pp. 6266. https://doi.org/10.3390/su12156266.

Zollo, L., Laudano, M.C., Ciappei, C., and Zampi, V., 2017. Factors Affecting Universities' Ability to Foster Students' Entrepreneurial Behaviour: An Empirical Investigation. *Journal of Management Development*, [e-journal] 36(2), pp.268–285. https://doi.org/10.1108/JMD-06-2016-0093.

ABOUT AUTHORS

Fernanda de Oliveira Silva[0000-0002-9625-6320] (F.O.S.) – Graduate student, Universidade Federal do ABC (UFABC), Brazil, e-mail: fernanda.o@aluno.ufabc.edu.br.

Maximilian Espuny[0000-0002-3189-0355] (M.E.) – Researcher, Universidade Estadual Paulista (UNESP), Brazil, e-mail: maxespuny@gmail.com.

Ana Carolina Ferreira Costa[0000-0002-0767-728X] (A.C.F.C.) – Researcher, Universidade Estadual Paulista (UNESP), Brazil, e-mail: ana.c.costa@unesp.br.

Yadirka Bolaños Anaya[0000-0002-4886-097X] (Y.B.A.) – Researcher, Universidade Estadual Paulista (UNESP), Brazil, e-mail: yadirkaba1985@gmail.com.

Amanda Marcondes Faria[0000-0002-9036-0522] (A.M.F.) – Graduate student, Centro Universitário Internacional (UNINTER), Brazil, e-mail: amandamarcondesfaria@gmail.com.

Gilberto Santos[0000-0001-9268-3272] (G.S.) – DrS, Prof. at Design School at the Polytechnic Institute of Cávado Ave (IPCA) and Researcher at ID+, Campus do IPCA, Barcelos, Portugal, e-mail: gsantos@ipca.pt.

Otávio José de Oliveira[0000-0002-5192-3644] (O.J.O.) – Ph.D., Production Engineering Post Graduation Programme, São Paulo State University FEG/UNESP, Guaratinguetá - SP, Brazil, e-mail: otaviodeoliveira@uol.com.br.

AUTHOR CONTRIBUTIONS

Conceptualisation, F.O.S, M.E. and O.J.O.; Methodology, A.C.F.C. and M.E.; Validation, G.S., O.J.O. and M.E.; Formal analysis, F.O.S., M.E., A.C.F.C. and O.J.O.; Investigation, F.O.S.; Resources, O.J.O.; Original draft preparation, F.O.S., M.E. and A M.F.; Review and editing, A.C.F.C., M.E. and O.J.O.; Visualization, Y.B.A. and G.S.; Supervision, O.J.O. and G. S.; Project administration, M.E. and O. J. O.; Funding acquisition, O.J.O. and G.S.

CONFLICTS OF INTEREST

The authors declare no conflict of interest. The funders had no role in the design of the study; in the collection, analyses, or interpretation of data; in the writing of the manuscript, or in the decision to publish the results.