Journal of Economic Education and Entrepreneurship Studies
Vol. 7, No. 3, Juni 2026, pp. 233-249
ISSN: 2722-3744 (Print) 2776-0278 (Online)
https://doi.org/10.62794/je3s.v7i3.236

Innovation as a Bridging Mechanism Between Behavioral Theory and Sustainable Entrepreneurship: A Bibliometric Analysis of the Indonesian Research Landscape

Danang Kusnanto*, Suryana, Chairul Furqon, Mokh Adib Sultan
Faculty of Economics and Business Education, Universitas Pendidikan Indonesia, Bandung, 40154, Indonesia

*Corresponding Author
Jl. Dr. Setiabudhi No. 229, Bandung, Jawa Barat, Indonesia 40154
e-mail: danang.kusnanto@upi.edu

Received: February 28, 2026 **Revised:** April 06, 2026; **Accepted**: June 19, 2026

Abstract: This study examines the integration of behavioral theory and sustainable entrepreneurship by positioning innovation as a conceptual connecting mechanism. This topic is important due to the growing demand for global sustainability and the need for a synthesis between psychological determinants and sustainability-oriented entrepreneurial practices. Although behavioral theory, particularly intention-based models, is widely used in entrepreneurship studies, its integration with sustainable entrepreneurship remains fragmented, with a focus on intentions rather than actual behavior. This study offers a new conceptual synthesis by mapping innovation as a structural bridge between behavioral determinants and sustainable entrepreneurship outcomes, an area that has not been systematically explored in the previous literature. The study employed a Scopus-based bibliometric analysis, employing a keyword co-occurrence approach in VOSviewer to identify thematic clusters, network structures, and knowledge convergence patterns. The results revealed four main clusters: behavioral theory, entrepreneurial intention, technology adoption, and sustainable entrepreneurship, with innovation as the main connecting node. The literature is still dominated by intention-based approaches. These findings emphasize the need to develop an integrative model that explains the transformation of behavioral determinants into sustainable entrepreneurship through innovation and provide directions for further empirical research.

Keywords: Behavioral Theory, Sustainable Entrepreneurship, Innovation, Entrepreneurial Intention, Bibliometric Analysis

How to Cite: Kusnanto, D., Suryana, Furqon, C., & Sultan, M. A. (2026). Innovation as a Bridging Mechanism Between Behavioral Theory and Sustainable Entrepreneurship: A Bibliometric Analysis of the Indonesian Research Landscape. *Journal of Economic Education and Entrepreneurship Studies*, *7*(3), 233–249. https://doi.org/10.62794/je3s.v7i3.236

INTRODUCTION

Climate change, environmental degradation, the resource crisis, and increasing pressure on the sustainable development agenda have driven a transformation in the global

entrepreneurial paradigm from a purely profit-oriented orientation to a sustainable entrepreneurial orientation. In this context, entrepreneurship is no longer understood solely as an activity that creates economic value, but also as a strategic mechanism for simultaneously generating social and environmental value (Binder, 2017). The development of the Sustainable Development Goals (SDGs), the circular economy, and the transition to a green economy further strengthen the position of sustainable entrepreneurship as one of the fastest-growing research domains in modern entrepreneurship literature. Sustainable entrepreneurship (SE) is seen as an approach that integrates economic, social, and environmental objectives through the triple bottom line principle, namely the balance between economic profitability, environmental sustainability, and social justice (Elkington, 1997). Therefore, entrepreneurial activity in the context of sustainability has a more complex dimension than conventional entrepreneurship because it is oriented not only toward profit creation but also toward long-term social and ecological impacts (Aghelie et al., 2016; Shahrahmani et al., 2025).

Along with these developments, research on sustainable entrepreneurship has also shown a significant increase in both the number of publications and the broadening of research themes (Pascucci, 2023; Thananusak, 2019). Various studies place innovation as a central element in sustainable entrepreneurship due to its ability to create new solutions to social and environmental challenges (Dean, 2015; Wagner, 2017). From Schaltegger and Wagner's perspective, innovation functions as an integrative tool that enables the simultaneous creation of economic, social, and environmental value (Schaltegger & Wagner, 2011). Thus, innovation is viewed not only as an entrepreneurial output but also as a transformational process that directs entrepreneurial activity toward more sustainable business practices.

On the other hand, studies of entrepreneurial behavior have traditionally been dominated by an intention-based approach, particularly the Theory of Planned Behavior (TPB) developed by Icek Ajzen. TPB explains that entrepreneurial intention is influenced by three main constructs: attitude toward behavior, subjective norms, and perceived behavioral control (Ajzen, 1991). This model has been widely used to explain the formation of entrepreneurial intentions, particularly among university students and in higher education (Liñán & Chen, 2009; Souitaris et al., 2007). Empirical research shows that a positive attitude toward entrepreneurship can increase an individual's intention to start a business because entrepreneurship is seen as a valuable and profitable activity (Mensah et al., 2021; Milohnić & Licul, 2025). Furthermore, entrepreneurship education has been shown to play a role in shaping attitudes, motivation, and perceived benefits toward business activities (Kraiem, 2025).

Subjective norms also play a significant role through social influences from family, friends, and the community, which can strengthen or weaken the social legitimacy of entrepreneurial choices (Mensah et al., 2021; Milohnić & Licul, 2025). Meanwhile, perceived behavioral control (PBC) is often viewed as the most dominant predictor in explaining entrepreneurial intention because it relates to an individual's perception of their abilities, resources, and opportunities to start a business (Ferreira et al., 2025; Mensah et al., 2021). In fact, an explainable artificial intelligence-based approach shows that PBC has the greatest contribution in predicting entrepreneurial intention compared to other TPB components because it is directly related to readiness to act (Ferreira et al., 2025). Overall, the integration of attitudes toward behavior, subjective norms, and perceived behavioral control provides a comprehensive understanding of the formation of entrepreneurial intention through a combination of internal factors and an individual's social context.

Nevertheless, the TPB literature still exhibits fundamental limitations because most research stops at the level of intention and fails to adequately explain the transformation of entrepreneurial intention into actual entrepreneurial behavior, particularly in the context of sustainability. This situation gives rise to what is known as the intention-behavior gap, namely the mismatch between an individual's intention to become an entrepreneur and their actual actions (Baber et al., 2025; Harima et al., 2021). This phenomenon is a crucial issue in entrepreneurship research because not all individuals with strong intentions can translate them into actual behavior. This gap is influenced by various factors such as uncertainty, resource limitations, lack of practical experience, and the tendency to delay action.

This limitation opens up space for the integration of an innovation perspective to

explain the transformation of intention into action. In the dynamic capabilities perspective pioneered by David J. Teece, innovation is viewed as a transformational process that enables organizations and individuals to sense, seize, and reconfigure resources to achieve long-term sustainability (Teece, 2007). Thus, innovation is no longer understood solely as the result of entrepreneurial activity, but rather as an internal mechanism that bridges behavioral determinants with organizational outcomes and actual behavior.

Numerous studies have shown that innovative behavior plays a mediating role in linking entrepreneurial intentions and actions. Innovative behavior enables individuals to transform ideas into action through creativity, opportunity exploration, and problem-solving (Manzi-Puertas et al., 2025). In the context of social entrepreneurship, innovation has even been shown to strengthen the relationship between intention and behavior by encouraging adaptive solutions to social problems (Yimsook, 2025). Furthermore, experiential entrepreneurship education, mentoring, and innovative project development have been shown to accelerate the transformation of intentions into concrete actions (Duennebeil et al., 2025; Tran et al., 2024). The TPB-based approach also shows that entrepreneurship education integrated with innovation can strengthen attitudes toward behavior, subjective norms, and perceived behavioral control, thus encouraging actual entrepreneurial behavior (Ma et al., 2020). Furthermore, entrepreneurial self-efficacy and job satisfaction also contribute to the emergence of innovative behavior, ultimately bridging entrepreneurial intention and behavior (Feng et al., 2025; J. Lee et al., 2019).

In addition to innovation at the individual level, the transformation of intentions into entrepreneurial behavior is also influenced by the existence of a supportive innovation ecosystem. In this context, the Triple Helix model developed by Henry Etzkowitz and Chunyan Zhou emphasizes the importance of collaboration between universities, industry, and government in fostering knowledge transfer, knowledge spillovers, and sustainable innovation (Etzkowitz & Zhou, 2017; Liu et al., 2026). This ecosystem plays a role in providing access to resources, networks, institutional support, and an innovative environment that enables the realization of ideas into real businesses (Dsilva et al., 2025; Zhang et al., 2025). However, although conceptual literature demonstrates the importance of innovation and ecosystems in bridging the intention-behavior gap, studies integrating behavioral theory, innovation, and sustainable entrepreneurship remain fragmented.

Furthermore, research on sustainable entrepreneurship also exhibits geographical and conceptual disparities. Most studies still focus on developed countries, thus expanding research to developing countries is needed to gain a more contextual understanding of the institutional, cultural, and economic variations that influence the success of sustainable entrepreneurship (Thananusak, 2019; Wagner, 2017). Furthermore, behavioral aspects such as individual intentions, motivations, and decision-making in running a sustainable business are still relatively limited compared to studies on business outcomes and innovation (Marcon et al., 2026; Pascucci, 2023; Tounés et al., 2015). This condition indicates a research gap in the lack of systematic integration of behavioral, innovation, and sustainable entrepreneurship theories into a unified knowledge architecture.

Based on this gap, this study offers a scientific update through a conceptual synthesis that positions innovation as a connecting mechanism between behavioral theory and sustainable entrepreneurship. This research seeks to integrate two domains that have previously developed relatively separately: behavioral theory, which focuses on the formation of intentions, and sustainable entrepreneurship, which focuses on the creation of sustainable value. Thus, innovation is positioned as a structural mechanism explaining how behavioral determinants can be transformed into actual sustainable entrepreneurial behavior.

To achieve this objective, this study uses a bibliometric approach based on keyword co-occurrence network analysis from Scopus-indexed publications. This approach was chosen because it can systematically and objectively map the structure of knowledge, the dynamics of literature development, the interconnections between concepts, and the evolution of research themes. Through this bibliometric approach, this study is expected to identify key thematic clusters, the position of innovation within the knowledge structure, and the direction of future research agenda development.

Theoretically, this research contributes to the development of an integrative model capable of explaining the transformation of entrepreneurial intention into sustainable entrepreneurial behavior through innovation. Practically, this research also has implications for the development of entrepreneurship education, innovation policy, and the strengthening of a sustainable entrepreneurial ecosystem that can accelerate the realization of ideas into concrete actions. Therefore, this research is directed to answer the following research questions:

1. How is the distribution and development of the literature related to behavioral theory, innovation, and sustainable entrepreneurship?
2. What thematic clusters and knowledge structures have emerged within these domains?
3. How is innovation positioned as a connecting mechanism between behavioral theory and sustainable entrepreneurship?
4. What are the research gaps and directions for future research agendas?

After this introductory section, the paper is structured systematically by continuing with the research methodology section, the results of the bibliometric mapping, which discuss the findings of the analysis and future research agendas, and the conclusion section, which summarizes the theoretical contributions and implications of the research.

METHOD

To understand how the relationship between behavioral theory, innovation, and sustainable entrepreneurship develops in academic literature, this study uses a bibliometric analysis approach based on Scopus data. Bibliometric analysis allows researchers to map the knowledge structure of a field through the analysis of keyword networks, citations, and research collaborations. This research's analytical framework adopts the four-stage bibliometric analysis procedure proposed by Donthu et al. (2021), shown in Figure 1: defining the purpose and scope of the bibliometric study, selecting techniques for the bibliometric analysis, collecting data for the bibliometric analysis, conducting the bibliometric analysis, and reporting the results.

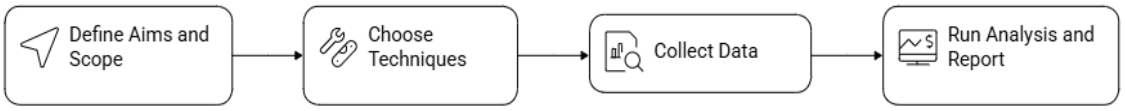

Figure 1. The Bibliometric Analysis Procedure
Source: Donthu et al. (2021)

Define Aims and Scope

The first stage is determining the purpose and scope of the bibliometric study. At this stage, the research establishes a conceptual focus on the study of behavioral theory, sustainable entrepreneurship, and innovation. The primary objectives are to map the conceptual structure, identify thematic clusters, and identify research gaps in the integration of these three domains.

Choose Techniques

The second stage is selecting an appropriate bibliometric analysis technique. This study uses keyword co-occurrence analysis to identify conceptual relationships between topics. This technique was chosen because it is able to reveal the intellectual structure and patterns of relationships between concepts in the literature. To support the mapping process, VOSviewer software is used, which allows for systematic visualization of research networks through network models, overlays, and density visualizations. Network visualization is used to identify the strength of relationships between items based on keyword co-occurrence; Overlay visualization is used to illustrate the development of topics over time; and Density visualization is used to show the density of topic occurrences in the literature.

Collect Data

The third stage is data collection for bibliometric analysis. Articles were obtained from Elsevier's Scopus database, which has a wide international journal coverage and standardized metadata. The search process was carried out using a combination of keywords (search strings) relevant to the research focus. The search strings used included (TITLE-ABS-KEY(sustainable AND entrepreneurship) OR TITLE-ABS-KEY(sustainable AND innovative AND behavior) OR

TITLE-ABS-KEY(innovation AND intention) OR TITLE-ABS-KEY(theory AND of AND planned AND behavior) OR TITLE-ABS-KEY(triple AND helix AND ecosystem)) AND PUBYEAR > 2004 AND PUBYEAR < 2026 AND LIMIT-TO(SUBJAREA, "BUSI") AND LIMIT-TO(DOCTYPE, "ar") AND LIMIT-TO(LANGUAGE, "English")). This string represents a search query in the Scopus scientific database used to find articles relevant to the topics of sustainable entrepreneurship, sustainable innovative behavior, innovation intention, the theory of planned behavior, and the triple helix ecosystem. The search was conducted using titles, abstracts, and keywords.

As shown in Table 1, which displays the research protocol used in this study, the search results were limited to English-language journal articles in the fields of business, management, and accounting published between 2005 and 2025, resulting in 10,184 articles. Overall, this query was designed to gather literature focused on the integration of aspects of sustainable behavior, innovation, and entrepreneurship in a business context. Data meeting the inclusion criteria were then downloaded in Research Information System (RIS) format to ensure compatibility with the analysis software.

Table 1. Research Protocol

Type	Criteria
Research database	Scopus
Search fields	Title, abstract, and keywords
Search string	(TITLE-ABS-KEY (sustainable AND entrepreneurship) OR TITLE-ABS-KEY(sustainable AND innovative AND behavior) OR TITLE-ABS-KEY(innovation AND intention) OR TITLE-ABS-KEY(theory AND of AND planned AND behavior) OR TITLE-ABS-KEY(triple AND helix AND ecosystem))
Date range	2005–2025
Subject area	Business, management and accounting
Document type	Article
Publication type	Peer-reviewed journals
Language	English
Search date	March 7, 2026

Source: Scopus (2026)

Run Analysis and Report

The fourth stage is conducting a bibliometric analysis and compiling a report. At this stage, relationships between keywords are mapped using VOSviewer to generate a graphical representation of the research network. The analysis focuses on identifying key thematic clusters, measuring total link strength, and evaluating the central position of innovations within the network linking behavioral theory and sustainable entrepreneurship. The mapping results are then interpreted in depth to explain patterns of literature convergence and identify remaining research gaps.

RESULTS AND DISCUSSION

Annual Trends in Research on Innovation, Behavioral Theory, and Sustainable Entrepreneurship (2005–2025)

The results of the Scopus database search for the period 2005–2025 found a total of 10,182 publications with a combination of keywords sustainable entrepreneurship, sustainable innovative behavior, innovation intention, theory of planned behavior, and triple helix ecosystem. Over the past two decades, the total publications showed a consistent increasing trend every year (Figure 2). In the initial phase, the number of publications was still relatively limited and stable, then there was a gradual increase until a significant surge began to be seen in the period 2019–2020, where the number of publications increased from 584 documents in 2019 to 712 documents in 2020. This increase continued progressively in the following years, namely 773 documents (2021), 919 documents (2022), 1,047 documents (2023), 1,431 documents (2024), and reached 1,984 documents in 2025 as the highest number during the observation period. The post-2020 acceleration demonstrates growing academic attention to the integration of innovation and sustainability within a behavioral theory framework,

particularly in the context of global uncertainty and the transformation of sustainable business models. This exponential growth also suggests an expansion of subtopics and multidisciplinary approaches.

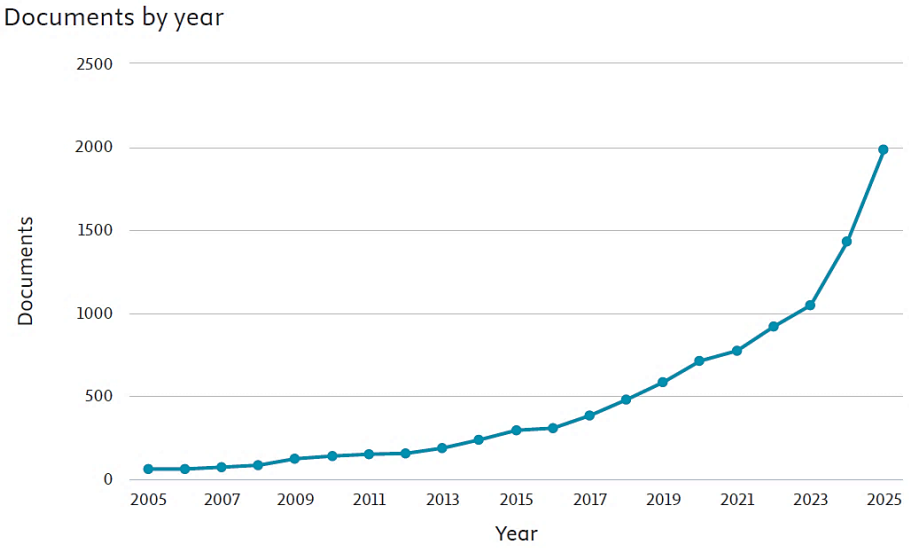

Figure 2. Annual Trends Document on Innovation, Behavioral Theory, and Sustainable Entrepreneurship
Source: Scopus (2026)

Most Influential Authors and Publications on Innovation, Behavioral Theory, and Sustainable Entrepreneurship (2005–2025)

Still based on the Scopus database, information was also obtained on the 10 authors with the highest number of documents related to sustainable entrepreneurship, sustainable innovative behavior, innovation intention, the theory of planned behavior, and the triple helix ecosystem from 2005 to 2025. Figure 3 shows the number of publications by author, with Han, H., ranking first with 43 documents, far surpassing all other authors. Second place went to Duong, C.D., with 22 documents, followed by Kraus, S., with 18 documents, and Dang, L.P., Goh, E., and Ramayah, T., each with 17 documents. Meanwhile, Kim, J.J., Lee, C.K., and Ratten, V. each recorded 16 documents, and Singh, G., followed with 14 documents.

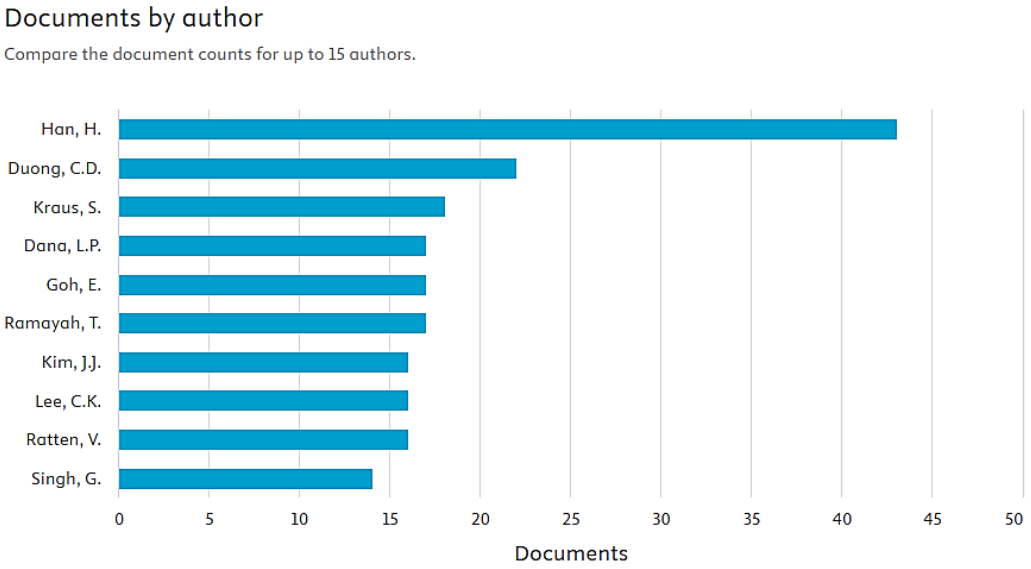

Figure 3. Distribution Data of Number of Publications by Author on Innovation, Behavioral Theory, and Sustainable Entrepreneurship
Source: Scopus (2026)

Furthermore, an analysis of the ten most-cited articles in Table 2, including the most

cited authors, documents, and journals related to innovation, behavioral theory, and sustainable entrepreneurship during the period 2005–2025, can be mapped into several interrelated key themes: dynamic capabilities and innovation, intention-based behavioral theory (Theory of Planned Behavior), technology adoption, and sustainable entrepreneurship and environmentally friendly behavior. Research indicates that dynamic capabilities are a critical foundation for sustainable company performance through an organization's ability to sense opportunities (sensing), seize opportunities (seizing), and reconfigure resources (reconfiguring), enabling companies to maintain a competitive advantage in a dynamic business environment (Teece, 2007). Furthermore, an entrepreneurial intention measurement instrument based on the Theory of Planned Behavior (TPB) has been developed and proven to have good validity across various cultural contexts, indicating that attitudes, subjective norms, and perceived behavioral control are important determinants in the formation of entrepreneurial intentions (Liñán & Chen, 2009).

The next theme relates to the application of behavioral theory in the context of technology adoption and consumer behavior. The extended TPB model demonstrates a strong ability to explain consumer behavior in e-commerce adoption, with factors such as trust, perceived usefulness of technology, and digital system characteristics being important determinants in shaping technology adoption intentions (Pavlou & Fygenson, 2006). Other research also shows that mobile commerce acceptance is influenced by technology compatibility, perceived risk, and usage costs within the framework of the Technology Acceptance Model (TAM) (Wu & Wang, 2005). The integration of TAM and TPB also shows that perceived security benefits and risks play a significant role in shaping internet banking usage intentions (M.-C. Lee, 2009). Furthermore, employee compliance with organizational information security policies is influenced by attitudes, social norms, and self-efficacy, confirming the importance of individual behavioral factors in implementing technology security policies (Bulgurcu et al., 2010).

In the context of sustainability, research shows that expanding the TPB by including environmental concern variables can improve the model's ability to predict consumer intentions to purchase environmentally friendly products (Paul et al., 2016). Entrepreneurship education has also been shown to increase students' entrepreneurial intentions, particularly through learning and inspiration processes that influence attitudes toward entrepreneurship (Souitaris et al., 2007). On the other hand, a conceptual framework linking sustainable entrepreneurship with sustainable innovation suggests that companies can create both economic value and social and environmental value through sustainability-oriented innovation (Schaltegger & Wagner, 2011). Furthermore, the TPB model is also able to explain consumers' intentions to choose environmentally friendly hotels, where attitudes, subjective norms, and perceived behavioral control significantly influence consumers' decisions to choose more environmentally friendly services (Han et al., 2010). Overall, these findings indicate that the literature is moving toward integrating behavioral, innovation, and sustainability theories as a conceptual foundation for the development of sustainable entrepreneurship studies.

Table 2. Article and Author Data in Scientific Journals with the Most Citations on the Topics of Innovation, Behavioral Theory, and Sustainable Entrepreneurship for the Period 2005–2025

Title	Author	Year	Journal	Total Citations
Explicating dynamic capabilities: The nature and microfoundations of (sustainable) enterprise performance	Teece, D.J.	2007	Strategic Management Journal	10,686
Development and cross-cultural application of a specific instrument to measure entrepreneurial intentions	Liñán, F., Chen, Y.-W.	2009	Entrepreneurship Theory and Practice	2,810
Understanding and predicting electronic commerce adoption: An extension of the theory of planned	Pavlou, P.A., Fygenson, M.	2006	MIS Quarterly Management Information	2,205

Title	Author	Year	Journal	Total Citations
behavior			Systems	
What drives mobile commerce? An empirical evaluation of the revised technology acceptance model	Wu, J.-H., Wang, S.-C.	2005	Information and Management	1,860
Predicting green product consumption using theory of planned behavior and reasoned action	Paul, J., Modi, A., Patel, J.	2016	Journal of Retailing and Consumer Services	1,757
Do entrepreneurship programmes raise entrepreneurial intention of science and engineering students? The effect of learning, inspiration and resources	Souitaris, V., Zerbinati, S., Al-Laham, A.	2007	Journal of Business Venturing	1,704
Information security policy compliance: An empirical study of rationality-based beliefs and information security awareness	Bulgurcu, B., Cavusoglu, H., Benbasat, I.	2010	MIS Quarterly Management Information Systems	1,616
Factors influencing the adoption of internet banking: An integration of TAM and TPB with perceived risk and perceived benefit	Lee, M.-C.	2009	Electronic Commerce Research and Applications	1,514
Sustainable entrepreneurship and sustainability innovation: Categories and interactions	Schaltegger, S., Wagner, M.	2011	Business Strategy and the Environment	1,508
Application of the Theory of Planned Behavior to green hotel choice: Testing the effect of environmental friendly activities	Han, H., Hsu, L.-T.(J.), Sheu, C.	2010	Tourism Management	1,506

Source: Scopus (2026)

Trends in Document Distribution by Country on Innovation, Behavioral Theory, and Sustainable Entrepreneurship (2005–2025)

Publication production in the domains of innovation, behavioral theory, and sustainable entrepreneurship, based on a search of the Scopus database, shows the United States dominating with 1,420 documents, followed by India with 1,123 documents, China with 1,018 documents, and the United Kingdom with 838 documents (Figure 4). Malaysia, with 809 documents, and Australia, with 542 documents, also make significant contributions. Interestingly, Indonesia ranks seventh with 519 documents, surpassing several European countries such as Germany with 470 documents and Spain with 458 documents. This position indicates that Indonesia has relatively strong academic participation globally in sustainable entrepreneurship and behavior-based innovation.

Indonesia's ranking in seventh place is an important finding in the context of developing countries. Empirically, developing countries face structural challenges such as limited access to innovation financing, low technological capacity, disparities in the quality of education, particularly in entrepreneurship, and pressures related to environmental and social issues. The high number of publications from Indonesia indicates that the academic community is responding to these complexities by strengthening theoretical and empirical studies. However, the magnitude of publication contributions does not necessarily align with the maturity of the innovation and sustainability ecosystem at the practical level. Thus, Indonesia's position on the global map reflects the urgent need to bridge research findings with more effective implementation of sustainable entrepreneurship policies and practices in developing countries.

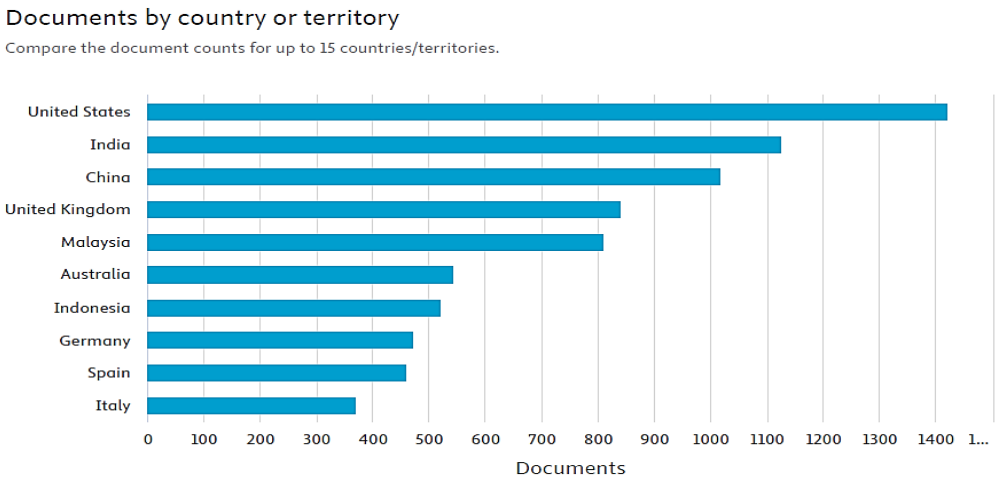

Figure 4. Country-Based Trends in Document Distribution on Innovation, Behavioral Theory, and Sustainable Entrepreneurship
Source: Scopus (2026)

Development of Research Focus on Innovation, Behavioral Theory, and Sustainable Entrepreneurship (2005–2025)

To understand publication mapping based on keyword networks or relationships, the development of the literature over time, and the visualization of keyword-based density, a bibliometric analysis was conducted using VOSviewer software. The first mapping result is the network visualization (Figure 5) below.

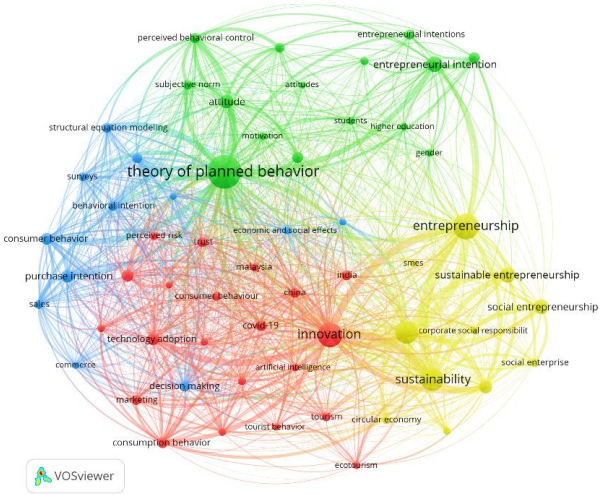

Figure 5. Network Visualization
Source: VOS Viewer (2026)

The mapping results from the network visualization show that the research landscape is fragmented into four main epistemic clusters. This fragmentation indicates that the integration between behavioral theory and sustainable entrepreneurship has not been fully consolidated, as shown in Table 3.

Table 3. Color Cluster Based on Network Visualization

Cluster	Keywords	Colour
Cluster 1 (21 items)	Artificial intelligence, China, consumer behaviour, consumption behavior, COVID-19, ecotourism, electronic commerce, India, Innovation, Malaysia, marketing, perceived risk, perception, social media, TAM, technology acceptance, technology adoption, theoretical study, tourism, tourist behavior, trust	Red
Cluster 2 (15 items)	Attitude, attitudes, entrepreneurial intention, entrepreneurial intentions, entrepreneurship education, gender, higher education, intention, motivation, perceived behavioral control, self-efficacy, students, subjective norm, subjective norms, theory of planned behavior	Green
Cluster 3	Behavioral intention, behavioral research, commerce, consumer behavior,	Blue

Cluster	Keywords	Colour
(12items)	decision making, economic and social effects, economics, purchase intention, regression analysis, sales, structural equation modeling, surveys	
Cluster 4 (11 items)	Circular economy, corporate social responsibility, entrepreneur, entrepreneurship, SMEs, social enterprise, social entrepreneurship, sustainability, sustainable development, sustainable development goals, sustainable entrepreneurship	Yellow

Source: VOS Viewer (2026)

The network visualization results show that the mapped research fields are divided into four main clusters, representing the direction of conceptual research development. Cluster 1 (red) emphasizes the dominance of digital transformation and the use of technology in shaping consumer behavior and modern market interaction patterns, thus demonstrating that technology adoption is a key concern in contemporary economic dynamics. Cluster 2 (green) reflects the strength of psychological and educational approaches in explaining the formation of entrepreneurial intentions, indicating that entrepreneurial development is increasingly viewed as a result of individual learning processes, motivation, and behavioral construction. Cluster 3 (blue) illustrates a research trend oriented toward strengthening empirical approaches and behavioral analysis in economic decision-making, thus emphasizing the importance of quantitative methods in validating relationships between behavioral variables. Meanwhile, Cluster 4 (yellow) demonstrates the development of an entrepreneurial paradigm that is no longer solely oriented toward economic profit but also toward social and environmental sustainability, indicating increasing academic attention to integrating entrepreneurship with the sustainable development agenda. Overall, this network visualization mapping demonstrates a shift in the research landscape from a traditional focus on behavior and technology to a more holistic approach that incorporates aspects of sustainability and social responsibility within the modern entrepreneurial ecosystem.

The second mapping result, the overlay visualization, demonstrates significant temporal evolution. Early literature (blue-green) focused on the TPB and consumer behavior. Meanwhile, recent publications (yellow) show a sharp increase in the topics of sustainable entrepreneurship, sustainability, and innovation. These findings indicate a paradigm shift: from an individual psychological approach to an integration of sustainability dimensions. However, this shift has not been accompanied by a robust theoretical reconstruction, as the sustainability node still relies on the established TPB structure. Thus, the overlay visualization (Figure 6) empirically confirms that the literature has experienced topic expansion but has not yet reached theoretical consolidation.

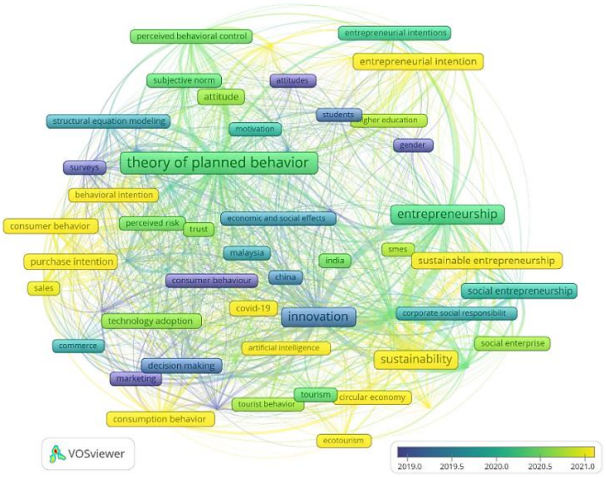

Figure 6. Overlay Visualization
Source: VOS Viewer (2026)

Meanwhile, the third mapping result, Density Visualization, shows the highest concentration in the areas of theory of planned behavior, entrepreneurship, innovation, and sustainability. However, the transition zone between the SDGs and sustainable entrepreneurship shows medium to low density. This condition indicates a structural gap: although both domains are developing rapidly, direct conceptual integration between psychological determinants and sustainable entrepreneurship practices is still limited. The innovation node, meanwhile, emerges as an area with high density and a connecting position, indicating that innovation has the potential to be a mediating mechanism bridging sustainability intentions and practices (Figure 7).

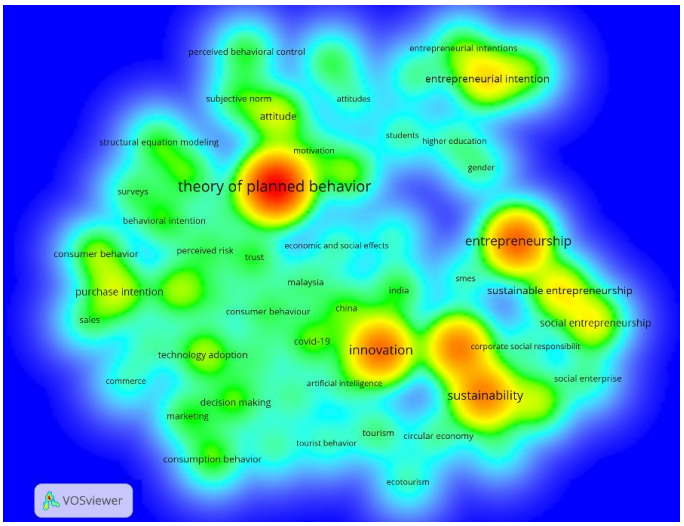

Figure 7. Density Visualization
Source: VOS Viewer (2026)

Development of Research Focus on Innovation, Behavioral Theory, and Sustainable Entrepreneurship in Indonesia (2015–2025)

By adding the "Indonesia" criterion to the Scopus database keywords, 52 articles were obtained. Network visualization of these articles did not find the keyword "sustainable entrepreneurship." This indicates a conceptual disconnect in the Indonesian literature. Although research in Indonesia has extensively discussed sustainability, entrepreneurship, and approaches based on the Theory of Planned Behavior and the Technology Acceptance Model, combining the two within a theoretical framework for sustainable entrepreneurship has not been explicitly formulated.

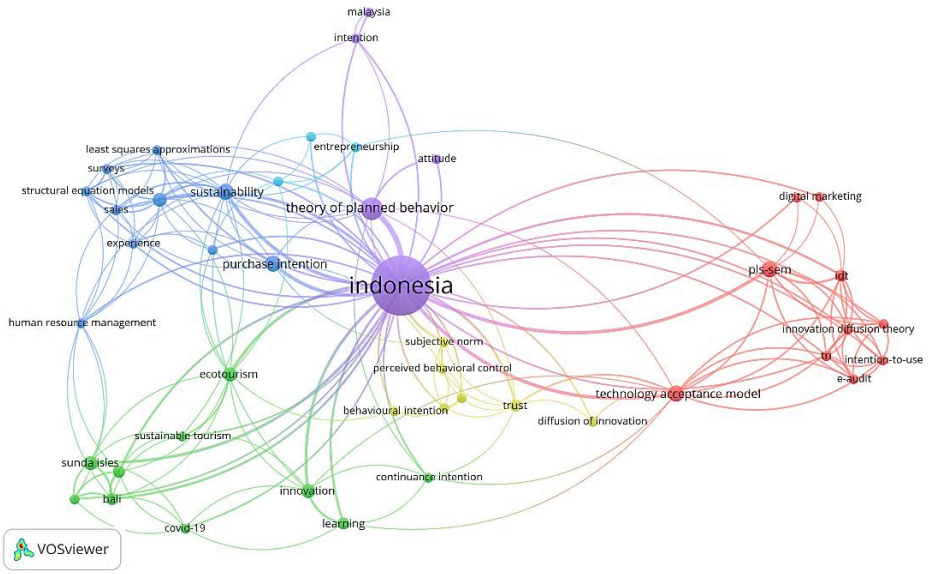

Figure 8. Network Visualization in the Indonesian Context
Source: VOS Viewer (2026)

The conditions in this network visualization (Figure 8) indicate that academic discussions still position entrepreneurship and sustainability as separate fields of study, rather than as an integrated approach oriented toward business model transformation. Empirically, this may reflect the characteristics of developing countries, which still focus more on aspects of innovation intention and adoption than on strategic shifts toward sustainable entrepreneurship. Thus, the absence of such a term actually highlights a significant theoretical gap and opens up space for the development of an integrative model that positions innovation as a connecting mechanism between behavioral determinants and sustainable entrepreneurial practices in the Indonesian context.

Discussion

From a Research Gap to an Integrative Conceptual Model

This study shows that studies on innovation, behavioral theory, and sustainable entrepreneurship have experienced significant growth over the past two decades. This increase in publications reflects growing academic attention to the importance of integrating individual behavioral determinants with sustainability-oriented entrepreneurial transformations in response to global social, economic, and environmental challenges. These findings align with the growing literature that positions innovation and sustainability as strategic agendas in modern entrepreneurship development (Dean, 2015; Pascucci, 2023; Wagner, 2017). However, despite the increasing publication volume, this study's findings indicate that the conceptual integration between behavioral theory, innovation, and sustainable entrepreneurship remains relatively fragmented. This situation reinforces the argument that sustainable entrepreneurship research still faces a research gap, both theoretically and methodologically (Aghelie et al., 2016; Marcon et al., 2026).

Bibliometric findings indicate that the Theory of Planned Behavior (TPB) remains the dominant theoretical foundation for explaining entrepreneurial intentions. The dominance of the TPB in various entrepreneurship studies indicates that attitudes, subjective norms, and perceived behavioral control are viewed as the primary determinants of behavioral intention formation **(Ajzen, 1991; Liñán & Chen, 2009; Mensah et al., 2021)**. In the context of innovation, these three determinants have also been shown to influence individuals' intentions to engage in innovative activities (Ferreira et al., 2025; Ma et al., 2020). However, these research findings indicate that most studies stop at the level of intention and fail to adequately explain how this intention is transformed into actual, sustainability-oriented entrepreneurial behavior. As a result, sustainable entrepreneurship research still tends to use a linear and static behavioral approach, where intention is positioned as the result of theoretical explanation. This situation reinforces the intention-behavior gap, which has long been a major weakness in entrepreneurship research (Baber et al., 2025; Harima et al., 2021; Tran et al., 2024).

Based on this bibliometric interpretation, this study offers a conceptual contribution by positioning innovation as a bridging mechanism linking behavioral determinants with sustainable entrepreneurship. As shown in Figure 9, the proposed model integrates three key constructs of the TPB (attitude toward behavior, subjective norms, and perceived behavioral control) as determinants of innovation intention formation. Furthermore, innovation intention influences innovative behavior, which then contributes to the formation of sustainable entrepreneurship. This model demonstrates that sustainable entrepreneurship is not formed directly from intention, but rather through a process of transforming innovative behavior that translates intention into concrete actions.

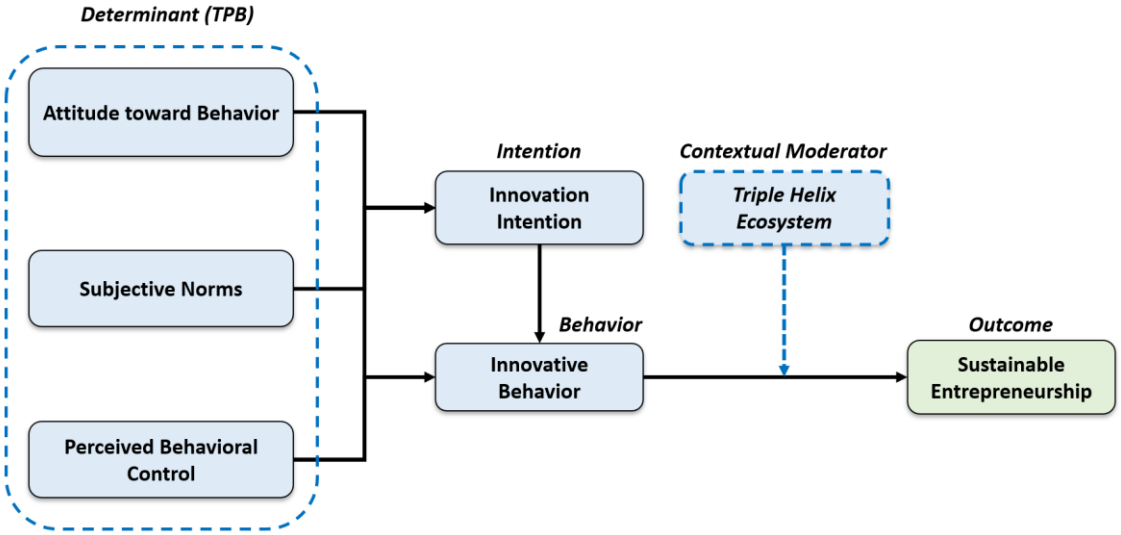

Figure 9. Proposed Integrative Conceptual Model
Source: Author et al. (2026)

The Role of Innovation as a Bridging Mechanism Between Planned Behavior and Sustainable Entrepreneurship

This research expands the conventional TPB framework, which generally only explains the relationship between behavioral determinants and intentions. In the proposed model, innovative behavior is positioned as a transformational pathway that bridges the relationship between intentions and sustainability-oriented entrepreneurial actions. This perspective aligns with the view of Schaltegger & Wagner (2011), who emphasize that sustainability innovation is a key mechanism for simultaneously creating economic, social, and environmental value. Furthermore, Teece (2007) asserts that innovation and dynamic capabilities are essential foundations for transforming resources and opportunities into sustainable organizational excellence. Therefore, innovation in this study is positioned not merely as an entrepreneurial output but as a behavioral process and strategic capability that enables the transformation of intentions into sustainable entrepreneurial practices.

The central role of innovative behavior in this model also strengthens the argument that the success of sustainable entrepreneurship cannot be explained solely through the formation of entrepreneurial intentions. Research by Feng et al. (2025) suggests that entrepreneurial self-efficacy needs to be translated into concrete actions through a process of behavioral transformation, while Manzi-Puertas et al. (2025) assert that innovative behavior plays a crucial mediating role in encouraging entrepreneurial action under resource constraints. Thus, the results of this study provide a theoretical contribution by showing that innovation serves as a connecting mechanism that explains how psychological determinants can be transformed into sustainability-oriented entrepreneurial practices.

The Role of Triple Helix Ecosystem as a Contextual Moderator Between innovative behavior and sustainable entrepreneurship

In addition to emphasizing the behavioral dimension, the model in Figure 9 demonstrates the importance of contextual factors by including the Triple Helix Ecosystem as a contextual moderator. This position suggests that the relationship between innovative behavior and sustainable entrepreneurship is influenced by the quality of the innovation ecosystem, which involves collaboration between universities, industry, and government. Previous literature indicates that the Triple Helix model plays a crucial role in creating an innovation environment through access to resources, collaborative networks, institutional support, and knowledge spillovers (Dsilva et al., 2025; Etzkowitz & Zhou, 2017; Liu et al., 2026). However, the network visualization results in this study indicate that the Triple Helix concept has not yet emerged as a dominant theme in the bibliometric structure. This finding indicates that research on sustainable entrepreneurship still focuses more on individual factors than on innovation ecosystem-based approaches.

This situation suggests that current sustainable entrepreneurship literature is still limited in explaining how collaborative environments shape sustainable innovative behavior. Therefore, this study identifies theoretical opportunities to integrate the innovation ecosystem perspective into future sustainable entrepreneurship models. In this context, the Triple Helix Ecosystem is positioned as a reinforcing variable that magnifies the influence of innovative behavior on sustainable entrepreneurship. This perspective aligns with research by Zhang et al. (2025), which shows that innovative behavior is influenced by interactions between factors, system openness, and institutional support within the innovation ecosystem. Thus, the success of sustainable entrepreneurship depends not only on individual behavioral determinants but also on the quality of the innovation system that supports the entrepreneurial transformation process.

Implications, Limitations, and Future Research Directions

This research has important implications for theory, education, and policy in the field of sustainable entrepreneurship. Theoretically, this research contributes by developing an integrative conceptual model that links behavioral determinants, innovative behavior, and sustainable entrepreneurship through an innovation-based transformational process. The research findings confirm that entrepreneurial intention alone is insufficient to explain sustainable entrepreneurship outcomes if it is not translated into innovative behavior and supported by a collaborative innovation ecosystem. In the context of entrepreneurship education, the results of this study demonstrate the importance of developing a learning system that focuses not only on forming entrepreneurial intention but also on strengthening innovation capabilities, innovative behavior, sustainability orientation, and experiential learning processes. This perspective is supported by previous research showing that entrepreneurship education can facilitate the transition from intention to actual entrepreneurial action through the development of innovation-based competencies (Duennebeil et al., 2025; Kraiem, 2025; Souitaris et al., 2007). From a policy perspective, the government and higher education institutions need to strengthen the Triple Helix-based collaborative innovation ecosystem to support sustainability-oriented entrepreneurship through institutional support, collaborative networks, and innovation-based policies.

This research has several limitations that should be noted. First, this study uses a bibliometric approach that focuses on publication trends, keyword structure, and conceptual relationships in the literature. Therefore, the proposed conceptual model has not been empirically tested. Second, the research analysis relies primarily on the Scopus database, thus likely not fully representing research indexed in other international or regional databases. Third, although this study identifies the importance of innovation ecosystems, the role of the Triple Helix Ecosystem is still discussed conceptually and is not supported by empirical evidence regarding the dynamics of collaboration between universities, industry, and government. Furthermore, the results show that the concept of sustainable entrepreneurship is still not widely used explicitly in entrepreneurship research or practice in Indonesia, indicating that entrepreneurship and sustainability are often positioned as separate domains. This condition reflects broader structural challenges in developing countries, where sustainability is often viewed as an external responsibility of businesses and has not yet become a primary orientation in entrepreneurial activity.

Further research is recommended to empirically test the proposed integrative conceptual model, particularly regarding the mediating role of innovative behavior and the moderating role of the Triple Helix Ecosystem in explaining sustainable entrepreneurship. Quantitative approaches such as SEM or PLS-SEM can be used to examine the causal relationships between behavioral determinants, innovation intentions, innovative behavior, and sustainable entrepreneurship outcomes. Future research should also explore how collaborative innovation ecosystems influence the transformation from entrepreneurial intentions to sustainability-oriented entrepreneurial actions, particularly in developing countries like Indonesia. Furthermore, longitudinal and mixed methods approaches are recommended to capture the dynamic process of how behavioral intentions evolve into sustainable entrepreneurial practices over time. Expanding the analysis to other databases and integrating interdisciplinary perspectives can also strengthen the theoretical maturity and contextual relevance of future sustainable entrepreneurship research.

CONCLUSIONS

This study concludes that the relationship between behavioral theory, innovation, and sustainable entrepreneurship remains under-integrated in the existing literature. The dominance of intention-based approaches suggests that previous research tends to focus on intention formation and fails to explain the transformation process toward sustainability-oriented entrepreneurial practices.

The primary contribution of this study lies in the development of an integrative conceptual model that positions innovative behavior as a connecting mechanism between behavioral determinants in the Theory of Planned Behavior and sustainable entrepreneurship. Furthermore, this study emphasizes the importance of the Triple Helix Ecosystem as a contextual factor that strengthens the transformation of innovative behavior into sustainable entrepreneurial practices. Thus, this study provides a conceptual foundation for the development of a more dynamic, integrative, and ecosystem-based model of sustainable entrepreneurship, particularly in the context of developing countries like Indonesia..

REFERENCES

Aghelie, A., Sorooshian, S., & Azizan, N. A. (2016). Research gap in sustainopreneurship. *Indian Journal of Science and Technology*, *9*(12). https://doi.org/10.17485/ijst/2016/v9i12/77648

Ajzen, I. (1991). The theory of planned behavior. *Organizational Behavior and Human Decision Processes*, *50*(2), 179–211. https://doi.org/10.1016/0749-5978(91)90020-T

Baber, H., Bhardwaj, S., & Chopra, R. (2025). Entrepreneurial Intentions and Actual Behavior. In *International Encyclopedia of Business Management* (p. Vol1:521-Vol1:527). Elsevier. https://doi.org/10.1016/B978-0-443-13701-3.00193-6

Binder, J. K. (2017). *THEORIZING ABOUT SUSTAINABLE ENTREPRENEURSHIP* [Technische Universität München]. https://mediatum.ub.tum.de/doc/1340447/1340447.pdf

Bulgurcu, B., Cavusoglu, H., & Benbasat, I. (2010). Information Security Policy Compliance: An Empirical Study of Rationality-Based Beliefs and Information Security Awareness1. *Management Information Systems Quarterly*, *34*(3), 523–548. https://doi.org/10.2307/25750690

Dean, T. J. (2015). Sustainability and Entrepreneurship. In *Wiley Encyclopedia of Management* (pp. 1–3). wiley. https://doi.org/10.1002/9781118785317.weom030093

Donthu, N., Kumar, S., Mukherjee, D., Pandey, N., & Lim, W. M. (2021). How to conduct a bibliometric analysis: An overview and guidelines. *Journal of Business Research*, *133*, 285–296. https://doi.org/10.1016/j.jbusres.2021.04.070

Dsilva, J., Usmani, F. Z. A., & Shaikh, M. I. (2025). Assessing the impact of innovation ecosystems and collaborative networks on sustainable entrepreneurship in developing economies. In *Innovation Ecosystems and Sustainable Technologies: Enhancing Competitiveness and Sustainability* (pp. 31–50). Emerald Publishing. https://doi.org/10.1108/978-1-83662-368-720251002

Duennebeil, S., Wach, B., Maisch, B., & Boettcher, A. (2025). Enhancing Entrepreneurial Activity through Advanced Entrepreneurship Courses. *International Conference on Higher Education Advances*, 634–642. https://doi.org/10.4995/HEAd25.2025.20023

Elkington, J. (1997). *Cannibals With Forks: The Triple Bottom Line of 21st Century Business* (1st ed.). Capstone Publishing Limited. http://www.elecbook.com/

Etzkowitz, H., & Zhou, C. (2017). The triple helix: University-industry-government innovation and entrepreneurship. In *The Triple Helix: University-Industry-Government Innovation and Entrepreneurship*. Taylor and Francis. https://doi.org/10.4324/9781315620183

Feng, L., Leong, S., Cheah, K. S. L., & Deng, J. (2025). Converting Students' Entrepreneurial Self-Efficacy into Tangible Entrepreneurial Actions*. *International Journal of Engineering Education*, *41*(6), 1605–1615. https://www.scopus.com/inward/record.uri?eid=2-s2.0-105022115784&partnerID=40&md5=8671f6cbf3a40649b09b2b0226a766e0

Ferreira, J., Fernandes, C., & Veiga, P. M. (2025). Explainable artificial intelligence for predicting entrepreneurial intentions: a theory of planned behavior approach. *International Journal of Entrepreneurial Behaviour and Research*, 1–27. https://doi.org/10.1108/IJEBR-05-2025-

0660

Han, H., Hsu, L. T. (Jane), & Sheu, C. (2010). Application of the Theory of Planned Behavior to green hotel choice: Testing the effect of environmental friendly activities. *Tourism Management*, *31*(3), 325–334. https://doi.org/10.1016/j.tourman.2009.03.013

Harima, A., Gießelmann, J., Göttsch, V., & Schlichting, L. (2021). Entrepreneurship? Let us do it later: procrastination in the intention–behavior gap of student entrepreneurship. *International Journal of Entrepreneurial Behaviour and Research*, *27*(5), 1189–1213. https://doi.org/10.1108/IJEBR-09-2020-0665

Kraiem, A. (2025). The Effect of Entrepreneurship Education on the Entrepreneurial Intention of Tunisian Students: A Comparative Study. *International Journal of Interdisciplinary Organizational Studies*, *20*(2), 105–139. https://doi.org/10.18848/2324-7649/CGP/v20i02/105-139

Lee, J., Kim, D., & Sung, S. (2019). The eect of entrepreneurship on start-up open innovation: Innovative behavior of university students. *Journal of Open Innovation: Technology, Market, and Complexity*, *5*(4). https://doi.org/10.3390/joitmc5040103

Lee, M.-C. (2009). Factors influencing the adoption of internet banking: An integration of TAM and TPB with perceived risk and perceived benefit. *Electronic Commerce Research and Applications*, *8*(3), 130–141. https://doi.org/https://doi.org/10.1016/j.elerap.2008.11.006

Liñán, F., & Chen, Y.-W. (2009). Development and Cross-Cultural Application of a Specific Instrument to Measure Entrepreneurial Intentions. *Entrepreneurship Theory and Practice*, 593–617. https://doi.org/10.1111/j.1540-6520.2009.00318.x

Liu, L., Zhou, L., Sharma, P., Alzeiby, E. A., & Dash, S. (2026). Triple helix trust and spillovers for sustainable innovation: The role of governance, openness, and digital infrastructure. *Technological Forecasting and Social Change*, *225*. https://doi.org/10.1016/j.techfore.2026.124548

Ma, L., Lan, Z., & Tan, R. (2020). Influencing factors of innovation and entrepreneurship education based on the theory of planned behavior. *International Journal of Emerging Technologies in Learning*, *15*(13), 190–206. https://doi.org/10.3991/ijet.v15i13.15345

Manzi-Puertas, M. A., Agirre-Aramburu, I., Urzelai, B., & Lopez-Perez, S. (2025). Bridging bricolage and effectuation: The mediating role of innovative behavior in student entrepreneurial action under resource constraints. *Journal of Entrepreneurship, Management and Innovation*, *21*(3), 54–76. https://doi.org/10.7341/20252133

Marcon, M. L., Provensi, T., Stenger, E. A. F., Tonial, G., & Sehnem, S. (2026). Mapping the Uncharted: Theoretical and Methodological Gaps in Sustainable Entrepreneurship Research. In *Sustainable Development* (Vol. 34, Number S1, pp. 1501–1523). John Wiley and Sons Ltd. https://doi.org/10.1002/sd.70239

Mensah, I. K., Zeng, G., Luo, C., Xiao, Z., & Lu, M. (2021). Exploring the Predictors of Chinese College Students' Entrepreneurial Intention. *SAGE Open*, *11*(3). https://doi.org/10.1177/21582440211029941

Milohnić, I., & Licul, I. (2025). THE FACTORS INFLUENCING STUDENTS' ENTREPRENEURIAL INTENTIONS: AN ANALYSIS USING THE THEORY OF PLANNED BEHAVIOR. *Economic Horizons*, *27*(1), 77–92. https://doi.org/10.5937/ekonhor2501079M

Pascucci, S. (2023). Sustainable entrepreneurship research: Narratives, tensions and future agendas. In *De Gruyter Handbook of Sustainable Entrepreneurship Research* (pp. 29–44). De Gruyter. https://doi.org/10.1515/9783110756159-003

Paul, J., Modi, A., & Patel, J. (2016). Predicting green product consumption using theory of planned behavior and reasoned action. *Journal of Retailing and Consumer Services*, *29*, 123–134. https://doi.org/https://doi.org/10.1016/j.jretconser.2015.11.006

Pavlou, P. A., & Fygenson, M. (2006). Understanding and Predicting Electronic Commerce Adoption: An Extension of the Theory of Planned. *MIS Quarterly*, *30*(1), 115–143. http://www.jstor.org/stable/25148720.

Schaltegger, S., & Wagner, M. (2011). Sustainable entrepreneurship and sustainability innovation: Categories and interactions. *Business Strategy and the Environment*, *20*(4), 222–237. https://doi.org/10.1002/bse.682

Shahrahmani, M., Aflatoonian, B., Mirzaei, H., Bahremand, B., & Aflatoonian, B. (2025). Sustainable entrepreneurship models dynamics and key drivers of societal and environmental impact. In *Discover Sustainability* (Vol. 6, Number 1). Springer Nature. https://doi.org/10.1007/s43621-025-01945-9

Souitaris, V., Zerbinati, S., & Al-Laham, A. (2007). Do entrepreneurship programmes raise entrepreneurial intention of science and engineering students? The effect of learning, inspiration and resources. *Journal of Business Venturing*, *22*(4), 566–591. https://doi.org/https://doi.org/10.1016/j.jbusvent.2006.05.002

Teece, D. J. (2007). Explicating dynamic capabilities: The nature and microfoundations of (sustainable) enterprise performance. *Strategic Management Journal*, *28*(13), 1319–1350. https://doi.org/10.1002/smj.640

Thananusak, T. (2019). Science mapping of the knowledge base on sustainable entrepreneurship, 1996-2019. In *Sustainability (Switzerland)* (Vol. 11, Number 13). MDPI. https://doi.org/10.3390/su11133565

Tounés, A., Gribaa, F., & Messeghem, K. (2015). An exploratory model of the environmental intention of SME directors in Tunisia. In *Handbook of Entrepreneurship and Sustainable Development Research* (pp. 229–257). Edward Elgar Publishing Ltd. https://doi.org/10.4337/9781849808248.00019

Tran, V. H., Vu, T. N., Pham, H. T., Nguyen, T. P. T., & Duong, C. D. (2024). Closing the entrepreneurial attitude-intention-behavior gap: the direct and moderating role of entrepreneurship education. *Journal of International Education in Business*, *17*(1), 107–132. https://doi.org/10.1108/JIEB-05-2023-0026

Wagner, M. (2017). Entrepreneurship, innovation and sustainability. In *Entrepreneurship, Innovation and Sustainability*. Taylor and Francis. https://doi.org/10.4324/9781351277761

Wu, J.-H., & Wang, S.-C. (2005). What drives mobile commerce?: An empirical evaluation of the revised technology acceptance model. *Information & Management*, *42*(5), 719–729. https://doi.org/https://doi.org/10.1016/j.im.2004.07.001

Yimsook, N. (2025). A causal relationship model of social entrepreneurial behavior among social entrepreneurs in Thailand. *Kasetsart Journal of Social Sciences*, *46*(2). https://doi.org/10.34044/j.kjss.2025.46.2.11

Zhang, X., Liu, J., Fan, O., & Yuan, X. (2025). Research on triple helix innovation behaviour selection and influencing factors in innovation ecosystem. *Technology Analysis and Strategic Management*, *37*(11), 2221–2239. https://doi.org/10.1080/09537325.2024.2348642