

A systemic mapping: Is entrepreneurship education research truly needed? By bibliometric analysis



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Abstract This study examines gaps in entrepreneurship education through a comprehensive big data analysis of current research. By reviewing prominent publications, journals, and authors, it provides a revised summary of the study landscape in this area. The primary goal is to identify major themes, best practices, and trends in entrepreneurship education. This study employs bibliographic analysis to identify new insights into the emerging gaps in ongoing research related to the significance of entrepreneurship education. It also explores recent issues in the field and highlights research findings on entrepreneurship education, while offering an overview of the future research landscape. As such, this research contributes to the understanding of existing academic debates surrounding entrepreneurial activity education. Furthermore, the review analyzes 182 articles from 2016 - 2024, all of which are indexed in Scopus, indicating that only a limited number of studies have explored this topic. Consequently, there remains ample opportunity for future researchers to expand on entrepreneurship education research. Findings revealed three core research clusters: the integration of entrepreneurial principles into educational systems, the drivers and intentions behind social entrepreneurship, and the challenges and skill development within Training in entrepreneurial skills. Furthermore, the study highlighted the diverse impacts of Training in entrepreneurial skills on students, such as the role of entrepreneurial intentions in startup success, the influence of This type of training in entrepreneurial skills and intentions, the development of effective educational strategies, and the analysis of factors shaping university students' entrepreneurial intentions. By exploring these areas, the research seeks to enhance entrepreneurship education and deepen understanding in the field.

Keywords: bibliometric, entrepreneurship, education, research, truly needed

1. Introduction

Entrepreneurship education refers to the process of fostering entrepreneurial intentions through improving participants' expertise, capabilities, mindset, and individual characteristics associated with entrepreneurship. (Hussain & Norashidah, 2015). In the 21st century, it has become widely acknowledged that entrepreneurship education in universities is a crucial factor influencing students' entrepreneurial intentions and actions (Jena, 2020). Despite its rapid integration into educational systems worldwide, the evaluation of its effectiveness has gained increased attention, leading to numerous empirical studies. For example, (Al-Lawati et al., 2021) reported that entrepreneurial training positively influences the perspectives of Omani graduate students on entrepreneurship. Similarly, (Jena, 2020) emphasized the crucial role that education plays in shaping students' entrepreneurial intentions. (Premand et al., 2016) discovered that entrepreneurship education significantly increases the likelihood of university graduates becoming self-employed within a year of graduation, with participants being 46–87% more likely to pursue self-employment than nonparticipants. These findings align with those of (P. Zhang & Cain, 2017), who reported that more than 50% of students in entrepreneurship education aim to become entrepreneurs after completing their courses. Furthermore, (Keat et al., 2011) argued that instruction and development in entrepreneurship influence learners' entrepreneurial conduct in the northern region of Peninsular Malaysia.

Several studies, including those by (Dumitran et al., 2020), (Harkema & Popescu, 2015), (Fan et al., 2024), (Sondari, 2014) and (Kurata et al., 2023), have highlighted the significance of entrepreneurial training for schools and college graduates in becoming capable business professionals. The goal of entrepreneurial teaching is to provide learners with essential skills through both education and training. These skills include developing business plans, conducting research, managing finances, and marketing, leadership, teamwork, and presentation abilities. While entrepreneurship education is designed for aspiring business founders and individuals with a business-oriented mindset, it is also incorporated into the broader business curricula provided by universities and business institutions (Kurata et al., 2023). Many countries place strong emphasis on entrepreneurship education, with active support from governments, corporations, and educational institutions (Teodoreanu, 2014). This form of learning is anticipated to support both personal career advancement and economic growth as well as address social challenges and foster sustainable development.



Entrepreneurial education has undergone substantial expansion in recent years, establishing itself as an essential tool for promoting entrepreneurial activities (Kucel & Vilalta-Bufi, 2016). This rise in interest is largely attributed to its ability to enhance students' entrepreneurial attitudes, skills, and competencies (Breitenecker et al., 2017). The prevailing view in current discussions is that entrepreneurial education greatly enhances the intention to pursue entrepreneurship (Breitenecker et al., 2017), and researchers have explored its impact on this intention globally (Nowiński et al., 2017). The majority concur that it nurtures learners' business-oriented mindset and intentions, equipping them with entrepreneurial ventures (Souitaris et al., 2007). First, entrepreneurship education fosters a creative environment and support system for generating new ideas (Breitenecker et al., 2017). Souitaris also noted that it can positively influence entrepreneurs' psychological states and motivations, inspiring entrepreneurial behavior and improving attitudes (Fan et al., 2024). Next, entrepreneurial programs increase understanding, capabilities, and expertise and the potential for entrepreneurial work. (Janowski & Szczepańska-Przekota, 2024). Gaining and integrating new knowledge also enhances entrepreneurs' ability to recognize opportunities, as their cognitive processes, driven by intention, lead to entrepreneurial actions. Third, when individuals from various disciplines collaborate within enterprise-focused learning, they have a greater tendency to access human resources and form entrepreneurial teams, facilitating closer connections with technical resources that have business potential (Fan et al., 2024).

Although entrepreneurial education has acquired prominence in contemporary scholarly work (Janowski & Szczepańska-Przekota, 2024) and (Nabi et al., 2017), numerous researchers contend that additional study is still necessary (Aparicio et al., 2019) and (Nicoitra et al., 2021), particularly regarding its lasting impact on communities and structures. (Mets et al., 2021), (Soares et al., 2021). The field continues to face gaps in research, practical resources, methodologies, and clear pedagogical approaches (Jones & Matlay, 2011), a concern also noted by (Turner & Gianiodis, 2017). Despite considerable progress within entrepreneurial education over the last twenty years, there remain significant uncertainties around what content should be taught, the best methods of instruction, who is eligible to instruct it, and the most suitable student audience. Furthermore, scholarly research does not consistently translate effectively into hands-on applications. (Kuratko & Morris, 2018) highlight that advancing entrepreneurial learning is a key strategy goal for the EU and its constituent nations.

Therefore, entrepreneurial learning ought to effectively equip communities equipped with specialized expertise in the field. This idea is supported by (Valerio et al., n.d.) and (Henry et al., 2005), who highlight insufficient expertise as a major obstacle to entrepreneurship. Raising recognition of new opportunities is essential for improving the upcoming efficiency of education. Notably, entrepreneurship education is increasingly recognized as practice-oriented, with a focus on educational programs that blend both instructional and hands-on learning methods (Henry et al., 2005) and (Gabrielsson et al., 2020). (Rasmussen & Sørheim, 2006) introduced the term "entrepreneurship education" to describe programs designed to prepare individuals for entrepreneurial careers, including independent work and the exploration of fresh opportunities. Nevertheless, (Gabrielsson et al., 2020) contend that the conflict between scholarly and practical methods in universities often hinders the full development of entrepreneurship education. Despite progress in integrating hands-on learning and embedding education within entrepreneurial ecosystems, this tension persists (Winarnowinaro et al., 2019), revealing the extent of what remains unknown about entrepreneurship education (Ratten & Jones, 2021).

This research seeks to resolve the existing academic debate and contribute to the advancement of management education, especially within the realm of advanced entrepreneurial learning. It does so by examining previous research findings through the lens of bibliometric analysis. The objective is to enhance the comprehension of entrepreneurial learning and identify trends and gaps in the field. The findings, presented through bibliometric analysis, will provide insights into future research directions in management education, specifically addressing challenges related to entrepreneurship education.

2. Materials and methods

In this study, we apply bibliometric analysis to identify knowledge gaps and suggest potential avenues for future research (van Eck & Waltman, 2010) and (Hollebeek et al., 2021). Our analysis relies primarily on the Scopus database, which is widely recognized as the most comprehensive source of peer-reviewed literature (Norris & Oppenheim, 2007). Scopus is highly valued for its vast collection of key publications from leading journals and prominent researchers (van Eck & Waltman, 2010). This review follows systematic screening procedures and structured data extraction to analyze the selected studies, evaluate their quality and synthesize the findings to detect patterns, trends, and variations in continuing education research methods. The final selection of research titles and abstracts was organized by research themes to establish connections with ongoing trends related to the topics addressed in this paper. As a result, this review aims to offer practical insights for both researchers in management education and policymakers interested in advancing research practices in sustainable entrepreneurship education. By adopting this approach, the study seeks to address biases, discuss limitations, and provide implications and recommendations (Zawacki-Richter et al., 2019).

In this study, we relied solely on the Scopus citation index to perform a bibliometric assessment and a systematic review of the literature, as emphasized by (Kumar & Harichandan, 2022). Given the technical difficulties in integrating multiple databases, researchers often prefer to use a single database, particularly for bibliometric assessments. However, the reliability of these analyses is frequently questioned, as each index has limited coverage and may not fully encompass the entire scope

of scholarly research on a particular topic, as highlighted by (Chistov et al., 2021). Identifying keywords related to entrepreneurship education research was a challenging undertaking.

The concepts are characterized by interchangeable terminology and overlapping ideas, resulting in research that is both inconsistent and multidisciplinary. Keywords for the analysis were selected on the basis of prior bibliometric studies. To facilitate the identification of relevant research, we applied the following final set of keywords in the title, keywords, and abstract.

For this analysis, we exclusively utilized the Scopus citation index to perform bibliometric and systematic literature assessment evaluations, as emphasized by (Kumar & Harichandan, 2022). Owing to the technical difficulties involved in integrating multiple databases, scholars often prefer to rely on one database, particularly for bibliometric assessments. However, the reliability of these evaluations can be questioned because the limited scope of each index may not fully encompass the complete breadth of academic research on a specific subject, as noted by (Chistov et al., 2021). Identifying keywords for entrepreneurship education research poses a challenge, as the concepts are characterized by multiple interchangeable terms and overlapping ideas, leading to research that is both variable and interdisciplinary. The selected keywords for this examination were derived from prior bibliometric research. The ultimate selection of keywords used within the title, key terms, and abstract helped guide the search for relevant research.

“Entrepreneurship Education” or “entrepreneurial education” or “social entrepreneurship education” or “Entrepreneurship education and entrepreneurial behavior” or “entrepreneurship in higher education” or “Entrepreneurship Education and Research.

In October 2024, we conducted queries with defined expressions in the Scopus database, which yielded 182 papers exclusively from Scopus. We then carefully reviewed the studies that were consistent with our study goals and eliminated any duplicate information (Chistov et al., 2021). Works published in book chapters and conference proceedings, and those published in languages other than English were removed from our dataset (Gupta et al., 2024).

3. Results and Discussion

Bibliometric and thematic analyses were applied to investigate the existing published sources, categorize the three groups of entrepreneurship education, and integrate them. Using bibliometric cocitation analysis (Paltrinieri et al., 2023) through VOSviewer, research streams within the literature were identified. Key elements such as prominent academic publications, research papers, approaches, study populations, concepts and conceptual structures were highlighted to enable the classification and integration of the Entrepreneurship Education published sources. Finally, the evaluation revealed knowledge gaps and proposed inquiries for upcoming research studies (Bahoo et al., 2020) and (Fellnhöfer, 2017).

VOSviewer generated bibliometric maps that facilitated the subsequent qualitative analysis (van Eck & Waltman, 2010). Abstracts of the documents in each cluster were carefully reviewed to confirm their relevance to the identified cluster. The analysis focused on similarities among impactful studies, referenced works, academic disciplines, researchers, publications, and institutions. The collected information was structured into a categorization system summarizing the groups in the scholarly sources of entrepreneurship education. This categorization was developed by integrating different graphical tools, group analysis, structured mapping, and thematic evaluation, offering detailed insights for upcoming studies in entrepreneurship education.

Cocitation and thematic analyses were employed to pinpoint academic trends and impactful work factors in the literature, resulting in the development of a classification and summary. This section highlights the trends in publications, authors, and emerging themes that shape the discussion regarding entrepreneurship education. Figures 1 and 2 visually present the results of our bibliometric analysis, showing a map of the research clusters. This map connects bibliographic coupling techniques with research topics in entrepreneurship education over the past five years (2016--2024), illustrating the relationships between items on the basis of the number of shared references across 182 analyzed papers. The content of the articles was examined by reviewing elements such as the title, researcher, publication, study inquiries, conceptual framework, information sources, key factors, categories, and main insights. This, combined with bibliometric evaluation, enabled scholars to recognize three interrelated scholarly avenues within the discipline of entrepreneurship education.

Cluster 1. – Yellow. In the yellow cluster, research connections related to entrepreneurship education were identified, including a study regarding entrepreneurial education using hidden trajectory modeling (Joensuu-Salo et al., 2024). This study examines educators' perspectives at Finnish University of Applied Sciences (UAS) regarding the significance and enthusiasm for entrepreneurial education, as well as the consistency of these perspectives over a three-year period. The findings highlight the need for initial career assistance and entrepreneurial development programs for educators. Similarly, (Saptono et al., 2021) reported that the external educational setting is strongly linked to entrepreneurial education and confidence in entrepreneurial ability. Additionally, entrepreneurial learning was shown to significantly mediate the connection between the external educational setting and students' confidence in their abilities. Our study suggests that elementary schooling plays a critical role in fostering self-efficacy and entrepreneurial intentions. (Kurata et al., 2023) support the notion that personal traits, abilities, and proficiencies can be influenced by education, and a comparative examination of entrepreneurial learning for business and engineering students will be explored in future research.

Entrepreneurship education activities (EEAs) aim to encourage entrepreneurial activity, but current studies on their influence on students' aspirations for entrepreneurship present mixed findings. Expanding upon this body of work, our exploratory research investigates the connection between academic and nonacademic activities categorized as startup discussions, training sessions, entrepreneurial contests, and participants' entrepreneurial intentions (Overwien et al., 2024). The field of entrepreneurship education (EE) is complex and requires a comprehensive evaluation across diverse research areas (Anubhav et al., 2024). EE is extensively recognized as an effective method to promote entrepreneurial prospects for young people (Mambali et al., 2024). While much of the literature indicates a positive link between EE and business startup aspirations, the exact mechanisms are still uncertain (Otache et al., 2024). This is a key aspect for addressing societal challenges related to sustainability through entrepreneurship education activities (Blankesteyn et al., 2024).

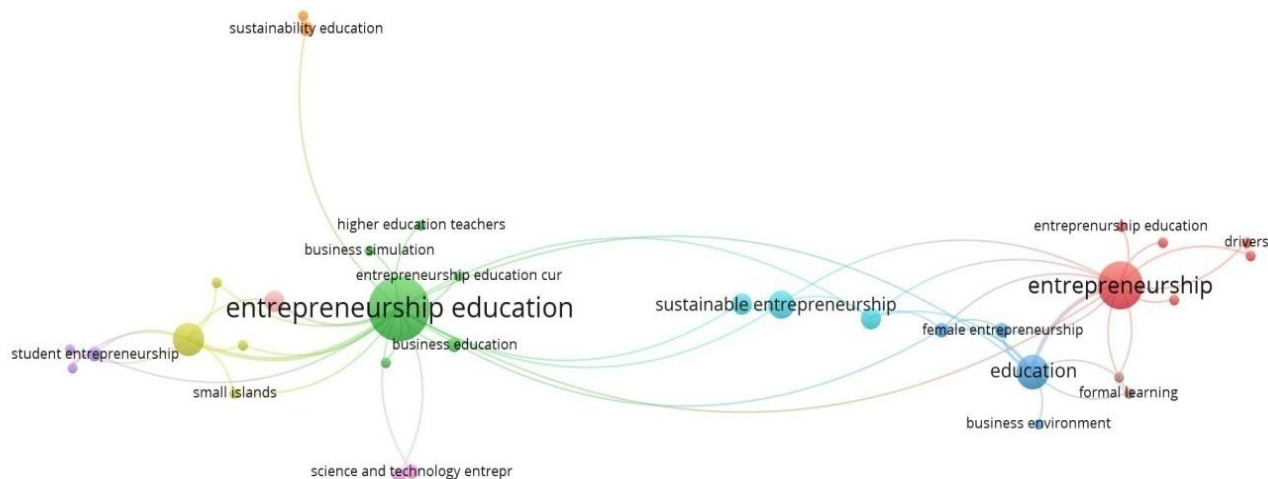


Figure 1 Keywords connection network.

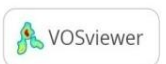
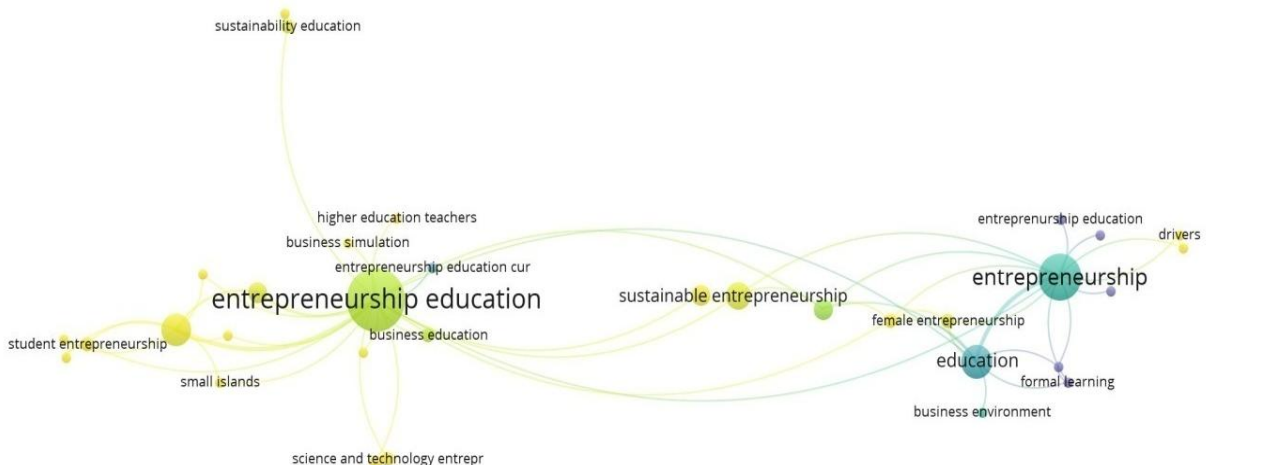


Figure 2 Network visualization map of keywords related to the topic of entrepreneurship education.

Cluster 2 – Green. In the green cluster, the significance of the connection between research on entrepreneurship education and business sustainability was highlighted (Harkema & Popescu, 2015), emphasizing its impact on the mental mindset related to business sustainability (Haddoud et al., 2024). Entrepreneurial ventures addressing social and environmental issues have significantly increased, alongside closely related research streams and academic discussions surrounding social and sustainable entrepreneurship (Bonfanti et al., 2024). Additionally, studies explore the influence of



entrepreneurial learning in relation to business ventures across various phases of business growth (He et al., 2024). The sustainability of businesses can be maximized when supported by both formal and nonformal entrepreneurship education (Rocha et al., 2024). Entrepreneurship has been a central focus of business research because of its role in driving positive change and enhancing economic resilience, whereas sustainable entrepreneurship, which incorporates triple-bottom-line principles, has gained increasing institutional support (Avelar et al., 2024). (Hogenstijn & Cuypers, 2023) offer fresh perspectives on entrepreneurial learning (EE) for children by incorporating three essential components that take the entrepreneurial education literature toward a new perspective: (1) an emphasis on social and sustainable business ventures; (2) primary education as the learning environment; and (3) an emphasis on the impacts understood by the children themselves.

According to (Watson et al., 2023), eco-conscious business ventures can support eco-friendly progress by creating interactions among social, environmental, and economic results, transforming market shortcomings into entrepreneurial prospects. Nevertheless, regulatory circumstances often hinder eco-conscious business innovators. Although regulations play a crucial role in shaping the environment for entrepreneurship, research on how policy can specifically encourage eco-friendly enterprises is limited. Sustainable entrepreneurship (SE) has arisen as a distinct field within business ventures that integrates both entrepreneurial and sustainability aspects (Crecente et al., 2021) and (Muñoz & Cohen, 2018).

Cluster 3 – Blue. In the blue cluster, research connections were identified between entrepreneurship and entrepreneurship education (Haneberg et al., 2022), (He et al., 2024) and (Janowski & Szczepańska-Przekota, 2024) as well as between entrepreneurship and education and between entrepreneurship and environment-based businesses (Choi & Markham, 2019) and (Mambali et al., 2024). Additionally, links between entrepreneurship and women's businesses (Narmaditya et al., 2023), entrepreneurship and formal learning (Hogenstijn & Cuypers, 2023) and (Byun et al., 2018) and entrepreneurial effectiveness in business (Byun et al., 2018) and (Oulhou & Ibourk, 2023) have been explored. However, research focusing on entrepreneurship education in the last five years (2016–2024) remains scarce. This gap presents an opportunity for future researchers to delve into sustainable entrepreneurship education.

A study highlighting the importance of sustaining entrepreneurship through entrepreneurship education (Malik et al., 2023) emphasized that entrepreneurial learning has evolved into increasingly vital learning in recent years. This trend is closely linked to global efforts to promote value generation, career readiness, and employment opportunities. Participating in entrepreneurial education prepares students with the essential skills to create viable and lucrative solutions for evolving challenges. (He et al., 2024) confirm that entrepreneurship education significantly improves the success of existing businesses by strengthening entrepreneurs' self-perceived abilities and potential prospects. These insights contribute to ongoing studies on the effects of entrepreneurial learning across various stages of business development.

4. Trending topics.

In this section, we analyze the current research directions and trends. The research starts by examining the frequency of specific key terms in the text. In other words, keywords provide a visual representation of the paper's main topics. As the frequency of a term increases, its size also increases, as shown in Figure 1, which illustrates its occurrence within our study database. On the basis of the analysis of Figure 1, the following are the most significant keywords:

1. Entrepreneurship education
2. Entrepreneurship education Cur
3. Student Entrepreneurship
4. Business Simulation
5. Higher Education Teachers
6. Science and Technology Entrepr
7. Sustainability Education
8. Entrepreneurship
9. Education
10. Formal Learning
11. Female Entrepreneurship

The variation in keywords over time is another useful method for analyzing trending research directions. Figures 1 and 2 illustrate the trending keywords and their growth over the years, respectively. Based on these figures, we can draw the following conclusions:

In 2016, topics such as entrepreneurship, formal learning, female entrepreneurship and the business environment became the most frequently discussed areas, whereas research on entrepreneurship education was rarely addressed.

From 2017 – 2024, the most trending topics were entrepreneurship education, the entrepreneurship education curriculum, student entrepreneurship, business simulation, higher education teachers, and science and technology entrepreneurship. However, sustainability in entrepreneurship education has rarely been explored.

In conclusion, sustainability in entrepreneurship education is a topic that has seldom been studied by researchers globally. This finding indicates that the subject holds significant potential for further development in ongoing research efforts (Table 1).

Table 1 Important empirical research in the area of entrepreneurship education literature.

Article	Purpose	Findings
Entrepreneurship education and entrepreneurial behavior: Do self-efficacy and attitude matter? (Al-Qadasi et al., 2024)	The study explored how university students' perspectives on entrepreneurship education (ATEE) influence their entrepreneurial intentions. It specifically looked at the direct effects of ATEE (including behavioral, affective and cognitive components, along with the indirect influence of attitudes toward entrepreneurship (ATE) and entrepreneurial self-efficacy (ESE) on entrepreneurial intention (EI).	The study's findings revealed that the model accounted for 52% of the variance in entrepreneurial entrepreneurial intention (EI). Attitude toward entrepreneurship education exhibited both a notable direct influence on EI and an indirect effect, suggesting that Entrepreneurial attitudes and self-efficacy in entrepreneurship partially mediate this relationship.
Can entrepreneurship education activities promote students' entrepreneurial intention? (Overwien et al., 2024)	Entrepreneurial learning initiatives are designed to foster business venture development., but previous studies on their effect on students' entrepreneurial intentions (EI) have produced mixed results. Expanding in this study, our exploratory research investigates the connection among academic curricula EEA and extracurricular EEA—specifically startup talks, workshops, and startup competitions—and how they influence participants' EI.	The study revealed that the entrepreneurial intentions (EI) among learners who took part students engaged in curricular EEA or startup competitions as part of assessment-based activities showed no significant differences compared to those who did not participate in any EEA..
The effects of an education program on social and sustainable entrepreneurship for primary school children. (Hogenstijn & Cuypers, 2023)	This paper offers fresh perspectives on entrepreneurship education (EE) for children by incorporating three elements that take the EE literature in a new focus: (1) the curriculum highlights social and sustainable entrepreneurship, (2) the educational context examined is elementary education, and (3) the emphasis is on the effects as experienced by the children who participated.	The findings suggest that a program centered on sustainable and social entrepreneurship may yield different outcomes compared to more 'general' entrepreneurship programs, especially when considering differences between girls and boys.
Factors influencing sustainable entrepreneurship in fisheries small and medium-sized enterprises in Tanzania. (Salehe et al., 2024)	This paper aims to identify the factors that influence sustainable entrepreneurial activities in small and medium-sized businesses within the fishing industry. Quantitative data were gathered from 390 entrepreneurs involved in the Nile perch fishery at Lake Victoria, Tanzania.	The results showed that entrepreneurs exhibit a strong level of eco-friendly entrepreneurial behavior but feel there is insufficient government support. Key factors such as entrepreneurs' values, innovativeness, proactiveness, and the presence of rules and regulations were found to have a significant impact on sustainable entrepreneurship within the fishery industry.
Entrepreneurship education and entrepreneurial intentions: Do entrepreneurial self-efficacy, alertness and opportunity recognition matter? (Otache et al., 2024)	This study investigates the serial of the intermediary role of entrepreneurial self-efficacy, alertness, and opportunity recognition in the relationship between entrepreneurship education and entrepreneurial outcomes intentions.	The findings indicate that entrepreneurship education significantly enhances students' confidence in entrepreneurship, awareness, opportunity identification, and business venture development intentions.
Entrepreneurship education through sustainable value creation – exploring a project introducing circular economy. (Bragelien & Voldsund, 2023)	Investigated the growing focus on sustainability and the gradual incorporation of circular economy principles in educational environments that promote entrepreneurial learning and the creation of sustainable value.	The key findings are: (1) the circular economy (CE) provides a shared framework and platform for practical sustainability examples in entrepreneurship education (EE); (2) CE and examples of sustainable practices can be complex and require streamlining; and (3) open-ended circular economy cases necessitate partnership with external entities, highlighting the need for more structure.
How does digital entrepreneurship education promote entrepreneurial intention? The role of social media and entrepreneurial intuition. (Wibowo et al., 2023)	This study investigates the relationship of the relationship between digital entrepreneurship education and digital entrepreneurial intention among students in Indonesia, taking into account the intermediary effects entrepreneurial instincts and social media platforms use.	This research emphasizes the importance of integrating digitalization into entrepreneurship to enhance students' entrepreneurial intentions and behaviors.

Exploring inclusivity in entrepreneurship education provision: A European study. (Henry et al., 2024)	This paper investigates inclusivity in the provision of entrepreneurship education (EE). This research is significant due to the global expansion of EE and the goal of making it a discipline and skill accessible to all.	The work enhanced the current literature in this field by highlighting the importance of inclusivity in EE programs, suggesting a modified version of an existing inclusivity assessment tool as an initial step for HEIs on their inclusivity path, and providing insights aimed at strengthening HEIs' efforts to improve inclusivity in EE.
A study examining the impact of entrepreneurial attitudes and education on entrepreneurial intention. (Ince et al., 2023)	Examined the impact of entrepreneurial attitude and education regarding the formation of entrepreneurial intention.	The research revealed that perceived consistency and perceived effectiveness exert a substantial influence on entrepreneurial intention. Additionally, It was discovered that perceived appropriateness, perceived alignment, and entrepreneurial intention vary notably among students with prior work experience and those without.
Assessment and development of coachability in entrepreneurship education. (Somià et al., 2024)	With coaching and alumni mentoring utilized to cultivate student startup talent, student coachability becomes a key factor in supporting reflection and action-based learning methods in entrepreneurship education. However, there is limited research on evaluating and fostering coachability, particularly in the context regarding entrepreneurship education. This study seeks to address that gap.	Our exploratory research demonstrates a positive correlation between coachability and educational outcomes, highlighting the importance of competencies like self-awareness and flexibility. It also revealed that coachability can be cultivated through experiential education, that fosters the enhancement of abilities like applying learning to action and taking initiative..
A Study on the Effectiveness of Entrepreneurship Education Programs in Higher Education Institutions: A Case Study of Korean Graduate Programs. (Byun et al., 2018)	The aim of this study is to evaluate the impact of entrepreneurship effectiveness curriculum and Learning initiative as perceived by students and graduates.	The research analysis revealed a difference in academic framework and educational program preferences between current postgraduate learners and alumni. The findings of the study offer both theoretical and real-world implications.
Does expansion of college education benefit urban entrepreneurship and innovation in China? (H. Zhang et al., 2023)	This study empirically assesses the mean impact of the intervention of China's entrepreneurial ecosystem (ECE) on urban entrepreneurship and innovation (E&I), including its geographic diffusion effects. It also examines two intermediary factors skill development and workforce inefficiency to uncover how China's ECE influences urban E&I.	The findings confirm with high relevance and reliability that the ECE for both undergraduate and graduate students have a vital role in urban entrepreneurship and innovation, Especially in urban areas situated in the eastern or northeastern economic regions, urban areas featuring populations under five million, or those lacking "Mass Innovation and Entrepreneurship Demonstration Bases." Additionally, the study verifies the existence of both the "Matthew effect" and the spatial "beggar-thy-neighbor" effect of ATE driven by the ECE.
Drivers and inhibitors of entrepreneurship in Europe's Outermost Regions: Implications for entrepreneurship education. (Almeida & Garrod, 2024)	This study explores the factors that encourage and hinder entrepreneurial intentions among young individuals in madeira, a self-governing region peripheral territory of Portugal.	The results indicated that students with limited access to startup financing and a heightened fear of failure generally exhibited the lowest entrepreneurial intentions. Additionally, entrepreneurs' offspring demonstrated notably greater determination to pursue entrepreneurship themselves. Furthermore, entrepreneurial intention significantly grew alongside the students' age.
Creating a Corporate Entrepreneurial Ecosystem: The Case of Entrepreneurship Education in the RTP, USA. (Choi & Markham, 2019)	This paper examines the collaboration between industry and universities in preparing students developing corporate entrepreneurial mindsets. The study is grounded in a comprehensive review of literature and reports, along with in depth interviews conducted involving 28 individuals across different sectors within the Research Triangle Park, encompassing businesses, governmental organizations, and various initiatives spanning multiple universities.	The key finding of this research highlights that the robustness of entrepreneurship training within the local innovation framework enhances businesses' capacity for collaborative innovation and improves their overall effectiveness.
Entrepreneurship education and business and science	This study examines how confidence in sustainable entrepreneurial abilities and	The outcomes of a multigroup analysis indicated notable variations in specific hypothesized

<p>students' green entrepreneurial intentions: The role of green entrepreneurial self-efficacy and environmental awareness. (Mambali et al., 2024)</p> <p>Entrepreneurship education in Poland: Contemporary problems and future opportunities. (Janowski & Szczepańska – Przekota, 2024)</p>	<p>environmental awareness affect the connection between entrepreneurship education and green business startup aspirations within the student community in both business and science fields.</p> <p>Polish educational institutions, irrespective of their educational level, struggle to adapt to shifts in the market and the demands of market attendees concerning transmission of entrepreneurial expertise, highlighting an absence of flexibility in contemporary educational methods. This analysis aims to investigate the elements leading to inefficiency of entrepreneurship learning system in Poland and to formulate Suggestions for enhancing learning results in the future.</p>	<p>relationships between business and science students, with science students demonstrating stronger effects than their business peers. These results hold.</p> <p>This research suggests that adopting an application-focused method in the redesign In entrepreneurship education programs ought to be a key component of polish higher education policy, as it will lay the groundwork for upcoming research endeavors in this area.</p>
<p>The temporal development of teachers' attitudes on entrepreneurship education – A latent growth curve analysis. (Joensuu-Salo et al., 2024)</p>	<p>This study examines the perspectives of educators at Finnish Universities of Practical Studies regarding the significance and appeal in entrepreneurial education, as well as the consistency of these perspectives over a span of three years.</p>	<p>The results highlight the significance of providing early career support and entrepreneurship training for educators.</p>
<p>Forecasting students' adaptability in online entrepreneurship education using modified ensemble machine learning model. (Malik et al., 2023)</p>	<p>This study introduces a machine learning approach designed to predict students' adaptability levels in online entrepreneurship education.</p>	<p>The findings of this research enhance the field of online entrepreneurship education by offering a dependable and effective method for predicting students' adaptability.</p>
<p>Entrepreneurial implementation intention: The role of psychological capital and entrepreneurship education. (Haddoud et al., 2024)</p>	<p>This research explores the mediating the influence of psychological assets in the relationship the connection between entrepreneurial training and business-oriented actions.</p>	<p>The findings indicate that although psychological capital partially mediates the influence of entrepreneurship education on entrepreneurial intention, this effect is mainly driven by hope and self-efficacy, with hope having a more significant impact.</p>
<p>Entrepreneurship education and established business activities: An international perspective. (He et al., 2024)</p>	<p>This article presents a theoretical framework in which recognized opportunity and assessed competence act as intermediary factors in how entrepreneurship education enhances established business activities.</p>	<p>This confirms that entrepreneurship education significantly enhances The success of existing enterprises by supporting entrepreneurs in enhancing their perceived competencies and opportunities.</p>
<p>Entrepreneurship education as first-person transformation: Interiority as an operationalizing mechanism. (Nzembayie & Coghlan, 2024)</p>	<p>This paper proposes interiority as a practical mechanism for fostering entrepreneurship through first-person transformation.</p>	<p>This approach enhances meaningful entrepreneurial learning, as evidenced by the development of entrepreneurial mindsets in students' reflective practices.</p>
<p>Perceived effectiveness of entrepreneurship education, entrepreneurial mindset, entrepreneurial self-efficacy and entrepreneurial intention among Moroccan university students: A correlational study. (Oulhou & Ibourk, 2023)</p>	<p>This research seeks to examine the connection among four entrepreneurship associated variables the acknowledged impact of entrepreneurship education, entrepreneurial mindset, self-confidence, and aspirations among Moroccan university students, taking into account their field and level of education.</p>	<p>The findings indicate that the effectiveness and perceived satisfaction of entrepreneurship education play a crucial role in fostering an entrepreneurial mindset and intention among students.</p>
<p>Teaching and facilitating action-based entrepreneurship education: Addressing challenges toward a research agenda. (Haneberg et al., 2022)</p>	<p>The purpose of this paper is to tackle ongoing controversies surrounding venture creation programs and provide research-based recommendations for addressing key challenges.</p>	<p>The results emphasize 3 key aspects that pose obstacles for instructors: (1) supporting learners in their business startup procedures, (2) evaluating learners' tasks related to real-world activities, and (3) managing interactions in collaboration with external partners.</p>
<p>The lagged effect of university-based entrepreneurship education on employees'</p>	<p>This study examines the delayed impact of entrepreneurial training within universities on employee retention in Chinese entrepreneurial startups.</p>	<p>These results additionally confirm the delayed impact of entrepreneurial training in colleges and universities, offering valuable insights for</p>

retention at entrepreneurial startups. (Li et al., 2024).		enhancing entrepreneurship education and managing employees at startups.
Redefining entrepreneurship education in the age of artificial intelligence: An explorative analysis. (Vecchiarini & Somià, 2023)	This paper examines the possibility applications of Chat GPT in tertiary education, particularly in entrepreneurship courses, and discusses the benefits and challenges related to its implementation.	The study's findings suggest that ChatGPT can enhance efficiency, streamline processes, and foster specific forms of creativity among students. The article also raises concerns about the accuracy and reliability of ChatGPT, highlighting the need for critical usage.
Revealing three anomalies: Extending Kolb educator roles profile in experiential entrepreneurship education. (Larsen et al., 2024)	This paper is one of the initial to both confirm and critically examine the Kolb Teaching Role Framework in the framework of hands-on entrepreneurial learning.	The conventionally established teaching roles in the KERP classification include: (1) teachers must facilitate tangible experiences, (2) instructors must oversee learners' exposure to hands-on entrepreneurial skills, and (3) instructors must encourage students to engage in Business innovation.

4. Conclusions

This study employs bibliographic analysis to identify new insights into the emerging gaps in ongoing research related to the significance of entrepreneurship education. It also explores recent issues in the field and highlights research findings on entrepreneurship education from 2016 -2024 while offering an overview of the future research landscape. As such, this research contributes to the understanding of existing academic debates surrounding entrepreneurial activity education. Furthermore, the review analyzes 182 articles from 2016 - 2024, all of which are indexed in Scopus, indicating that only a limited number of studies have explored this topic. Consequently, there remains ample opportunity for future researchers to expand on entrepreneurship education research. Findings revealed three core research clusters: the integration of entrepreneurial principles into educational systems, the drivers and intentions behind social entrepreneurship, and the challenges and skill development within Training in entrepreneurial skills. Furthermore, the study highlighted the diverse impacts of Training in entrepreneurial skills on students, such as the role of entrepreneurial intentions in startup success, the influence of This type of training in entrepreneurial skills and intentions, the development of effective educational strategies, and the analysis of factors shaping university students' entrepreneurial intentions. By exploring these areas, the research seeks to enhance entrepreneurship education and deepen understanding in the field.

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Ethical considerations

This research relies on a thorough literature review to gather data and reference sources, eliminating the need for an ethical statement. However, the integrity of the researcher is expected to play a crucial role in accurately identifying and utilizing reference sources in this study.

Conflict of interest

The authors state that they have no conflicts of interest.

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