

Entrepreneurship Learning and Its Impact on Innovation-Based Growth

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Abstract

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Entrepreneurship education has become a strategic approach to driving innovation-based economic growth. This article aims to analyze the relationship between entrepreneurship education and innovation-driven growth through a review of recent literature. The method involves a systematic examination of international scholarly articles published. The findings reveal that entrepreneurship education enhances business literacy, creative abilities, and innovative tendencies among learners, which collectively contribute to the creation of new ventures, innovative products, and economic efficiency. This article also highlights the importance of adaptive and collaborative curricula that emphasize critical thinking, problem-solving, and risk-taking skills. The practical implications include the formulation of educational policies that support an innovative ecosystem and encourage the emergence of technology-based entrepreneurs. Therefore, entrepreneurship education not only produces new business founders but also empowers change agents in the broader transformation of an innovation-based economy. The study underscores the strategic value of integrating innovation and education to foster sustainable and inclusive economic development in the digital era.

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1. Introduction

In an increasingly complex and dynamic digital economy, entrepreneurship has taken a central position as a key driver for sustainable economic growth. The global shift from a natural resource-based economy to a knowledge-based economy has positioned innovation as the main foundation for long-term economic development. In this context, entrepreneurship education is no longer seen merely as an effort to directly create employment, but has evolved into a strategic instrument for fostering innovative capabilities in individuals, communities, and even nations as a whole. Entrepreneurship education encompasses a series of pedagogical approaches systematically designed to enhance the understanding, skills, and entrepreneurial attitudes of students. Its primary goal is not only to produce a large number of new entrepreneurs, but also to shape an adaptive, creative, resilient, and risk-tolerant mindset a characteristic of today's innovators. Various studies have shown that individuals exposed to entrepreneurship education have a much higher tendency to pursue innovative business opportunities and create new products or services with the potential to transform markets and generate significant economic value (Hameed & Irfan, 2019).

On the other hand, innovation-based growth is an economic development approach that specifically emphasizes the importance of creating new knowledge, cutting-edge technology, and disruptive business models (Suchek et al., 2021). In this context, innovation does not only refer to the invention of new technologies, but also includes processes, systems, and managerial approaches that can improve operational efficiency, labor productivity, and overall competitiveness.

Entrepreneurship education provides a safe and supportive learning environment where experimentation, collaboration, and the development of innovative solutions can be systematically and structurally facilitated (Hägg & Gabrielsson, 2020).

However, it is important to note that the effectiveness of entrepreneurship education in strengthening innovation capacity is highly dependent on the curriculum design implemented, the teaching methods used, and the existence of an adequate supporting ecosystem. Curricula that emphasize project-based learning, team collaboration, and active involvement from industry practitioners have proven more successful in developing innovative attitudes in students (Otache al., 2021). Furthermore, access to funding, the availability of business incubators, and support from pro-innovation government policies are important factors that further strengthen the impact of entrepreneurship education on achieving economic growth. Although much evidence has shown a positive relationship between entrepreneurship education and innovation, there remains a gap in understanding how this mechanism works in detail, especially in the context of different education systems across various regions.

Therefore, this study specifically aims to systematically review the latest literature related to the role of entrepreneurship education in supporting innovation-based economic growth, with a focus on mediating variables such as creativity, digital literacy, and market orientation. By combining various academic perspectives from accredited international journals between 2018–2022, this paper is expected to provide theoretical and practical contributions for the development of education policy, capacity building of learning institutions, and decision-making by

stakeholders in creating an inclusive and sustainable innovation ecosystem. This study is also important in broadening the academic and policy discourse on the importance of aligning higher education with the real needs of the digital economy, and preparing a young generation that is not only ready to work, but also ready to create and innovate sustainably.

2. Literature Review

2.1. Entrepreneurship Education as an Innovative Instrument

Entrepreneurship education plays a crucial role as one of the important mediums in instilling and shaping an innovative mindset among the younger generation who are increasingly facing complex challenges in the digital economy era. In the view of Ramsgaard and Christensen (2018), entrepreneurship education structured with an experiential learning approach or real-world experience is capable of shaping innovative behavior in students. This is especially reflected through various training activities based on business simulations and real case studies from the business world. Through these simulations and case studies, students not only learn theoretically, but also gain relevant practical understanding of the market challenges and opportunities they face in the real world.

Curriculum that emphasize direct involvement in business practices enable students to understand market dynamics more deeply and encourage them to develop creative and relevant solutions to real problems in society. In addition, project-based learning and problem-based learning approaches have also proven very effective in fostering critical thinking and innovative problem-solving abilities.

According to findings from Hägg and Gabrielsson (2020) says students participating in entrepreneurship programs with such active approaches show a much higher tendency to create technology-based solutions or develop new, innovative, and market-relevant business models.

2.2. Relationship Between Entrepreneurship Education and Innovation Growth

The correlation between entrepreneurship education and innovation-based growth has been one of the main concerns in various international literatures in recent years. This reflects the importance of a deep understanding of how education can be a driving force for innovation in the context of an increasingly developing digital economy. In research conducted by Otache et al. (2021), it was shown that entrepreneurship education significantly influences various important variables such as individual innovation orientation, readiness for technology adoption, and the level of participant involvement in competitive markets. Entrepreneurship programs that effectively integrate the use of digital technology and online collaborative tools can accelerate the innovation process and improve the quality of business ideas developed by students.

Furthermore, in a study conducted by Wu et al. (2019), it was found that students who are actively exposed to entrepreneurship education have a much higher tendency to develop and create innovative technology-based businesses or digital platforms. The effect of this type of education is not only temporary, but also long-term, as it can increase individual adaptability and strengthen their exploratory skills in facing changes and dynamics of the highly competitive global market. Therefore,

entrepreneurship education can be seen as a strategic investment that continuously and systematically strengthens the innovative capacity of future generations.

2.3. Supporting Factors for the Effectiveness of Entrepreneurship Learning

The main factors determining the success of entrepreneurship education in driving innovation include the existence of adequate infrastructure support, active involvement of experienced industry practitioners, and supportive government policies that encourage the growth of the entrepreneurial ecosystem. According to Zotov et al. (2019), business incubators that directly collaborate with higher education institutions have proven capable of providing real and concrete facilities for students to test and develop their innovative ideas. In addition, the involvement of professional mentors and industry players with direct field experience also plays an important role in accelerating the entrepreneurship learning process and refining innovative products being developed by students.

Entrepreneurship curriculum that are flexible and adaptive to rapid technological changes are also a very important element. In a study conducted by Corvello et al. (2022), it was found that the comprehensive integration of digital technology into the entrepreneurship learning process encourages students to experiment and develop various digital platform-based business models, including e-commerce, financial technology (fintech), and educational technology (edutech). These findings clearly demonstrate that visionary entrepreneurship education that is responsive to digital technology developments will become more relevant and have a greater impact in shaping a sustainable, progressive, and competitive and a collaborative network of academic institutions, industry players, government

agencies, startups, and investors that collectively foster, support, and accelerate the creation and diffusion of innovative ideas, technologies, and business models.

3. Method

This study was conducted using a systematic literature review approach aimed at examining the relationship between entrepreneurship education and innovation-based economic growth. The method used is qualitative exploratory, with an emphasis on conceptual and thematic analysis of various relevant academic literatures published. This timeframe was intentionally chosen to ensure that the context of the reviewed literature aligns with the developments of digital transformation and global dynamics influencing the current education and innovation landscape. The literature sources analyzed in this study came from international scientific journals accessed through the Google Scholar platform. In the article search process, specific keywords such as "entrepreneurship education", "innovation-based growth", "entrepreneurial mindset", "digital entrepreneurship", and "entrepreneurship and innovation" were used.

The search focus was directed at peer-reviewed journals within the scope of economics, management, education, and technology disciplines. Articles analyzed were selected based on several criteria, including being in English, available in full text, having a primary focus on the relationship between entrepreneurship education and innovation, and published in indexed international journals between 2018 and 2022. Meanwhile, articles that did not undergo a peer-review process, were based on local case studies that were difficult to generalize, or only focused on social

entrepreneurship and microfinance without explicit links to innovation, were excluded from the analysis.

After the initial identification process, selection was made based on abstracts and keywords, followed by a comprehensive content analysis of the selected articles. Data was analyzed using a thematic content analysis approach, aiming to find patterns, conceptual relationships, and existing research gaps. Articles were then coded based on main themes, types of methodological approaches, and findings related to the relationship between entrepreneurship education and innovation creation. To increase the accuracy and reliability of the findings, triangulation among researchers and cross-verification of sources referenced in each article were performed. The final results were compiled in an argumentative narrative to comprehensively describe the contribution of entrepreneurship education to innovation-based economic growth, including its complexities, contexts, and accompanying global dynamics.

4. Results

The results of this literature study clearly show that entrepreneurship education makes a very significant contribution to innovation-based economic growth. From a comprehensive analysis of systematically selected and relevant international academic journals, a consistent and strong pattern was found that entrepreneurship learning is truly capable of developing students' cognitive and affective skills, which are important foundations in the entire innovative process, both at the individual, organizational, and broader economic development levels.

Most of the articles analyzed in depth highlight the importance of developing an entrepreneurship curriculum based on real practice and direct experience. In research conducted by Hägg and Gabrielsson (2020), it was found that entrepreneurship programs designed with elements of business simulation, startup incubation activities, and real problem-based projects had a very significant impact on increasing students' creativity levels. These programs not only introduce theoretical concepts of entrepreneurship, but also provide actual space for direct exploration and testing of business ideas. This is in line with the findings of Otache et al. (2021), which showed that students actively involved in various entrepreneurial activities experienced a substantial increase in divergent thinking, the ability to explore new ideas, and an increase in tolerance for ambiguity or uncertainty all of which are important and crucial elements in the process of continuous innovation.

Supporting external factors such as involvement from the industry, availability of access to innovation funds, and mentoring systems from professional business actors further strengthen the positive impact of entrepreneurship education on the birth of various innovative outcomes. As comprehensively described in the study by Corvello et al. (2022), direct participation of business practitioners and industry players in the learning process, whether as guest lecturers, mentors, or project partners, provides real and actual insights into the challenges and real opportunities in the market. This type of interaction encourages students to think more strategically and create solutions that are not only creative but also commercially relevant and have high market potential and strong competitiveness.

Reviewed literature also strongly emphasizes the importance of technology integration in the implementation of contemporary entrepreneurship education. Use of various digital platforms in the learning process such as e-learning applications, business simulation software, and online collaborative platforms can encourage the creation of interdisciplinary learning models. This approach also opens up opportunities for collaboration among students from different fields of study and even from different countries. In a learning environment optimally supported by digital technology, students have wider and more flexible opportunities to access the latest market data, analyze global trends, and validate the business ideas they develop through a data-driven decision-making approach. This environment also allows for rapid adaptation to market changes and safer experimentation with innovative ideas without high financial risk (Lescrauwaet et al., 2022).

From a macroeconomic perspective, entrepreneurship education has proven to be an important catalyst in shaping and strengthening national and international innovation ecosystems. In a study conducted by Wu et al. (2019), it was found that higher education graduates equipped with entrepreneurship learning tend to be more ready and capable of creating innovative technology-based businesses. These new businesses are not only productive and disruptive, but also contribute to the creation of new jobs that absorb skilled labor and accelerate industrial transformation towards digitalization. This shows that entrepreneurship education does not merely prepare individuals to become entrepreneurs in a narrow sense, but shapes them as agents of innovation who can have a systemic impact within a much wider and more complex economic system.

Strong relationship between entrepreneurial intention and innovation is also an important finding from a number of reviewed studies. In a study by Ramsgaard and Christensen (2018), it was revealed that the intention to become an entrepreneur in individuals is strengthened by psychological factors such as self-efficacy (belief in one's own ability), locus of control (perception of control over achieved outcomes), and internal motivation (intrinsic motivation), all of which are obtained through an effective entrepreneurship learning process. These psychological factors have proven to play a significant role in mediating the relationship between entrepreneurship education and the innovative outcomes produced by students. In other words, entrepreneurship learning that can touch affective and psychological aspects will directly impact participants' motivation to create new things and dare to take risks in innovating.

However, it must be acknowledged that the results of this study also reveal a number of limitations and challenges in the entrepreneurship education approach, which need to be considered by education policymakers and higher education institutions. One of the main challenges is the still significant gap between theory and practice that often occurs in various educational institutions. Some studies, as explained by Zotov et al. (2019), emphasize that although entrepreneurship curricula have included innovation aspects in their syllabi, implementation in the field is often still theoretical, not contextual, and less relevant to the dynamics of industry and constantly evolving market needs. This disconnect between theory and practice makes it increasingly difficult for students to relate the concepts they learn in the classroom to the complex and evolving challenges they are likely to encounter in the

real-world business and industrial environment. Without practical exposure or real-life applications, theoretical knowledge often remains abstract and detached from its intended purpose (Männikkö & Husu, 2019). As a result, students may struggle to apply what they have learned to solve actual problems, make strategic decisions, or innovate effectively in professional settings. This gap highlights the urgent need for educational programs particularly in entrepreneurship to integrate experiential learning, industry collaboration, and project-based approaches that mirror real market dynamics.

In addition, the reviewed literature also highlights the importance of developing a more systematic, measurable, and outcome-based evaluation framework to assess the effectiveness of entrepreneurship education programs on innovative achievement. A study conducted by Hameed and Irfan (2019) specifically states the need for measurement indicators that do not only focus on inputs (e.g., number of students or training sessions) or processes (such as teaching methods), but more on concrete, measurable outcomes, such as the number of new products produced, the number of successful startups founded by alumni, or innovative business models successfully validated and implemented. This type of outcome-based evaluation is very important to provide a more accurate and objective picture to stakeholders regarding the extent to which entrepreneurship education makes a real contribution to economic innovation and social transformation.

The literature analyzed in this study shows a very strong, consistent, and positive relationship between entrepreneurship education and innovation, both at the individual level (students, graduates, or new entrepreneurs), organizational level

(educational institutions, incubators, or startups), and at the overall macroeconomic level. Entrepreneurship education not only enhances the readiness and competitiveness of graduates in facing a competitive and ever-changing job market, but also plays an active role in creating an ecosystem conducive to the birth of innovative startups, the development of new technologies, and inclusive, collaborative, and sustainable economic growth. Thus, entrepreneurship education holds a strategic position as a bridge between individual potential and the needs of the global innovation economy, and serves as a driving force for change in the continuously evolving and requiring an ongoing, flexible, and strategic adaptation of the global innovation ecosystem in order to effectively respond to rapid technological changes, evolving market demands, and complex socio-economic transformations.

5. Discussion

The results of this literature study clearly confirm that entrepreneurship education makes a very significant contribution to the creation of innovative processes that drive sustainable economic growth in various contexts. Entrepreneurship education not only plays a role in producing new entrepreneurs, but also acts as a catalyst for the formation of a dynamic and resilient innovation ecosystem. However, it must be understood that the positive impact of entrepreneurship education on innovation is not automatic. This influence is highly dependent on various supporting factors, especially the quality of the curriculum design implemented, the extent to which institutional support is consistently

available, and the strength of the synergy established with external actors such as the industry sector, government, funding institutions, and investors.

In this regard, there are at least three main issues that deserve deeper examination in an effort to increase the effectiveness of entrepreneurship education as a driver of innovation. A redefinition or reformulation of the entrepreneurship curriculum is needed so that it does not only focus on business creation, but also on strengthening the innovative capacity of students. A modern and contextual curriculum must be able to directly involve aspects of digitalization, design thinking approaches, and provide a comprehensive understanding of the constantly changing and uncertain global market dynamics. This type of approach will encourage students to think critically, exploratively, and be able to create innovative and relevant solutions (Lee & Trimi, 2018).

The importance of an outcome-based evaluation approach in assessing the success of entrepreneurship education needs to be a primary concern (Japee & Oza, 2021). Currently, most entrepreneurship education evaluations are still descriptive and only focus on inputs or learning processes. This is not enough to capture the complexity of the innovative outputs produced by program participants. Therefore, more concrete and measurable evaluation metrics and indicators need to be designed, such as the number of innovative products successfully produced, the number of new startups founded by graduates, or new business models successfully developed and implemented in the real world. This outcome-based evaluation will help educational institutions and policymakers objectively assess program effectiveness and improve aspects that are still suboptimal.

Various analyzed literatures show that inclusivity is a key factor in optimizing the impact of entrepreneurship education on innovation-based growth. This inclusivity covers various important aspects, such as equitable access to entrepreneurship education for marginalized communities, interdisciplinary integration to create rich collaborative perspectives, and strengthening cooperation between sectors be it academic, business, government, or civil society (Ellis-Robinson & Coles, 2021). By building a collaborative, participatory, and problem-solving-oriented learning ecosystem, entrepreneurship education can become a major driving force in creating growth that is not only fast and efficient, but also just, inclusive, and socially and economically sustainable.

Furthermore, the limitations found in various analyzed articles and studies also indicate an urgent need to design entrepreneurship education models that are more contextual and responsive to technological developments, market demands, and ongoing social changes. By implementing an adaptive, dynamic, and needs-based approach, entrepreneurship education will remain relevant and be able to play its role as an agent of transformation in a knowledge-based economic era characterized by accelerated innovation, digitalization, and continuous global disruption.

6. Conclusion

Based on the literature analysis of 15 relevant international scientific articles, it can be concluded that entrepreneurship education consistently has a very positive impact on innovation-based economic growth. Entrepreneurship education has proven capable of increasing students' capacity for critical thinking, solving complex

problems, working collaboratively, and creatively and strategically exploring technology. Through the strengthening of these skills, entrepreneurship education participants show great potential in creating various innovative solutions that are relevant to market needs and have a real impact on strengthening competitiveness and sustainable economic growth. In addition, entrepreneurship learning also contributes significantly to shaping an adaptive, resilient, and open mindset towards risk and uncertainty all of these characteristics are key aspects for innovators and value creators in the competitive modern economy. However, the effectiveness and long-term impact of this entrepreneurship education are highly dependent on the quality of its curriculum planning and implementation, the existence of a solid supporting ecosystem, and the level of close integration between the world of education and the industrial sector. Thus, to maximize the full potential of entrepreneurship education as a driving force for innovation-based economic growth, a more adaptive, holistic, integrated, and inclusive learning model design is needed. Investing in entrepreneurship education is a strategic investment, not only in individuals, but also in a more dynamic, competitive, and sustainable economic future.

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