

ORIGINAL
Review article

Sustainable entrepreneurship: a systematic review of the literature*

Emprendimiento sostenible: una revisión sistemática de la literatura

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Abstract

Currently, problems such as environmental degradation, the wealth gap and unequal access to opportunities and resources are on the rise. These concerns have increased the need for sustainable entrepreneurship, defined as sustainable business practices. Entrepreneurship is central in the transition to a more sustainable future, while the alignment of social, economic, ecological goals and sustainable entrepreneurs play an important role. This systematic literature review analyzes the field of sustainable entrepreneurship and the extent of holistic integration in the global business arena, thus filling a gap in the existing literature. It aims to analyze the depth of existing literature on sustainable entrepreneurship, its definitions and its applications in business practices. The analysis is based on a literature search in the Scopus, Scielo, Redalyc, Google Scholar, Science Direct, Dialnet and DOAJ databases around the keyword "sustainable entrepreneurship". It concludes that desired levels of sustainability require collaborations between all stakeholders, while the transition towards service-oriented business models has contributed to the growth of sustainable entrepreneurship. However, existing institutional structures favor current unsustainable businesses and systems over newer sustainable ones, requiring eco-entrepreneurs to initiate institutional changes.

Keywords: Sustainable Entrepreneurial Intention, Sustainable Entrepreneurship, Sustainable Entrepreneurship Education, Sustainable Digital Entrepreneurship

Resumen

Actualmente, están incrementando los problemas como la degradación ambiental, la brecha de riqueza y el acceso desigual a oportunidades y recursos. Estas preocupaciones han aumentado la necesidad de un espíritu empresarial sostenible, definido como prácticas comerciales sostenibles. El espíritu empresarial es central en la transición hacia un futuro más sostenible, mientras que la alineación de los objetivos sociales, económicos, ecológicos y los empresarios sostenibles juegan un papel importante. Esta revisión sistemática de la literatura analiza el campo del emprendimiento sostenible y el alcance de la integración holística en el ámbito empresarial global, por lo tanto, llena un vacío en la literatura existente. Su objetivo es analizar la profundidad de la literatura existente sobre el emprendimiento sostenible, sus definiciones y sus aplicaciones en las prácticas empresariales. El análisis se basa en una búsqueda bibliográfica en la base de datos Scopus, Scielo, Redalyc, Google Scholar, Science Direct, Dialnet y DOAJ, en torno a la palabra clave "emprendimiento sostenible". Se concluye que los niveles deseados de sostenibilidad requieren colaboraciones entre todas las partes interesadas, mientras que la transición hacia modelos de negocio orientados a servicios ha contribuido al crecimiento del espíritu empresarial sostenible. Sin embargo, las estructuras institucionales existentes favorecen los negocios y sistemas insostenibles actuales sobre los sostenibles más nuevos, exigiendo que los ecoemprendedores inicien cambios institucionales.

Palabras clave: Intención Emprendedora Sostenible, Emprendimiento Sostenible, Educación para el Emprendimiento Sostenible, Emprendimiento Sostenible Digital

SUMMARY

INTRODUCTION. - RESOLUTION SCHEME. - I. Research problem - II. Methodology. - III. Research results. 1. Sustainable Entrepreneurial Intention. - 2. Sustainable entrepreneurship. - 3. Competency-oriented education of future sustainable entrepreneurs. - 4. Digital sustainable entrepreneurship. - CONCLUSIONS. - REFERENCES.

Introduction

Despite the economic development that is occurring worldwide, there has been an increase in economic, social and environmental threats. The deterioration and unsustainable utilization of resources has led to different difficulties for the environment and the global society. Associated with this alone, the quest to execute the financial purpose of organizations has led to increased use of resources to produce products and services with short life spans (Lara et al., 2021). In addition, climate change threatens the survival and stability of modern societies. More people are starving and living in poverty. The wealth gap is increasing, and gender inequalities and unequal access to opportunities and resources are persistent (Ploum et al., 2018).

These issues, among others, of varying intensity depending on the context, have increased the need for sustainable entrepreneurship. Entrepreneurship is finding and taking advantage of profitable opportunities. In contrast, sustainable entrepreneurship is the exploration, generation and execution of alternatives to create products and services that sustain the environment and the community and grant capacity building for others (Viteri et al., 2020). Sustainable entrepreneurs eliminate traditional business practices, systems and processes and replace them with superior social and environmental products and services (Vallaster et al., 2019). In this case, conventional market structures, production techniques, products and consumption patterns associated with unsustainability are destroyed in favour of more sustainable ones.

These patterns have a long-term positive impact on sustainable entrepreneurship. Otherwise, everyday entrepreneurship is channelled only in the economic area, and immediate need has confirmed that this perspective has a negative and unprofitable incidence for different companies (Ben Youssef et al., 2018). Thus, the influence of entrepreneurship is enormous and can be optimized to facilitate a transformation towards sustainability. Studying the elements of society, economy, and ecology is relevant and timely for sustainable entrepreneurship; it is suggested that sustainable entrepreneurs take into account the developments in society, environment and economy to know propensities and transformations in these elements and increase their skills to explore alternatives (Chaluisa et al., 2022).

Sustainable development and the future depend on these entrepreneurs and their influence on other investors and the general public to adopt sustainable practices. This scoping review of the literature analyzes the concepts that constitute the field of sustainable entrepreneurship and the extent of its integration into the global business landscape. It should be noted that the role of sustainable entrepreneurship can only be appreciated in the contextual characteristics of the operating environments in which it innovates, including markets and other institutional/regulatory factors. Faced with different environmental constraints, entrepreneurs tend to demonstrate different sustainability concerns due to different levels of interaction with different external actors to acquire tangible and intangible assets from the external environment to keep up with the competition.

Resolution scheme

1. Research problem

¿En qué consiste la intención emprendedora sostenible, el emprendimiento sostenible, la educación orientada a las competencias de los futuros emprendedores sostenibles y el emprendimiento sostenible digital?

2. Methodology

The scoping literature review methodology facilitates the advancement of knowledge by analyzing previous work on a topic of study of interest, making it a critical aspect of academic research. Xiao et al. (2019) explain that by summarizing, analyzing, and synthesizing existing work, researchers can understand the depth and breadth of existing literature, test hypotheses, develop new theories, and assess the quality and validity of existing research.

The motivations behind the choice of this methodology are based on Okoli's (2015) notion that scoping literature reviews can be conducted to "describe the knowledge available for professional practice, to identify effective research projects and techniques, to identify experts within a given field" (p. 882). In this case, the researcher hopes to provide information to help eco-entrepreneurs drive green ideas and innovations and attract other entrepreneurs and consumers to promote sustainability.

According to the literature review protocol, a step-by-step methodological approach was adopted to ensure that the data collected and analyzed are accurate, reliable, and applicable. In this sense, the literature review involved the screening and selection of information sources to ensure the validity and accuracy of the data interpreted and presented (Raimundo et al., 2021; Rosário et al., 2021). The study aims to answer the following questions:

- RQ1: What is the predominant concept of sustainable entrepreneurial intention?
- RQ2: What is the prevailing conceptualization of sustainable entrepreneurship?
- RQ3: How is education oriented to the competencies of future sustainable entrepreneurs?
- RQ4: What does digital sustainable entrepreneurship consist of?

The search string consisting of the keywords was used, as shown in table 1. They were also grouped with similar terms to obtain more articles to be analyzed, as shown in table 2.

Table 1. Key words and their synonyms

KEY WORDS	SIMILAR WORDS
Sustainable entrepreneurship	Sustainable Entrepreneurial Intention Sustainable entrepreneurial ecosystems Sustainable business development

Source: own elaboration.

Table 2. Search string

MAIN TERM	CADENA DE BÚSQUEDA
Sustainable entrepreneurship	("Intención empresarial sostenible" O "Ecosistemas empresariales sostenibles" O "Desarrollo empresarial sostenible")

Source: own elaboration.

The collection of information began with an inquiry in databases such as Scopus, Redalyc, Scielo, Science Direct, Google Scholar, DOAJ and Dialnet, as presented in Table 3, to focus on journals evaluated by the double-masked system (Cacciotti et al., 2015; Delgado et al., 2015). The identified articles were selected, considering the aspects presented in Table 3.

Table 3. Use of filters in databases

REFINE	SCOPUS	REDALYC	SCIENCE DIRECT	GOOGLE SCHOLAR	DIALNET	DOAJ	SCIELO
Open Access Type	25	570.205	26.712	12.600	47	20	680
Year (2019-2023)	47	131823	227	14400	47	15	268
Subject area (Business and management)	140	1.871	58	1342	47	19	173
Document type (Article)	82	672	37	850	29	20	263
	82	567	37	696		1	220
English language	12	-	-	2	-	-	10
Spanish language	-	2	-	-	-	-	6

Source: own elaboration.

All articles were reviewed for title, key terms, abstract, introduction, methods, results and conclusions. Exclusion and inclusion elements were identified for the review as follows: that the article refers to sustainable entrepreneurship, that it is linked to sustainable entrepreneurial intentions, and that it refers to sustainability. The database search identified 50 articles suitable for the research, as described in table 4.

Table 4. Items suitable for research

REFINE	SCIELO	SCOPUS	REDALYC	SCIENCE DIRECT	GOOGLE SCHOLAR	DIALNET	DOAJ
Filtered articles	263	82	672	37	850	29	20
Duplicate articles	115	40	320	24	421	14	8
	52	15	112	13	0	0	0
Articles requiring payment	10	12			9	8	11
Suitable articles	-	-	-	-	-	-	50

Source: own elaboration.

Updated articles were selected, and the abstracts were analyzed to exclude those that were not relevant. The parameter of suitability taken into account throughout the information collection procedure is related to the scientific authority of those who have published in the journals. The articles are selected by the scientific committee of renowned researchers from different nations and different academic specialties and the evaluators of the double-masked system who inspect the validity, applicability and innovation of the disciplines. The identified articles were evaluated taking into account the importance of the content, precision in the purpose of the study, clear specification of the environment where the research was conducted, the validity of the research methodology, and scientific rigour in the evaluation of the data (Revelo et al., 2018).

3. Research results

Fifty articles published from the year 2019 to the year 2023 were identified as presented in table 5. In addition, the article's country of origin was identified, as shown in table 6.

Table 5. Year of publication of articles

YEAR	N° OF ARTICLES
2023	7
2022	13
2021	12
2020	13

2019	5
Total	50

Source: own elaboration.

Table 6. *Country of origin of the article*

COUNTRY	N° OF ARTICLES
Germany	7
Pakistan	4
Romania	4
China	3
Ecuador	3
Taiwan	2
Saudi Arabia	2
India	2
Colombia	2
Poland	2
Finland	2
Italy	2
Qatar	1
Turkey	1
United States	1
Netherlands	1
Brazil	1
Sweden	1
Austria	1
Vietnam	1
France	1
Peru	1
Ghana	1
Algeria	1
South Africa	1
Spain	1
Indonesia	1
Total	50

Source: own elaboration.

An important part for a topic to have greater propagation in the scientific community is the contribution of researchers working on the topic in different scenarios. In the three Nordic countries, Denmark, Sweden and Finland, the government, private companies and the community contribute to achieving the objectives of sustainable development and making their countries better in social, economic, political and environmental aspects. In this review, we found 2 articles from Finland, which is a reference for the others for the great attempts to achieve the sustainable development goals, but they are not the only ones. The successive ones are the first five that have achieved an important position and scored between 85.90 and 82.10 in a level of 100: Finland, Sweden, Denmark, Germany and Belgium (Romero, 2021). Likewise, the predominant theme in the articles was identified, as shown in table 7.

Table 7. Predominant theme in the articles

THEME	N° ARTÍCULOS	AUTOR
Sustainable Entrepreneurial Intention	24	(Nit <i>et al.</i> , 2022) (Ledian <i>et al.</i> , 2023) (Nit <i>et al.</i> , 2023) (Chang <i>et al.</i> , 2022) (Abdelwahed, 2022) (Peng <i>et al.</i> , 2022) (Hirschfeld <i>et al.</i> , 2022) (Yang <i>et al.</i> , 2022) (Yasir <i>et al.</i> , 2022) (Fanea <i>et al.</i> , 2022) (Thelken <i>et al.</i> , 2020) (Moya <i>et al.</i> , 2020) (Middermann <i>et al.</i> , 2020) (Matzembacher <i>et al.</i> , 2019) (Hoogendoorn <i>et al.</i> , 2019) (Bajdor <i>et al.</i> , 2021) (Eller <i>et al.</i> , 2020) (Mefi <i>et al.</i> , 2020) (Tunio <i>et al.</i> , 2021) (Alwakid <i>et al.</i> , 2020) (Yasir <i>et al.</i> , 2021) (Yasir <i>et al.</i> , 2023) (Reuther, <i>et al.</i> , 2023) (Eller <i>et al.</i> , 2020) (Nguyen <i>et al.</i> , 2020)
Sustainable entrepreneurship	13	(Acosta <i>et al.</i> , 2021) (Sanchez <i>et al.</i> , 2020) (Fors, 2019) (Musona <i>et al.</i> , 2021) (Chaluisa <i>et al.</i> , 2022) (Tunçalp <i>et al.</i> , 2022) (Gregori <i>et al.</i> , 2019) (Lüdeke, 2020) (Guzmán <i>et al.</i> , 2020) (Adomako <i>et al.</i> , 2021) (Crecente <i>et al.</i> , 2021) (Akku <i>et al.</i> , 2022) (Altantsetseg <i>et al.</i> , 2020)
Competency-oriented education for future sustainable entrepreneurs.	5	(Diepolder <i>et al.</i> , 2021) (Biberhofer <i>et al.</i> , 2019) (Kummitha <i>et al.</i> , 2021) (Foucrier <i>et al.</i> , 2019) (Zamfirache <i>et al.</i> , 2023)
Digital sustainable entrepreneurship	3	(Nicolau <i>et al.</i> , 2022) (Xu <i>et al.</i> , 2022) (Baran <i>et al.</i> , 2021)
Sustainable business development	3	(Cheng <i>et al.</i> , 2021) (Eller <i>et al.</i> , 2020) (Altantsetseg <i>et al.</i> , 2020)
Sustainable entrepreneurial ecosystems	2	(Villegas, 2023) (Moggiet <i>et al.</i> , 2022)
Total	50	

Source: own elaboration.

3.1 Sustainable Entrepreneurial Intention

Entrepreneurial intention becomes sustainable when an individual's mindset indicates his or her belief and commitment to start a business in the future that considers and balances economic, social and environmental values (Agu *et al.*, 2021). The intention to start a sustainable business increases when an individual perceives good opportunities in the area where he or she lives (Middermann *et al.*, 2020). Participating in a specific sustainable entrepreneurship course positively relates to sustainable entrepreneurship intentions (Thelken *et al.*, 2020).

Similarly, attitudes and perceived entrepreneurial desirability shape sustainability-oriented entrepreneurial intention. They argue that individuals' altruistic notions shape their attitudes, while intrinsic and extrinsic rewards initiate perceived entrepreneurial desirability (Vuorio *et al.*, 2018). The role of sustainable entrepreneurs' moral antecedents in recognizing sustainable development opportunities is studied (Ploum *et al.*, 2018).

Also, the role of individuals' values, beliefs, and orientations in directing the firm toward sustainability is explored (Jahanshahi *et al.*, 2018). According to the theory of planned behaviour, there are three antecedents of sustainable entrepreneurial intentions: attitudes toward sustainable entrepreneurship, subjective norms, and perceived behavioural controls. Personal values influence the evaluation of these three antecedents. Through these antecedents, a mediating model, personal values and sustainable entrepreneurial intentions are related (Parastuty *et al.*, 2019).

In this vein, economic, social and environmental concerns are addressed in sustainable entrepreneurship, which focuses on creating businesses that positively impact society (Bögenhold, 2019). Innovation and risk management can be achieved by minimizing the amount of energy and other natural resources used in business. For a company to be sustainable, it must consider innovation and risk (Yasir *et al.*, 2021).

Sustainable enterprises underline the importance of business activity to achieve long-term social and environmental benefits (Betáková et al., 2021). An entrepreneur with a proper perspective can solve ecological, social and economic problems by applying new techniques. Entrepreneurship and sustainability are conceptually linked by the idea of collaboration (Linan et al., 2015).

Likewise, sustainable entrepreneurial intention is when a person participates in a specific course of sustainable entrepreneurship, perceives good opportunities in the area where he/she lives, and his/her mindset indicates his/her belief and commitment to start a business in the future that considers and balances economic, social, and environmental values in the long term through innovation and risk management. According to the theory of planned behaviour, there are three antecedents of sustainable entrepreneurial intentions: attitudes toward sustainable entrepreneurship, subjective norms, and perceived behavioural controls.

3.2 Sustainable entrepreneurship

Sustainable entrepreneurship needs: knowledge of current needs, policies and standards; belonging to multiple cooperation networks; management, but considering the spheres of sustainability; and value generation through invention, creation and disruption (Schaltegger et al., 2016). Sustainable entrepreneurship refers to identifying, exploiting and developing new business opportunities that lead to sustainability-oriented ideas to solve social and environmental problems. Sustainable entrepreneurship is characterized by the formation of a company that contains in its strategic objectives both economic and social development components and environmental protection (Sanchez et al., 2020).

In the same way, sustainable entrepreneurship includes aspects such as environmental issues, which are considered an integral part of business sustainability objectives, social change is considered a non-commercial objective of sustainable entrepreneurship, and sustainable entrepreneurship has to go beyond the market, including the basic idea and the objective (Schaltegger et al., 2011). In the same vein, sustainable entrepreneurship allows economic advancement and local development, helping to generate employment; it also contributes to the creation of goods and services collaborating in the growth of communities where these business initiatives generate a favourable impact, with results that facilitate profitability for the entrepreneur (Chirinos et al., 2018). Sustainable entrepreneurs are motivated by identities based on commercial and ecological logic to sequentially integrate the triple bottom line of social, ecological and economic objectives (Belz et al., 2017).

Sustainable entrepreneurs who pursue opportunities with environmental, economic, and social benefits pay attention to different facets of their environment, unlike those who focus primarily on opportunities with purely economic benefits (Hanohov et al., 2018). Similarly, sustainable entrepreneurs recognize changes in the physical biosphere and develop opportunities for environmental preservation, leading them to engage in profit-driven business activities that generate social and environmental value (Musona et al., 2021). Sustainable entrepreneurs prioritize addressing environmental challenges through their ecological logic when seizing an opportunity while attributing economic efficiency and profits through business logic. They must balance social and environmental value creation and private value creation, making their goals broader and more complex than those of other entrepreneurs (York et al., 2016).

Likewise, sustainable entrepreneurs are motivated by economic, environmental, and social gains. They differentiate between two forms of motivation, individual profit (threat awareness)

and the drive for profit for other individuals (altruism), and argue that the two forms of motivation play a key role in recognizing opportunities for sustainable entrepreneurship (Patzelt et al., 2011).

For this reason, sustainable entrepreneurship is the discovery and exploitation of economic opportunities through the generation of market imbalances that initiate the transformation of a sector towards an environmentally and socially more sustainable state; furthermore, it focuses on the preservation of nature, life and community sustenance in the pursuit of perceived opportunities to bring into existence future products, processes and services for profit", where profit includes economic and non-economic benefits for individuals, the economy and society (Tunçalp et al., 2022). Sustainable entrepreneurs introduce innovative business models and develop revolutionary technologies through creative destruction (Bertello et al., 2022).

Likewise, sustainable entrepreneurs take advantage of market failures, which deviate from sustainability and act market-oriented but with sustainable development goals. They also strive to create value beyond economic and financial returns. They are seen as agents of change who address critical environmental and social issues by seizing sustainable opportunities and creating economic and non-economic value for current and future generations. Sustainable entrepreneurs intentionally combine ecological and social value creation based on a business case. Sustainable entrepreneurs have different preferences than more traditional types of entrepreneurs. In this sense, their goals go beyond self-interest and profit orientation to creating multiple forms of value (Gregori et al., 2019).

Consequently, scholars argue that sustainable entrepreneurs are predestined to face and be affected by different institutional logic (commercial market, environmental protection and social welfare logic), which influence their objectives and behaviour (Muñoz et al., 2015). They characterize sustainable entrepreneurship as solving social and environmental problems by creating a successful business and promoting sustainable development through entrepreneurial activities (Schaltegger et al., 2011).

Similarly, sustainable entrepreneurs seek to solve ecological and social problems through their business activities and create value for various stakeholders, which adds further complexity to designing business models and aligning them with the interests of customers and financial stakeholders (Lüdeke, 2020). However, sustainable entrepreneurship is based on preserving nature, life and community sustenance in the pursuit of opportunities to create future products, processes and services for profit, where profit is broadly understood as economic and non-economic benefits to people, the economy and society. It addresses environmental challenges by adopting environmentally friendly policies and initiatives that enable entrepreneurial enterprises to thrive (Shepherd et al., 2011).

However, sustainable entrepreneurship enables organizations to develop economically viable businesses that contribute to addressing environmental and social injustice. Consequently, sustainable entrepreneurs aim to realize the sustainability of innovations that target the mass market and benefit most of society (Muñoz et al., 2015). Still, sustainable entrepreneurship involves the development of the following main elements: sustainability of nature; sustainability of life support systems and communities; development of economic benefits; maintenance of non-economic benefits for individuals; and provision of non-economic benefits to society (Shepherd et al., 2011).

It can also be established that sustainable entrepreneurship is defined as the preservation of nature, life and community sustenance in the pursuit of perceived opportunities to bring into existence future products, processes and services for economic and non-economic gains to individuals, the economy and society (Shepherd et al., 2011, p. 632). Therefore, sustainable

entrepreneurship is about creating sustainable enterprises and transforming and managing existing enterprises to be sustainable. Consequently, sustainable entrepreneurship can take place equally in start-ups, small and medium-sized enterprises (SMEs) and large enterprises to varying degrees (Gast et al., 2017).

Given its importance, Hall et al. (2010) assert that the cause of sustainable entrepreneurship practice is to create a sustainable and just society. In order to play an important role in building sustainable societies, several universities worldwide have developed research and training programs on sustainable entrepreneurship (Decamps et al., 2017; Olalla et al., 2019). It is how sustainable entrepreneurship involves discovering, evaluating and exploiting economic opportunities present in market failures that are detrimental to sustainability, including those affecting the health and safety of people relevant to the environment (Tunçalp et al., 2022).

Sustainable entrepreneurship is also defined as the teleological process that aims at sustainable development by discovering, evaluating and exploiting opportunities and value creation that produce economic prosperity, social cohesion and environmental protection (Katsikis et al., 2007). Similarly, stakeholders such as customers, non-governmental organizations or the media, who demand that companies integrate sustainability considerations into their core business, can be another important motivational facet (Amankwah et al., 2019). At the individual level, personal values such as altruism, universalism or benevolence can drive sustainable entrepreneurship (Breuer et al., 2017a, 2017b).

Therefore, sustainable entrepreneurship can be interpreted as focusing on the preservation of nature, the sustenance of life and community in the pursuit of perceived opportunities to create future products, processes and services, where the pursuit of opportunities generates benefits that, in a broad sense, include economic and non-economic benefits for people, the economy and society (Hoogendoorn et al., 2019; Stawicka, 2021). Finally, sustainable entrepreneurship, as an umbrella term, encompasses several approaches, such as "green" entrepreneurship, "ecopreneurship", "social business entrepreneurship" or "sustainability-motivated" entrepreneurship (Tunçalp et al., 2022).

3.3 Competency-oriented education of future sustainable entrepreneurs

The main objective of sustainable entrepreneurship education (SEE) is to equip entrepreneurs with the skills and attitudes necessary to evaluate business opportunities in light of environmental and social needs. The ambition of SEE is, therefore, to foster competencies. In general, competencies are described as a combination of knowledge, skills and attitudes required in specific contexts that enable individuals to act responsibly and self-organize to mature and achieve goals. Competency is an attribute or disposition a person needs to act successfully in different contexts and complex situations (Diepolder et al., 2021).

Likewise, education for sustainability aims to facilitate the development of the competencies needed to cope with (un)sustainable development. Competencies include cognitive aspects and affective, motivational and volitional elements. Competencies are essential for sustainability, which has yet to be the focus of traditional education and, therefore, requires special attention. They are linked to a context characterized by complexity, uncertainty, rapid social change, individualization and diversity (Biberhofer et al., 2019).

In the same way, sustainable entrepreneurship educators train people to effectively use existing resources to achieve sustainable development without jeopardizing the potential of future generations to access resources (Hermes et al., 2018). Most of the time, educators integrate sustainability and business education topics to deliver sustainable business education

modules (Gast et al., 2017). Therefore, academic education plays a crucial role in all three contexts, as they all have the same potential to contribute to sustainable development. In particular, academic institutions play a leading role in teaching sustainable entrepreneurship (Dentchev et al., 2018). It is highlighted that in Hong Kong, there is a growing interest in sustainable entrepreneurship courses, extracurricular activities and sustainable entrepreneurship competitions (Chandra, 2016).

In general, training in sustainable entrepreneurship and improving graduates' skills helps create new connections that will eventually help them in their professional careers. Students can connect with and potentially benefit from diverse networks by partnering with academic institutions. It is why there is a growing interest among the young population to attend sustainable entrepreneurship training programs (Kummitha et al., 2021). Thus, professionals deeply engaged in sustainability must develop competencies that adequately reflect and prepare them for their work in an era of transformation. Independent of any specific disciplinary background, such competencies are key in sustainability problem-solving. This framework integrates systems thinking, futures thinking, value thinking, strategic thinking, and interpersonal/professional skills to successfully contribute to sustainability transformations (Foucrier et al., 2019).

Consequently, environmental risk training is important for young people because it raises awareness of climate change and thus can influence cognitive processes that lead to sustainable business intention (Rus et al., 2020).

Similarly, Wiek et al. (2011) distinguish five key competencies for sustainability: systems thinking, anticipatory (or futures) thinking, normative (or values) thinking, interpersonal (or cooperative) relationships, and strategic (or management-oriented) thinking.

They have added another problem-solving competency, a meta competency of meaningfully using and integrating the five key competencies to solve sustainability problems and foster sustainable development (Wiek et al., 2016, p. 243). On the other hand, Brock et al. (2009) highlight that 75.00% of the sustainable entrepreneurship courses they reviewed were part of the academic curriculum. Previous studies on sustainable entrepreneurship training highlight that sustainable entrepreneurship training helps to improve the self-efficacy of nascent entrepreneurs and helps to start socially purposeful enterprises (Kummitha et al., 2015). Increasing academic attention has been given to understanding students' intentions to engage in sustainable entrepreneurship (Vuorio et al., 2018), the prosocial motives that influence their interest in sustainable entrepreneurship (Bacq et al., 2017), and the role of academic training in promoting sustainable entrepreneurship practice (Brock et al., 2009).

Although business education brings students closer to developing their competencies for sustainable entrepreneurship, it often fails to take into account the environmental dimension of sustainability in business. While these competencies can be linked to key sustainability competencies (e.g., stakeholder communication and interpersonal competence, ability to market the organization, and strategic competence), social entrepreneurs must be able to balance social value creation with financial goals, i.e., the double bottom line (Miller et al., 2012).

Furthermore, students will be trained as the next leaders of employee-owned businesses, charitable corporations, living local economies, Etc. In that case, competencies for sustainable entrepreneurship should focus on transformational knowledge and skills (e.g., knowledge of how to incorporate as an employee-owned business or as a charitable corporation, if legislation exists) (Wiek et al., 2011) (Wiek et al., 2011). Therefore, key competencies for sustainability

should be seen as competencies that enable individuals to successfully problem solve real-world sustainability problems, challenges and opportunities (Biberhofer et al., 2019).

Finally, competencies cannot be taught as predefined solutions, as learners develop them through the experience and reflection necessary for learners to solve sustainability problems with innovative market solutions, regardless of whether learners will start their own company or work for an entrepreneur. Despite the growing interest in sustainable entrepreneurship training, integrating sustainability into sustainable entrepreneurship training remains a problem (Diepolder et al., 2021).

3.4 Digital sustainable entrepreneurship

Today, a strong connection has emerged between business and the art of sustainable digital entrepreneurship (Holzmann et al., 2022). Identifying the key factors and deploying strategies for transitioning to digital entrepreneurship brings real advantages regarding vigilance in a highly competitive and constantly growing market (Ngoc-Vinh et al., 2022; Salamzadeh et al., 2022). Whether or not a company has a digital portfolio of products and services, it must take action to operate using digital media to position itself on the consumer's perceptual map (Srivastava et al., 2022). At the business level, the demand for a sustainable business environment has emerged (Amirova et al., 2021; Del Giudice et al., 2021; Fianto et al., 2022).

With digital activities undertaken within organisational activities, companies create social and environmental value, thus engaging in sustainable digital activities (Adomako et al., 2021). Sustainable digital entrepreneurship involves the corroboration of social, environmental and financial objectives and their implementation in digital products, platforms or ecosystems to create sustainable value (Baranauskas et al., 2022). Therefore, sustainable digital entrepreneurship has been defined as organisational activities that pursue the sustainable goal of driving social and environmental value creation through the creative deployment and use of digital technology (Xu et al., 2022). Digital platform ecosystems as living laboratories for sustainable entrepreneurship and innovation is a proposed conceptual model where the contribution of the model is twofold. First, it provides the framework for capturing the implicit processes of problem-solution matching and value co-creation in the digital platform ecosystem, which are realised through user actions mediated by the platform interface. Second, it provides the framework for examining and understanding the role of the broader social context in using a digital platform to develop sustainable entrepreneurship and innovation (Baran et al., 2021).

Thus, sustainable digital entrepreneurship is not satisfied with ad-supported viewers or slow-loading pages but understands the people of each generation and addresses their needs as best as possible (Munsch, 2021; Pourmohammadi, 2021). As a strategy to achieve sustainability (Gomez et al., 2021). In addition, adopting sustainable entrepreneurship entails adopting digital media, which can facilitate effects on consumer behaviour (Yakubu, 2022). Using software, apps, platforms, databases, websites, blogs, social media, social networks, virtual and augmented reality, chatbots or blockchain in companies means companies have significant assets to conduct digital activity (Wang et al., 2022).

Some authors have pointed out that sustainable entrepreneurship problems typically arise from information asymmetry, which manifests itself in the accuracy and timeliness of information transmission (Adomako, 2021). The analytical capacity, connective capacity, and smart capacity acquired with various digital technologies by various firms can address market failures in the economic, social and environmental domains, thus achieving a net positive

environmental impact (Gast et al., 2017). In another way, Baranauskas et al. (2022) combined the Triple Bottom Line (TBL) method to build a conceptual framework for digital sustainable value creation, arguing that digital sustainable entrepreneurship represents the process of integrating social, environmental and financial objectives into digital products, platforms or ecosystems to realise sustainable value creation.

Conclusions

Sustainable entrepreneurship differs from normal entrepreneurship in the social, economic and environmental dimensions of its economic, psychological, social and ecological consequences. Sustainable entrepreneurship is the realisation of sustainable innovations that target the mass market and benefit most of society. In making these (radical) sustainability innovations, sustainable entrepreneurs often respond to the unmet demand of a wider group of stakeholders.

Sustainable entrepreneurship training aims to achieve one of the following three objectives: initiate, secure and integrate. While initiation-based training aims to develop the skills of individuals to start enterprises that create blended value - defined as the simultaneous creation of social or ecological and commercial value, guarantee-based training aims to provide the skills and competencies needed to ensure the creation of blended value in existing organisations. In contrast, integration-based training aims to integrate the long-term unemployed into the labour market. The difference between initiation-based and guarantee-based training is that while the former aims to help start new enterprises, the latter strives to create combined value in existing organisations, typically incorporating commercial objectives in third-sector organisations and social or ecological objectives in commercial organisations.

Educators need to be more functionally linking skills and knowledge to what sustainability entrepreneurs do in creating and running sustainability-oriented enterprises. Current sustainability competency frameworks should be specified for sustainable entrepreneurship; current entrepreneurship and social entrepreneurship competency frameworks should be specified for sustainable entrepreneurship; and current sustainability competency frameworks should be specified for transformational sustainable entrepreneurship and structured along the processes of sustainable entrepreneurship.

Sustainability entrepreneurship competencies should specifically train entrepreneurs to identify, evaluate and realise business opportunities that contribute positively to sustainable development. Sustainable digital entrepreneurship is gaining increasing attention, representing the opportunity to integrate digital solutions that enable entrepreneurs to create and deploy new methods to win customers. In doing so, they improve the quality of life by substantially reducing social and environmental impact.

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