

Exploring Sustainable Entrepreneurship: A Systematic and Bibliometric Study on Startup Success in the Era of Innovation

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Abstract

This paper investigated the development of studies on sustainability entrepreneurship inside the digital innovation framework using an intense Bibliometric evaluation and Systematic Literature Review (SLR). The look addresses questions on the evolution of sustainability entrepreneurship research, thematic developments, and validating a formulated conceptual version using the Scopus database from 2000 to 2025. The results reveal that a strong focus on sustainability significantly improves startup performance and that digitalization is essential for maximizing resource efficiency and enhancing sustainability practices' impact on startup performance. Examining a conceptual model helps one to see how dynamically Sustainability Orientation, Organisational Culture, and Digitalisation interact to improve startup outcomes. Using a systematic literature review, sustainable entrepreneurship and innovation within the virtual age were examined, key trends were identified, and several study gaps were diagnosed. Considering digital changes, further studies may focus mainly on organizational subculture and the opportunities for additional research on sustainable practices in startups. The study results could give policymakers and business leaders positive steerage and ideas on creating a thriving startup environment specializing in sustainability because of the digitalization trend.

Keywords

Digitalization, Organization culture, Startup, Sustainable entrepreneurship.

INTRODUCTION

Sustainable entrepreneurship is considered important for integrating economic and social goals with environmental concerns, which the government can enhance through the moral obligation of companies in business or the public-private initiatives developed by institutions. It assists in lessening environmental issues by promoting innovation, decreasing uncertainty, and facilitating the proper use of resources more effectively than by regulations, enabling the industry to find a better sustainable solution [1]. An industry life cycle, product and process innovation, and market fluctuation are significant factors that every startup concern needs to consider while developing sustainability innovation [2]. Because these companies embed sustainability at the heart of their strategic operations, they can fulfil ever-evolving consumer expectations while strengthening their competitive advantages in turn [3].

The impact of digital transformation on sustainable entrepreneurship increasingly permeates through technology solutions that improve operational efficiencies while reducing environmental footprints [4]. Digital transformation changes how business models and organizational strategies are created to make startups more sustainable by making better data-driven decisions, operationally more efficiently, and optimizing resources [5]. In addition, coupled with sustainable practices, digital practices can enable startups to pass through difficult market territories in a better way,

offering innovative responses to global ecological problems [6].

SLRs and bibliometric analyses are vital to the growing academic debate on sustainable entrepreneurship, as these approaches put forward precious insight into crucial trends, predominant themes, and knowledge gaps in the field of study [7]. Therefore, these methods provide a structured overview of how sustainability and digital transformation influence entrepreneurial performance. The study therefore extends existing literature by analyzing such relationships and presenting a conceptual model that may underline how digital tools, sustainability focus, and organizational culture drive startup success. The current findings synthesized in the present research provide an input requirement for scholars, entrepreneurs, and policy planners committed to fostering sustainable growth in the startup ecosystem.

Objectives of the Study

This study primarily aims to provide a comprehensive overview of contemporary research on sustainability within startup performance, specifically in the context of digital transformation. It examines how sustainable practices influence entrepreneurial success in the digital age, guided by the following research questions (RQs):

RQ1: How has the literature on startup success and sustainability changed between 2000 and 2025?

RQ2: Based on keyword co-occurrence and network visualization techniques, what are the key themes of sustainable entrepreneurship and how are they related?

RQ3: In what ways does the conceptual model illustrate the connections between organizational culture, digital transformation, startup performance, and sustainability?

RQ4: What are the emerging characteristics and current research gaps that may influence future scholarly investigations?

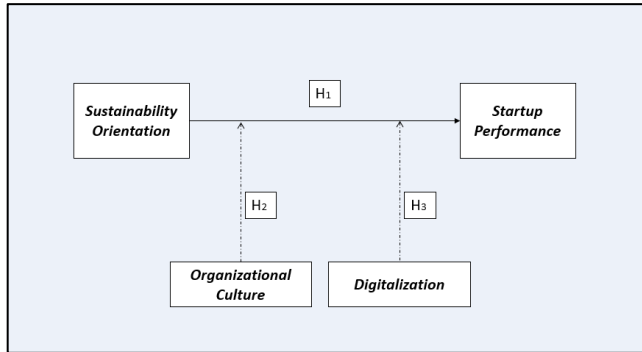


Figure 1. Hypothesized Conceptual Model

The following hypotheses are framed to verify the conceptual model.

H₁: There is a significant positive association between Sustainability Orientation and Startup Performance

H₂: Organizational Culture moderates the positive association between Sustainability Orientation and Startup Performance

H₃: Digitalization moderates the positive association between Sustainability Orientation and Startup Performance

METHODOLOGY

Database Selection

A systematic literature review approach was adopted here to ensure the coverage, comprehensiveness, and reproducibility of the review on sustainable entrepreneurship and digital innovation. SLRs provide condensed reviews of voluminous literature, underlining knowledge gaps since these are methodologically robust [8]. The Scopus database was chosen because of its credibility and wide coverage of peer-reviewed journals in business and management disciplines. Scopus is especially preferred over other databases in conducting systematic reviews in entrepreneurial and innovation studies due to its broad indexing and high-impact scholarly content [9].

Search Strategy

A refined search strategy using Boolean logic has been developed to capture relevant studies on sustainable entrepreneurship.

Search Query: TITLE: ("sustainable entrepreneurship" OR "startups") AND ("innovation" OR "technology" OR "digital transformation") AND ("sustainability" OR "social responsibility").

The raw outcome of the initial search was 1,537 articles, spanning the period from the year 2000 up to 2025. Successive refinements were made: first, narrowing the results down to a peer-review journal article type brought the

total down to 878; then narrowing to English-language publications resulted in 854. A final filter, allowing only those at the "final" publication stage, resulted in 814 records.

Filtering Process

The set of articles was systematically screened, reducing it to 541 relevant abstracts based on explicit criteria:

Inclusion Criteria: Studies had to empirically examine sustainable entrepreneurship, startup success factors, or aspects of digital transformation. They needed to be published in English between 2000 and 2025 and contain key terms such as "sustainability," "startup ecosystem," or "digital transformation."

Exclusion Criteria: Articles were excluded if they addressed unrelated subjects, were theoretical or review-based rather than empirical, or lacked sufficient empirical evidence. Duplicates and abstracts that did not clearly articulate the study's relevance or focus were also removed.

Data Screening and Analysis

The author reviewed each abstract to verify its relevance to the research objectives. Titles and abstracts that failed to satisfy the inclusion criteria were methodically excluded. The refined dataset, comprising 541 articles, was subsequently analyzed to identify recurring themes, significant variables, and gaps in the literature, thereby revealing prevalent research topics and opportunities for future exploration.

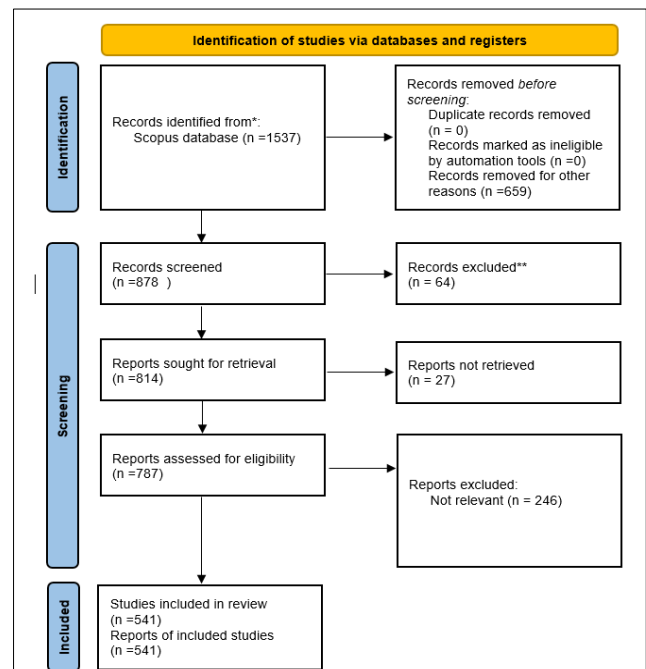


Figure 2. PRISMA Flowchart (Page et al., 2021)

MAIN INFORMATION

Table 1: Main Information

| Description | Results |
|------------------------------------|-----------|
| MAIN INFORMATION ABOUT DATA | |
| Timespan | 2000:2025 |
| Sources (Journals, Books, etc) | 273 |
| Documents | 541 |
| Annual Growth Rate % | 0 |
| Document Average Age | 3.64 |
| Average citations per doc | 28.97 |
| References | 0 |
| DOCUMENT CONTENTS | |
| Keywords Plus (ID) | 1415 |
| Author's Keywords (DE) | 1753 |
| AUTHORS | |
| Authors | 1473 |
| Authors of single-authored docs | 81 |
| AUTHORS COLLABORATION | |
| Single-authored docs | 84 |
| Co-Authors per Doc | 2.96 |
| International co-authorships % | 26.06 |
| DOCUMENT TYPES | |
| article | 541 |

"Exploring Sustainable Entrepreneurship: A Systematic and Bibliometric Study on Startup Success in the Era of Innovation" looks at data from 25 years, from 2000 to 2025. It has 541 files from 273 academic platforms, such as books, journals, and other scholarly repositories. If you look at the average number of citations per document, which is 28.97, you can see that the educational field has a lot of impact, even though it only grows by 0% each year. The files are also three years old on 3.64 years, which suggests that the research is surprisingly up-to-date and still very important.

Researchers looked at a lot of different topics and ideas. They used 1,415 Keywords Plus keywords and 1,753 author-supplied keywords to show how broad the studies are. There are 1,473 authors who have contributed to this topic, but only 81 of them have written works by themselves. This shows how common collaborative research is. A mean of 2.96 co-authors who are all in agreement with the document also backs this up. It's also clear that people from all over the world work together; 26.06% of the courses have co-authors from different countries, showing that the global research network is stable.

The fact that 541 scholarly articles make up most of the dataset suggests that peer-reviewed journal articles are the most important way for people in this region to share knowledge. Focussing on a single type of guide could also show a focused approach to sharing research, with a focus on producing very good educational output.

RESULTS AND DISCUSSIONS

Verification of Conceptual Model

Extensive research has demonstrated that sustainability orientation positively influences startup performance. Celestin et al assert that eco-innovations in the recycling sector have significantly improved SMEs' operational efficiency and business performance [10]. It is assert that sustainability-driven entrepreneurial capital is essential for organizations to enhance their resilience and attain long-term growth [11]. However, studies can show how sustainable entrepreneurial strategy and competitive elements are in place in an exhibition sector for exceptional business performance [12]. A 2024 study used data envelopment analysis to show that adopting environmentally sustainable practices enhances entrepreneurial efficiency and improves economic performance [13]. The study discusses, discussed how sustainability-oriented entrepreneurs can surmount hindrances and turn risks into success opportunities [14].

Further studies have also pointed out the benefits of sustainability practices. According to Rasheed et al., startups that practice green supply chain management benefit from increased profitability and customer satisfaction [15]. The study in 2022 insightfully highlights how sustainability practices will reduce operational costs and improve productivity [16]. As explained by Watson et al., 2023, a greater competitive advantage is created because sustainability practices differentiate or make a product or service different in the market [17]. A 2024 study highlights that startups committed to environmental stewardship tend to receive greater government incentives and funding, which in turn boosts their overall performance [18]. Furthermore, 2023 study advocate that sustainability is crucial for promoting innovation and stimulating economic growth, underscoring the significance of a sustainability-focused strategy for the success of startups [19].

In broad terms, the more developed the Organizational Culture within a company, the more developed the indicators of Sustainability Orientation and Startup Performance. A 2024 study considers that when functioning independently, organizational culture plays a vital role in enhancing the positive impacts of social entrepreneurship in practice, thereby contributing to improved outcomes in project implementation [21] A 2022 study point out that happiness management as a mechanism of organizational culture contributes to employee retention and creative behavior, which in turn reinforces the implementation of sustainability strategies [21]. Several recent studies stress that organizations experiencing ecological challenges are well positioned culturally due to an organization's relative culture of innovation fosters sustainability enhancing potential operational performance [22]. 2023 research explain ways in which enhanced performance is achieved through effective cultural positioning including artificial intelligence which is integrated into sustainability related strategic executions [23]. 2020 study assess the relevance of adaptive strong resilient cultures while in the face of uncertainties

encompassing more of the reason to have a strong organizational culture for sustainability benefits [24]. 2024 study indicate that such a culture encourages and strengthens the benefits of innovations which are sustainable as well as those that are technology led, digital innovations [25]. Similarly, cultural differences are shown to significantly influence how organizations utilize social media marketing within their operations [26].

Research findings in the literature show that technology tools can be beneficial in embedding sustainability practices in the startup. In the essence, Rodrigues et al., 2023 show that there is an improvement in the effective deployment of the resources as a result of the digitization and this further advances the sustainable goals and concurrently enhances the efficient operation which is critical for the startups [27]. In a similar case, 2024 study advances advance the same view in a consistent contribution towards an enhanced understanding of the challenges faced by the combiners of effective digitalization strategies and sustainability objectives at the startup and therefore are able to respond to environmental opportunities more effectively improving the resilience and performance exposure of the startup [24].

Further, research in 2024 also focus on the adoption of digital innovations and their impact on startup organizations which tend to expose their operations to more sustainable, energy-saving and zero waste operations which in turn enhances the startup performance [28]. It is also obvious, as 2023 study has stressed, that as the digital tools facilitate effective scale-up of the sustainability activities, there will also be improved interactions and effectiveness in the operational processes which will consequently lead to the achievement of the success of the startup. These findings collectively suggest that digitalization enhances sustainability orientation and strengthens its beneficial effects on performance metrics, offering strong support for the proposed moderating hypothesis [29].

Based on the literature review, the researcher concludes that

1. There is a significant positive association between Sustainability Orientation and Startup Performance.
2. Organizational culture influences the positive relationship between Sustainability Orientation and

Startup Performance.

3. Digitalization influences the positive relationship between Sustainability Orientation and Startup Performance.

Annual Scientific Production

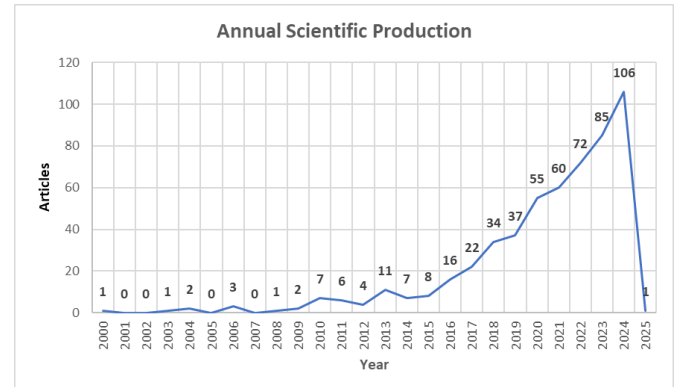


Figure 3: Annual Scientific Production

The course of yearly scientific contribution in the domain of sustainable entrepreneurship reflects a steady increase, indicating a rise in academic activities in this field. From 2000 to 2008, the level of research activity was rather low, with one, or no publications per year signifying poor interest from the scholars. However, starting from 2009, a slow rising trend was noticeably observed, but with slight up and down cycles, that lasted until 2015.

This trend was quickly followed by an overall increasing trend which culminated in a dramatic increase in publication volume of articles in the year 2016. Thereafter, the volume of publications each year until the year 2024 continued to escalate with the highest volume of 106 articles being published that year. This trend of sustained volume growth demonstrates the evolving nature of the field propelled by growing technological advancement and digital developments. The general trend is indicative of the rising prominence of the field of sustainable entrepreneurship in academic discussion, which reflects current research trends in innovation and business ideas with social responsibility.

Most Cited Documents

Table 2: Most Globally Cited Documents

| Paper | DOI | Total Citations | TC per Year | Normalized TC |
|---|--------------------------------|-----------------|-------------|---------------|
| SCHALTEGGER S, 2011, BUS STRATEGY ENVIRON | 10.1002/bse.682 | 1168 | 83.43 | 5.62 |
| SCHOT J, 2018, RES POLICY | 10.1016/j.respol.2018.08.011 | 967 | 138.14 | 13.88 |
| YORK JG, 2010, J BUS VENTURING | 10.1016/j.jbusvent.2009.07.007 | 506 | 33.73 | 3.22 |
| HWEE NGA JK, 2010, J BUS ETHICS | 10.1007/s10551-009-0358-8 | 476 | 31.73 | 3.03 |
| SCHALTEGGER S, 2016, ORGAN ENVIRON | 10.1177/1086026616633272 | 475 | 52.78 | 9.17 |
| GEORGE G, 2021, ENTREP THEORY | 10.1177/1042258719899425 | 366 | 91.5 | 15.61 |

| Paper | DOI | Total Citations | TC per Year | Normalized TC |
|---|--------------------------------|-----------------|-------------|---------------|
| PRACT | | | | |
| TODESCHINI BV, 2017, BUS HORIZ | 10.1016/j.bushor.2017.07.003 | 341 | 42.63 | 5.99 |
| BOCKEN NMP, 2018, ENVIRONMENTAL INNOVATION AND SOCIETAL TRANSITIONS | 10.1016/j.eist.2018.02.001 | 319 | 45.57 | 4.58 |
| MUÑOZ P, 2017, TECHNOL FORECAST SOC CHANGE | 10.1016/j.techfore.2017.03.035 | 286 | 35.75 | 5.03 |
| HENRY M, 2020, J CLEAN PROD | 10.1016/j.jclepro.2019.118528 | 251 | 50.2 | 6.25 |

Citations in sustainable entrepreneurship research show many influential works. A highly cited 2011 article published in *Business Strategy and the Environment* has garnered 1,168 citations, reflecting its significant influence in the field. Following this, a notable 2018 paper in *Research Policy* demonstrates its academic impact with an impressive annual citation rate of 138.14 and a normalized total citations (TC) score of 13.88, underscoring its instructional and scholarly relevance.

Two influential 2010 studies—one published in the *Journal of Business Venturing* and the other in the *Journal of Business Ethics*—each have received over 470 citations, highlighting the importance of both strategic and ethical dimensions in the field of entrepreneurship. Additionally, a 2016 article in *Organization & Environment*, with 475 citations and a normalized total citations (TC) score of 9.17, further reflects the scholarly impact and ongoing relevance of sustainability-oriented research within organizational studies.

A notable 2021 publication in *Entrepreneurship Theory and Practice* achieved a normalized total citation (TC) score of 15.61, reflecting a rapid surge in scholarly attention. Similarly, influential studies published in 2017 and 2018 demonstrated exceptional academic impact, contributing significantly to the discourse on sustainable business practices [30]. [31] Further research from 2017 and 2020 reported normalized TC scores of 5.03 and 6.25, respectively, underscoring their relevance and sustained influence in the field [32]. [33] [34].

Co-occurrence of Keywords

In the have a look at of sustainable entrepreneurship and startup success, "sustainable development" and "sustainable entrepreneurship" are the most commonly mentioned keywords, emphasizing their significance. The assessment suggests seven thematic clusters with unique colourings that spotlight research topics.

Cluster 1 (Red) emphasizes "technological innovation," "economic sustainability," and "environmental protection," emphasizing the importance of era and cash in sustainable and socially responsible practices.

Cluster 2 (Green) discusses "commercial enterprise organization development," "ecosystems," and "technological improvement," assessing organization

dispositions and ecosystems through systematic literature evaluations and bibliometric assessment.

Cluster 3 (Blue) discusses "policymaking," "stakeholder," and "environmental economics," displaying how recommendations and stakeholder involvement have an effect on sustainable entrepreneurship, especially in education and marketing.

Cluster 4 (Purple) discusses how social networks and global sustainability dreams have an impact on SMEs with phrases like "small and medium-sized businesses (SMEs)," "social capital," and "SDG" (Sustainable Development Goals).

Cluster 5 (Orange) emphasizes "expertise," "funding," and "bioeconomy," emphasizing the want for an information-driven economic system and strategic investments to pressure sustainability-driven innovation.

Cluster 6 (Yellow) emphasizes "agency corporation," "sustainability-oriented innovation," and "gaining knowledge of," demonstrating how organizational and academic practices promote sustainable innovation.

Finally, Cluster 7 (Cyan) discusses "literature evaluation," "entrepreneurial ecosystems," and "digital transformation," emphasizing digital alternate and surroundings dynamics in sustainable entrepreneurship.

These clusters exhibit the area's interdisciplinary nature and align with the observe's Sustainability Orientation, Innovation & Technological Progress, and Startup Ecosystem framework. Financial, technological, environmental, and social elements have an effect on startup fulfilment, and the assessment identifies new research and coverage regions.

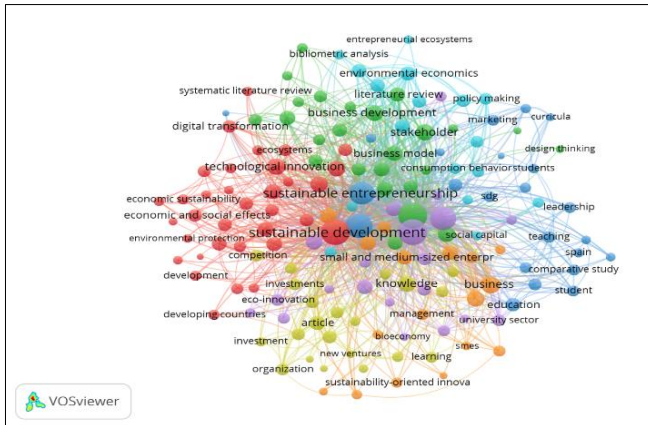


Figure 4. Co-occurrence of Network Keywords

Research Gap and Practical Implications

The bibliometric analysis reveals significant research gaps and emerging trends that are likely to influence future studies on sustainable entrepreneurship and startup success. It is important to note that there are gaps in the software of advanced digitalization strategies, particularly in the context of the role of emerging technologies such as blockchain and synthetic intelligence in enhancing sustainability initiatives within startups. Despite the increasing recognition of sustainability-oriented innovations, there may be a pressing need for a more comprehensive integration of these technologies to achieve large-scale resource optimization and environmental impact reduction. The examination also reveals a largely unexplored intersection between organizational culture and sustainability-oriented virtual transformation, indicating a valuable area for future research to investigate the ways in which organizational culture influences virtual sustainability practices in startups. Emerging trends suggest a transition towards a multidisciplinary perspective, which prioritizes monetary sustainability, social capital, and environmental stewardship. This trend represents a progression towards a comprehensive understanding of sustainable entrepreneurship, which incorporates virtual transformation and stakeholder engagement to address intricate environmental and market challenges. Imminent research can significantly contribute to sustainable improvement objectives by addressing these gaps and fostering these tendencies, thereby facilitating the growth of modern and resilient startups.

CONCLUSION

This study offers a comprehensive bibliometric and systematic analysis of sustainable entrepreneurship, pointing to the central significance of sustainability practices and digital transformation in enabling startups. The results confirm the proof-of-concept model that sustainability strategies are desirable to restore startup resilience and performance. Based on bibliometric analysis, two core themes demonstrate how adopting digital tools can support sustainable practices and streamline an innovation process

for startups. The study further identifies some of the most critical gaps in the literature on the subject thus far, particularly related to cultural differences and spaces between digitally facilitated work and sustainability initiatives organizationally that should be addressed in future studies. By showing relevance from a conceptual model perspective, this work deepens our understanding of sustainable entrepreneurship and outlines a mechanism to guide future studies on digitalization's role in facilitating new innovative and resilient ventures.

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