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# Emprendimiento Sostenible: evolución y orígenes en la Educación Superior

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## Resumen

El emprendimiento sostenible ha emergido como un campo crucial en la educación superior, fusionando la creación de valor económico, social y ambiental. El objetivo de este artículo es examinar la evolución del ES en instituciones de educación superior (IES) antes de la pandemia de COVID-19, proporcionando una base para entender sus orígenes, desarrollo y una comprensión de estas prácticas educativas.
Su importancia yace a la urgencia de abordar desafíos globales como el cambio climático, la desigualdad social y la degradación ambiental. Las IES son clave en este contexto, preparando a futuros líderes y emprendedores para crear soluciones innovadoras y sostenibles. Sin embargo, la investigación sobre cómo estas instituciones han integrado el emprendimiento sostenible en sus currículos y programas educativos es limitada, especialmente en el periodo pre-pandémico.
La investigación se realizó en dos fases: una revisión sistemática de la literatura utilizando la metodología de Kitchenham, seguida de un análisis específico en documentos relacionados con la educación superior. Se identificaron 1209 artículos de siete bases de datos, de los cuales se seleccionaron 230 tras una revisión de títulos y resúmenes enfocados en el emprendimiento sostenible. Finalmente, 27 artículos fueron analizados a fondo por su relevancia específica a las IES.
Los hallazgos indican que las instituciones de educación superior deben continuar desarrollando y ampliando programas educativos que integren sostenibilidad y emprendimiento. La cooperación interinstitucional y con el sector empresarial, junto con un enfoque en la innovación pedagógica, son esenciales para fomentar una cultura de emprendimiento sostenible..

**Palabras claves:** Universidades; empresa; sostenibilidad.

# Sustainable Entrepreneurship: evolution and origins in Higher Education

## Abstract

Sustainable entrepreneurship has emerged as a crucial field in higher education, merging economic, social, and environmental value creation. This article aims to examine the evolution of sustainable entrepreneurship in higher education institutions before the COVID-19 pandemic, providing a basis for understanding its origins and development.
Its importance lies in the urgency of addressing global challenges such as climate change, social inequality, and environmental degradation. Higher education institutions are essential in this context, preparing future leaders and entrepreneurs to create innovative and sustainable solutions. However, research on how these institutions have integrated sustainable entrepreneurship into their curricula and educational programs is limited, especially in the pre-pandemic period. This study seeks to provide a detailed understanding of the development of these educational practices.
The research was conducted in two phases: a systematic literature review using Kitchenham's methodology and a specific analysis of papers related to higher education. A total of 1209 articles were identified from seven databases, from which 230 were selected after a review of titles and abstracts focused on sustainable entrepreneurship. Finally, 27 articles were analyzed in depth for their specific relevance to higher education.
The findings indicate that higher education institutions should continue to develop and expand educational programs that integrate sustainability and entrepreneurship. Inter-institutional cooperation and cooperation with the business sector and a focus on pedagogical innovation are essential to fostering a sustainable entrepreneurship culture.

**Keywords:** Universities; entrepreneurship; sustainability.

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## I. INTRODUCTION

The COVID-19 pandemic has disrupted societies and economies worldwide, prompting a reassessment of our global systems and priorities. In higher education, institutions have faced unprecedented challenges and have been forced to adapt rapidly to the changing landscape. Amidst the current uncertainty, sustainable entrepreneurship has gained renewed significance in higher education. It offers a transformative approach to meet the evolving needs of society and the environment.

The concept of sustainability gained popularity in the late 20th century as companies prioritized environmental improvement. Initially, businesses concentrated on adhering to ecological regulations and addressing pollution. Over time, they collaborated to establish policies to prevent pollution by enhancing their eco-efficiency and resource productivity. (Aravossis, 2004).

Sustainable entrepreneurship integrates entrepreneurial principles with sustainable practices, creating innovative solutions to address societal challenges while promoting economic growth and environmental conservation (Thomas et al., 2007; Schaltegger & Wagner, 2011). This shift was already predicted by Keijzers (2002), emphasizing cooperation and corporate responsibility as governments began creating agendas for the transformation.

Regarding higher education before the COVID-19 pandemic, sustainable entrepreneurship was already gaining traction, with institutions recognizing its potential to shape a sustainable future (Griffiths et al., 2012). Some authors have shown the variety of specialized fields in sustainable entrepreneurship, like politics, environmental sciences, sociology, economics, education, and more. Universities and colleges were implementing curricula, programs, and initiatives to instill entrepreneurial mindsets and skills in students, enabling them to create ventures that contribute to sustainability and social progress (Hockerts, 2017; Kickul & Lyons, 2012).

However, the COVID-19 pandemic, global warming, and the accompanying economic downturn catalyzed the need for sustainable entrepreneurship within higher education. The crisis exposed vulnerabilities in existing systems and highlighted the urgency of incorporating sustainable entrepreneurship into government, industry, and academia agendas at national and local levels (Hanaoka et al., 2018). It also demonstrated the interconnectedness of social, economic, and environmental factors. It emphasized the importance of equipping students with the tools needed to address sustainability, building resilient and adaptable entrepreneurial ecosystems, and taking the opportunity to build back better societies (Etzkowitz et al., 2000; Shepherd, 2020).

Higher education institutions (HEIs) faced significant disruptions during the pandemic, as they had to transition to online learning and adapt their operations. Universities around the world took a variety of actions to support sustainable entrepreneurship. Some of the most common initiatives include developing and offering new courses and programs in sustainable entrepreneurship, providing funding and mentorship to sustainable startups, hosting events and competitions to promote sustainable entrepreneurship, and partnering with businesses and government agencies (Fayolle & Liñán, 2014; Kolk & van Tulder, 2010; Pittaway & Cope, 2007).

Entrepreneurs and startups have demonstrated remarkable adaptability and resilience by pivoting their businesses to address emerging sustainability needs or contribute to pandemic response efforts. This change in focus is a testament to the ingenuity and flexibility of these businesses, enabling them to stay relevant and thrive in a rapidly changing landscape. The willingness of entrepreneurs and startups to pivot and adapt has been a source of encouragement and inspiration for many despite the challenges and uncertainties of the current situation.

Sustainable entrepreneurship is crucial to building a resilient and sustainable future in the post-pandemic era. It provides a comprehensive framework for integrating sustainability principles, social innovation, and entrepreneurship into higher education. By fostering sustainable entrepreneurship within higher education institutions (HEIs), students will have an entrepreneurial mindset to recognize opportunities, take calculated risks, and innovate in response to sustainability challenges (Zahra, Gedajlovic, Neubaum, & Shulman, 2009). These actions empower students to assume the role of change agents, capable of driving sustainable innovation, bolstering resilience, and effecting

meaningful societal impact (Stock & Kohl, 2018).

Furthermore, higher education institutions (HEIs) are actively involved in various initiatives promoting sustainable practices. These initiatives involve establishing dedicated entrepreneurship centers and incubators focusing on sustainable entrepreneurship (Shepherd & Patzelt, 2011). Additionally, there is a push for interdisciplinary collaboration and partnerships between faculties, departments, and research centers to promote innovative problem-solving (T.J. Dean & McMullen, 2007). HEIs also continue to forge valuable partnerships with industry, government agencies, non-profit organizations, and local communities, amplifying the impact of sustainable entrepreneurship initiatives (Kuckertz et al., 2020; Steffen, Broadgate, Deutsch, Gaffney, & Ludwig, 2015). They actively promote sustainability through sustainability-focused competitions, challenges, and hackathons, which inspire students to develop innovative and sustainable business concepts (Hockerts, 2017; Kolk & van Tulder, 2010). In parallel, HEIs have undertaken efforts to minimize their ecological footprint through energy-efficient measures, waste reduction programs, sustainable procurement policies, and the promotion of eco-friendly transportation options (Lozano et al., 2015). Additionally, they continue to conduct research in sustainable entrepreneurship and disseminate knowledge through publications, conferences, and seminars, contributing to advancing sustainable practices (Hockerts, 2017; S. Schaltegger & Wagner, 2011).

Finally, HEIs are committed to equipping students with the skills, knowledge, and entrepreneurial mindset necessary to create sustainable solutions. This goal is realized through comprehensive entrepreneurship education and training programs. Such programs meticulously cover an array of critical areas, including but not limited to sustainable innovation, market analysis, strategic business planning, and the nuances of sustainable finance (Fayolle & Liñán, 2014; Hockerts, 2017; Kickul & Lyons, 2012; Pittaway & Cope, 2007). Furthermore, the integration of sustainable entrepreneurship into the curricula of various disciplines ensures that students receive a comprehensive education incorporating sustainability principles into their chosen fields of study.

Higher education institutions have undertaken a multifaceted approach to foster sustainable entrepreneurship. These actions collectively reflect a commitment to preparing the next generation of entrepreneurs and change-makers to address the complex challenges of our time while simultaneously promoting sustainable practices across the academic and operational spheres.

This research aims to examine sustainable entrepreneurship's role and evolution in higher education before the COVID-19 pandemic. By exploring existing literature, we will assess the origins of sustainable entrepreneurship and its evolution in higher education.

To attain our objective, we propose the following framework. Chapter two will explore the methodology used to assess sustainable entrepreneurship before COVID-19. In chapter three, we will present the results and discourse arising from the systematic mapping of sustainable entrepreneurship, focusing on higher education. Chapter four will address the constraints of our efforts and conclusions of our findings. Furthermore, we will examine potential new areas for investigation.

## II. METHODOLOGY

A Systematic Literature Review (SLR) was developed to offer a thorough understanding of the current literature on sustainable entrepreneurship in higher education (B. Kitchenham, 2004). The outcome of conducting this mapping review is to create a record of papers, which provides an extensive outlook of the area and enables the identification of gaps and emerging research trends (B. A. Kitchenham, Budgen, & Pearl Brereton, 2011; Petersen, Feldt, Mujtaba, & Mattsson, 2008).

Per B. Kitchenham's (2004) research, a systematic mapping comprises three main stages: planning, conducting, and reporting the review. Figure 1 provides a detailed overview of each phase used for this particular research.

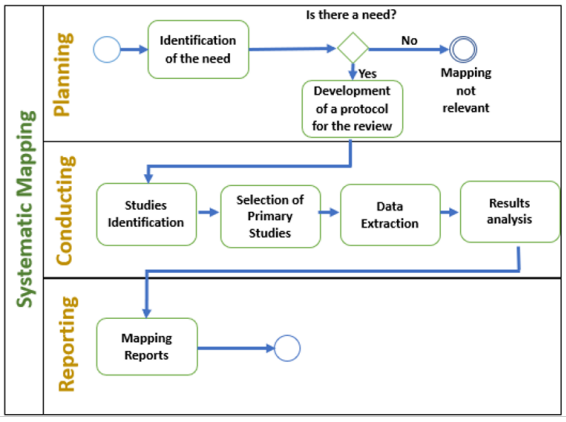


**Figure 1.** Systematic Mapping Process
**Source:** Own elaboration

The StArt software (State of the Art through Systematic Review tool) supports the systematic mapping technique following the phases and protocols based on Kitchenham's work. Therefore, it guided the research strategy (Fabbri et al., 2016).

### 2.1. Planning

In order to understand the role of universities in achieving sustainable development, a preliminary study was conducted to assess the available information on the subject. The study revealed a lack of data, indicating the need for further analysis of research on sustainable entrepreneurship from Higher Education Institutions (HEIs). Once the need for the research was confirmed, the protocol for the systematic review was defined:

**Objective:** To conduct a systematic review of the literature on sustainable entrepreneurship.

**Main Question:** What are the studies in sustainable entrepreneurship until 2019? Moreover, which ones are focused on higher education?

**Keywords and Synonyms:** The various terms widely used were included. "Sustainability entrepreneurship," "*emprendimiento sostenible*," "sustainability entrepreneurs," "sustainable entrepreneurial," "sustainable entrepreneurs," "sustainable entrepreneurship," "universidades," "*universities*," "*Instituciones de educación superior*," "Higher education institutions"

**Studies Languages:** Studies carried out in English and Spanish were considered.

**Source Search Methods:** Boolean operators were used in the different databases for advanced search.

**Source list:** The most relevant and widely used databases such as ACM, IEEE, Science Direct, Scopus, Web of Science, JSTOR, Taylor and Francis were considered.

### 2.2. Conducting

Upon definition of the SLR protocol, the conducting stage began, which included study identification, primary study selection, data extraction, and result analysis.

**Studies Identification:** The databases were extracted in RIS and Bibtex format on different dates. From among the selected databases, a corpus of 1209 documents were identified.

**Selection of Primary Studies:** Subsequently, 303 of these were identified as duplicates. In order to ensure greater precision during the initial stage of the selection process, only those documents whose titles and abstracts referenced the topic of sustainable entrepreneurship, and its various sub-themes (using pre-determined keywords and synonyms) were included. Additionally, documents other than scientific articles, book chapters, and conference proceedings were excluded. Consequently, the final collection comprised a total of 230 documents. These documents were classified according to the type of study developed as Education, Renewable Energy, Water and Ecosystems, Business Models, Case Study, Behavioral or Behavioral Studies, General Research (literature review, index and indicator development, other), and Agriculture.

**Data Extraction:** This section aims to analyze education and sustainable entrepreneurship documents comprehensively. Our approach involves categorizing the documents based on the year of their publication, the country where the research was conducted, the methodology employed, and the extent to which they address the three core sustainability pillars: economic growth, environmental progress, and social development. A total of 27 documents were extracted.

**Results analysis:** To thoroughly analyze the results, we meticulously reviewed the 27 documents that were ultimately extracted, where we could synthesize our findings and provide comprehensive answers to the research question at hand.

### 2.3. Reporting

Finally, to report the findings clearly and transparently, Mapping Reports are presented to organize the extracted data in a structured format. Figure 2 shows a summary of the literature review process performed.

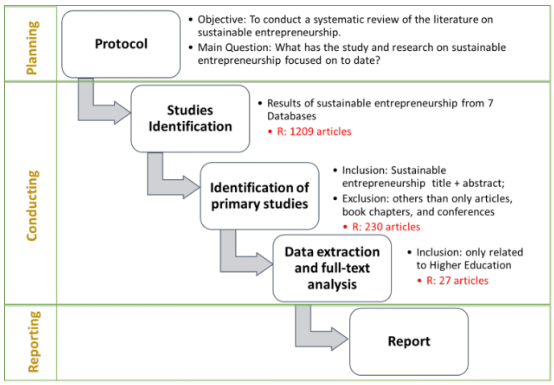


**Figure 2.** Summary of the process carried out until obtaining the results of the Systematic Mapping
**Source:** Own elaboration

## III. RESULTS AND DISCUSSIONS

### 3.1. Results

The systematic review results show that 80% of the research approaches to sustainable entrepreneurship focus on education studies, business models, behavioral, general research (literature review, development of indices and indicators, others), and case studies. Figure 3 shows the difference in the research approach between the 230 articles on sustainable entrepreneurship and the 27 focused on higher education.

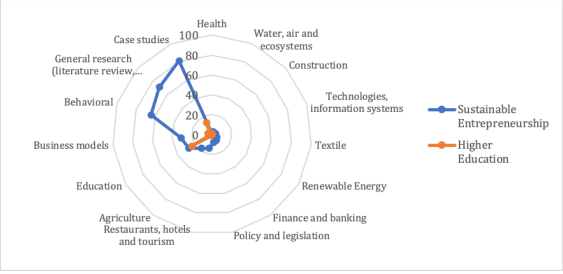


**Figure 3.** Research approach in sustainable entrepreneurship and sustainable entrepreneurship in HE
**Source:** Own elaboration

According to the study, 86% of the articles focus on sustainable entrepreneurship, addressing the three essential dimensions: social, cultural, and economic. This highlights the importance of a comprehensive concept understanding to ensure sustainable entrepreneurship's balanced and holistic development. However, 11% of the articles only consider the environmental-economic or cultural-environmental aspects, neglecting one dimension. Finally, 4% of the articles maintain the concept as purely aligned with only one of the three dimensions. Regarding articles related to higher education, 96% understand the concept holistically.

Regarding the methodology used, the results highlight that the majority of research on sustainable entrepreneurship prefers a qualitative methodology (67%), especially in the context of higher education (82%). The absence of quantitative studies in higher education suggests an opportunity for future research that can provide more concrete and measurable data. In addition, the use of mixed methodologies, although less common, shows the need for more integrative approaches that combine the depth of qualitative research with the precision of quantitative research.

Within the framework of research on sustainable entrepreneurship in higher education institutions, Table 1 presents the results of the studies identified in this review:

**Table 1.** Sustainable entrepreneurship articles from HEIs

| Article Code / Reference | Year | Country studied |
|---|---|---|
| 1 (Bonnet, Quist, Hoogwater, Spaans, & Wehrmann, 2006) | 2006 | Netherlands |
| 2 (Broberg & Krull, 2010) | 2010 | Denmark |
| 3 (Kardos, 2012) | 2012 | Europe |
| 4 (Natarajan, Eseonu, & Wyrick, 2012) | 2012 | NA |
| 5 (Zain et al., 2013) | 2013 | Malaysia |
| 6 (Parra, 2013) | 2013 | NA |
| 7 (Conner, Becot, Kolodinsky, Resnicow, & Woodruff, 2014) | 2014 | U.S |
| 8 (Lans, Blok, & Wesselink, 2014) | 2014 | NA |
| 9 (Iyer, 2015) | 2015 | NA |
| 10 (A. M. Ruiz-Ruano & Puga, 2015) | 2015 | NA |
| 11 (Contreras & Rodríguez, 2015) | 2015 | Colombia |
| 12 (A.-M. Ruiz-Ruano & Puga, 2016) | 2016 | NA |
| 13 (Chhabra & Raghunathan, 2016) | 2016 | NA |
| 14 (Warwick, Wyness, & Conway, 2017) | 2017 | U.K. |
| 15 (Ramírez Pasillas & Evansluong, 2017) | 2017 | Sweden |
| 16 (Fichter & Tiemann, 2018) | 2018 | U.S. and Germany |

| | | |
|---|---|---|
| 17 (Stock & Kohl, 2018) | 2018 | NA |
| 18 (Karlusch, Sachsenhofer, & Reinsberger, 2018) | 2018 | NA |
| 19 (Yan, Gu, Liang, Zhao, & Lu, 2018) | 2018 | China |
| 20 (Gil & Berbegal, 2018) | 2018 | NA |
| 21 (Maija, Puumalainen, & Fellnhofer, 2018) | 2018 | Europe |
| 22 (Tiemann, 2018) | 2018 | Germany and the U.S. |
| 23 (Obrecht, 2018) | 2018 | NA |
| 24 (Hermann & Bossle, 2020) | 2019 | NA |
| 25 (Nave & Franco, 2019) | 2019 | NA |
| 26 (Wagner, Schaltegger, Hansen, & Fichter, 2021) | 2019 | Germany |
| 27 (Wyness & Jones, 2019) | 2019 | U.K |
| ****NA: Not available information** | | |

**Source:** Own elaboration

The outcomes of the strategies and interventions to foster sustainability and innovation within higher education are delineated in Table 2. Owing to the constraints imposed by the journal regarding table length, the comprehensive details of the final full-text articles are made accessible via the subsequent link: 10.6084/m9.figshare.26280121

### 3.2. Discussions

#### 3.2.1 Sustainable Entrepreneurship

The literature on sustainable entrepreneurship dates back to 2002, when private enterprises were committed to moving from environmentally friendly production methods to truly sustainable entrepreneurship (Keijzers, 2002), and the first convincing examples of how to move from traditional to sustainable SMEs are becoming evident. (Crals & Vereeck, 2005) . For their part, in 2006, Fiona Tilley and William Young began to suggest that sustainable entrepreneurs could be the true wealth generators of the future (Tilley & Young, 2006) as they can act as essential catalysts for larger-scale socioeconomic structural transformations by designing businesses with the primary intention of contributing to improving environmental quality and social welfare in a mutually supportive way (Parrish & Foxon, 2006).

In 2007, the first article was written on sustainable entrepreneurship. Though the term had been applied in various ways, this was the first literature review to define it as a teleological process that creates value in three distinct dimensions: social, economic, and environmental. These dimensions are presented, analyzed, and synthesized in a unified framework (Katsikis & Kyrgidou, 2007). From here on, many other articles continue the research on sustainable entrepreneurship (e.g., Binder & Belz, 2015; Fellnhofer, Kraus, & Bouncken, 2014). A variety of terms, such as "ecopreneurship" or "green entrepreneurship," also start to appear when traditional companies attempt to incorporate environmental concerns into their business practices (e.g. Gast, Gundolf, & Cesinger, 2017; Gunawan & Dhewanto, 2012; Schaper, 2002; Thananusak, 2019). On the other hand, the term "social entrepreneur" was taken into account, considering the business and social spheres (e.g. Bento, Gianfrate, & Thoni, 2019; Davies & Chambers, 2018; Rahdari, Sepasi, & Moradi, 2016; Spence, Ben Boubaker Gherib, & Ondoua Biwolé, 2011). Finally, Shepherd & Patzelt (2011) define sustainable entrepreneurship more broadly, assuming that it focuses on the preservation of nature, the sustenance of life and the community in the search for perceived opportunities to bring to life the future products, processes, and services for profit, understanding profit, in a broad sense, as the economic and non-economic benefits for individuals, the economy and society, considering all three aspects.

On the other hand, a significant milestone was the signing of the United Nations Sustainable Development Goals agreement in 2015, which opened research contributing to their achievement (e.g. Moya-Clemente, Ribes-Giner, & Pantoja-Díaz, 2020; Stefan Schaltegger, Beckmann, & Hockerts, 2018; Volkmann, Fichter, Klofsten, & Audretsch, 2021). At the same time, the term business or entrepreneurship ecosystems is gaining momentum in research (e.g. Aliabadi, Ataei, Gholamrezai, & Aazami, 2019; Bank, Fichter, & Klofsten, 2017; Bischoff, 2021; Bischoff & Volkmann, 2018; Blok, 2018; DiVito & Ingen-Housz, 2021; Long, Blok, & Coninx, 2019; Moya-Clemente et al., 2020; Pankov, Velamuri, & Schneckenberg, 2021; Rahdari et al., 2016; Vlasov, 2021).

Subsequently, studies focused on case studies and exploratory studies of sustainable strategic models and environmental and behavioral or

perception analyses, trying to show that companies can solve social and environmental problems and be economically self-sufficient at the same time (e.g. Aghelie, Sorooshian, & Azizan, 2016; Chirinos, Meriño, Martinez, & Pérez, 2018; Criado-Gomis, Cervera-Taulet, & Iniesta-Bonillo, 2017; Fischer, Brettel, & Mauer, 2020; Mupfasoni, Kessler, & Lans, 2018; Naguit, 2018; Prokop, Stejskal, Hajek, & Kuba, 2019; Ratten, 2018; Schaefer, Corner, & Kearins, 2015; Stefan Schaltegger et al., 2018; Stefan Schaltegger, Lüdeke-Freund, & Hansen, 2016; Schimmenti, Migliore, Di Franco, & Borsellino, 2016; Soto-Acosta, Cismaru, Vatamanescu, & Ciochina, 2016; Sung & Park, 2018). However, it was not until 2017 that Recker and Koe proposed ways to measure sustainable business practices and predict and increase the sustainability impact generated by companies (Koe, Krishnan, Alias, Othman, & Ridzuan, 2017; Recker & Michelfelder, 2017) due to the lack of sustainability implementation strategies when creating a new company (Fischer et al., 2020).

Finally, innovation is considered pivotal in discovering novel solutions for sustainability; a minimum of 20% of all scholarly articles identify this theme as among the most emblematic ones linked with sustainable entrepreneurship (e.g. Aghelie et al., 2016; Ben Youssef, Boubaker, & Omri, 2018; Fellnhofer, 2017; Fernandes, Veiga, Peris-Ortiz, & Rueda-Armengot, 2017).

### 3.2.2 Sustainable entrepreneurship from higher education

Regarding sustainable entrepreneurship from Higher Education Institutions, in today's world, professionals need to have a comprehensive understanding of the impact of their work on society. More than simply possessing technical expertise is required, as sustainable development has become crucial in a highly competitive and demanding environment (Bonnet et al., 2006).

The relevance of higher education institutions (HEI) for social development is unquestionable because of their potential to contribute intellectual solutions for society's social, economic, and environmental welfare, and due to their growing practical relevance, sustainable entrepreneurship receives a high degree of academic attention. However, the literature on educating entrepreneurs about sustainability remains sparse (Halberstadt, Schank, Euler, & Harms, 2019).

The first study relating sustainable entrepreneurship to universities appeared in 2006. According to Bonnet H. et al., in 1996, Delft University of Technology introduced a course on sustainable entrepreneurship and technology in the Chemical Engineering and Materials Science Engineering programs, demonstrating that it is possible to successfully combine entrepreneurship, sustainability, and project education in one course for undergraduates. However, it was not until 2013 that sustainable entrepreneurship was integrated as a single concept. Prior to that, it was about relating education towards sustainability and entrepreneurship, but it was always two separate factors (Broberg & Krull, 2010; Kardos, 2012; Parra, 2013; Zain et al., 2013).

From there, the implementation of various strategies and specific curricular programs that integrate sustainability and entrepreneurship were adopted by universities around the world (Conner et al., 2014; Contreras & Rodríguez, 2015; Gil & Berbegal, 2018; Hermann & Bossle, 2020; Iyer, 2015; Lans et al., 2014; Ramírez Pasillas & Evansluong, 2017; Warwick et al., 2017; Yan et al., 2018); it is not until 2018 that the evaluation begins through exploratory analysis of the results of the implementation of these programs and the generation of models oriented to sustainable entrepreneurship (Fichter & Tiemann, 2018; Karlusch et al., 2018; Maija et al., 2018; Stock & Kohl, 2018; Tiemann, 2018). Additionally, in this same year, factors such as ethics (Obrecht, 2018), industry-university cooperation (Nave & Franco, 2019), and impact on the region (Wagner et al., 2021) begin to be considered. Finally, in this period, professors' sustainable entrepreneurship studies were also carried out (Chhabra & Raghunathan, 2016; A.-M. Ruiz-Ruano & Puga, 2016; A. M. Ruiz-Ruano & Puga, 2015).

### 3.3. Limitations

The limitation encountered in the first part of the study was the lack of information related to sustainable entrepreneurship from HEIs, which led the study to start from an initial recognition of sustainable entrepreneurship in a general way.

## IV. CONCLUSIONS AND FUTURE WORK

This research project clearly shows the differences in the evolution of the studies on sustainable entrepreneurship in higher education. We start from the systematic review of the literature until 2019, where only 27 articles were found, which showed a research gap in the topic.

The most important findings in terms of sustainable entrepreneurship could be summarized as follows:

1. Several researchers have developed key competency frameworks. However, their work is exploratory, and further analysis of these frameworks is required.
2. Most articles start by defining sustainable entrepreneurship as an entrepreneurial approach that seeks economic profitability and social and environmental value creation. Sustainable entrepreneurs identify and seize opportunities to innovate and create solutions that preserve the environment, promote community well-being, and generate economic benefits, thus contributing to society's integral and sustainable development. Even so, there are slight variations considering other perspectives, such as emotional, from small and medium enterprises, corporate social responsibility, religion, and innovation, among others.
3. Although there are literature reviews around sustainable entrepreneurship, their focus is derived from subtopics other than higher education, such as ecologically sustainable entrepreneurship or sustainable entrepreneurship in a general way.
4. Transitions in traditional systems are unlikely to succeed without coordination with regional policy actions; observations suggest that the path to sustainability begins with external collaboration with entities in the system surrounding the entrepreneur.

In terms of sustainable entrepreneurship from Higher Education Institutions, it is evident that a key role is being played in promoting sustainable entrepreneurship by implementing various strategies and specific curricular programs that integrate sustainability and entrepreneurship. This effort is evident in a variety of approaches and practices adopted by universities around the world.

First, specific curricular programs are designed to train entrepreneurs in strategic sectors such as agri-food, integrating sustainability principles into the educational process. The training of leaders and social entrepreneurs is supported by innovative educational approaches that foster creativity and innovation, promoting student-led projects that reflect these principles.

As observed in content analyses and curriculum reviews, creating and implementing specific educational frameworks that combine sustainability and entrepreneurship facilitate the integration of entrepreneurial principles into sustainability education. These programs develop key competencies in students and promote a holistic approach to sustainability.

Comparative research across different E.U. countries highlights the relationship between entrepreneurship, innovation, and sustainable development, offering policy recommendations for integrating these areas effectively. Institutional factors that facilitate or hinder support for sustainable entrepreneurship have been identified, providing suggestions for improving university support based on case studies.

Transnational education and the integration of sustainability into engineering curricula highlight the importance of education transcending borders, providing practical examples and case studies that illustrate how international education can promote sustainable practices. University-business cooperation, meanwhile, has proven beneficial in promoting successful sustainable practices, positively impacting innovation and sustainability.

Specific courses designed to foster creativity in sustainable business models, the structure of these courses, and the methodologies used underline the importance of education in developing creative competencies. In addition, integrated competency frameworks and collaboration among students are essential for the success of sustainable entrepreneurship, as demonstrated by the results obtained in various implementations.

The focus on educational change management from the student perspective, assessing the impact of university programs on regional and community development, shows how education can catalyze

sustainable entrepreneurship. Specific skills and training programs for sustainable entrepreneurs have been shown to foster innovation and entrepreneurship among university students.

University support systems for sustainable entrepreneurship are crucial, and their analysis provides recommendations for improving these systems, thus facilitating the success of sustainable entrepreneurship. Integrating sustainability ethics and creating communities of practice strengthen sustainability education, providing a community focus that enriches the educational experience.

Incorporating environmental values in education and teaching sustainable entrepreneurship to engineering students demonstrate the positive impact of these practices on students and their projects. Proposed pedagogical innovations and measuring sustainable orientation in academic entrepreneurship offer a futuristic and evidence-based vision for promoting sustainable entrepreneurship.

Finally, sustainability education enhances sustainable entrepreneurship and positively influences environmental policies. The perspectives and experiences of sustainability educators highlight challenges and opportunities, offering recommendations for improving sustainable entrepreneurship education and strengthening the connection between sustainability and higher education.

In conclusion, universities are taking a proactive role in promoting sustainable entrepreneurship through higher education. By implementing specific curricular programs, integrating innovative educational frameworks, university-business cooperation, and incorporating ethical and environmental values, these institutions are training the next generation of entrepreneurs committed to sustainability. These efforts not only benefit students but also have a significant impact on the community and the environment, contributing to global sustainable development.

**Future Work:** This article is part of an ambitious research project that aims to trace the evolution of sustainable entrepreneurship to the present day. As an initial phase, this study focuses on understanding the origins and development of these practices in institutions of higher education prior to the COVID-19 pandemic. Recognizing the importance and immediacy of addressing global challenges with sustainable solutions, this initial analysis establishes the basis for future work. A bibliometric analysis of the pandemic period is planned to complement this study, identify emerging trends, and uncover research gaps. This comprehensive approach will not only highlight the critical importance of sustainable entrepreneurship education but will also guide academics, institutions, and policymakers in creating innovative and effective strategies that respond to the demands of a changing world.

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