

Transforming Entrepreneurship Education in Higher Education: Experiential, Collaborative, and Ecosystem-Based Perspectives

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ABSTRACT

Entrepreneurship education has become a strategic priority in higher education institutions in response to rapid economic transformation and the growing demand for innovative human resources. This study aims to synthesize and categorize contemporary models of entrepreneurship learning to identify dominant pedagogical patterns and strategic directions for implementation. Using a qualitative literature review approach, thirty empirical and conceptual studies were analyzed to examine their learning models, findings, and recommendations. The analysis reveals four major thematic clusters. First, experiential and practice-based models (such as Teaching Factory, project-based learning, production-based training, and experiential-reflective frameworks) emphasize authentic engagement and real-world business simulation to develop entrepreneurial competence and mindset. Second, curriculum integration and institutional ecosystem support highlight the importance of structured learning pathways, policy alignment, and industry collaboration. Third, social and collaborative approaches underscore entrepreneurship as a socially constructed process shaped by teamwork, mentorship, community engagement, and networks. Fourth, innovation-driven and context-responsive models integrate digital technologies, game-based learning, and culturally grounded approaches to enhance relevance and adaptability. The findings indicate that effective entrepreneurship education requires a holistic ecosystem that integrates experiential pedagogy, institutional commitment, collaborative processes, and technological innovation. Successful implementation depends on curriculum coherence, qualified educators, adequate infrastructure, and continuous evaluation

mechanisms. This study contributes to the theoretical and practical development of entrepreneurship education by offering an integrated framework that supports the cultivation of an entrepreneurial mindset, competence, and sustainable societal impact.

Keywords

Collaborative Learning
Curriculum Integration
Entrepreneurial Mindset
Entrepreneurship
Education
Experiential Learning
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Introduction

Globalization in the 21st century has brought significant changes across various sectors of human life, including economic, social, cultural, political, and particularly educational domains [1]. Education plays a crucial role in improving the quality of human resources through the development of cognitive and psychomotor skills, thereby enhancing individual productivity and competitiveness [2]. In the field of entrepreneurship, education serves as a strategic foundation for the establishment and sustainable development of industrial and business units. The better an individual's understanding and education in entrepreneurship, the greater the potential for improving welfare and enhancing industrial quality. In line with this perspective, Rhenald Kasali emphasizes that young entrepreneurs play a vital role as agents of change who are capable of responding to global challenges, fostering innovation, and creating new economic opportunities. According to Kasali, higher education institutions should function as transformative spaces that encourage students to develop an entrepreneurial mindset, the courage to take calculated risks, and the ability to create value (*value creation*) in the context of global competition [3]. Therefore, entrepreneurship education courses in higher education institutions need to be designed using innovative learning models to foster the emergence of adaptive and globally competitive young entrepreneurs.

Entrepreneurship education has become one of the main focuses in human resource development in the era of globalization. Recent review studies confirm that experiential pedagogy (experiential learning), including project-based learning and business simulation, is effective in improving students' practical competence and entrepreneurial attitudes, especially when accompanied by structured reflection and academic/practitioner mentoring [4]. Entrepreneurship education is defined as an effort that leads to efforts to find, creating, implement new ways of working, technology, and products to increase efficiency and facilitate

society [5]. According to Thomas W. Zimmerer in [6], entrepreneurship education is a process of learning to apply innovation and creativity in terms of solving problems and taking advantage of opportunities faced by others every day. This statement means that this entrepreneurship education is very beneficial not only for yourself, but also for others.

The implementation of entrepreneurship education in the national university environment is carried out gradually and sustainably with various models. Directorate of Higher Education, as an institution that oversees university-level education, has enacted entrepreneurship education as one of the courses in the composition of the university curriculum in all fields of study [7]. This is because universities have a strategic role in equipping students with relevant entrepreneurial skills and attitudes to face the challenges of the world of work. Contextual research in Indonesia found that entrepreneurship programs that integrate mentoring, practical experience, and collaboration with the business world show greater effectiveness in fostering students' entrepreneurial readiness; Therefore, the proposed learning model must be adjusted to local conditions (local wisdom, facilities, and campus policies) [8].

Universities not only provide a theoretical foundation for entrepreneurship concepts but also play a crucial role in shaping students' mindsets, behaviors, and perspectives to develop a generation equipped with both soft skills and hard skills in entrepreneurship [9]. Students are trained to develop competencies, recognize opportunities, manage risks, and make strategic decisions. In this context, a holistic approach to entrepreneurship education is essential, as it emphasizes the integration of cognitive, affective, and psychomotor domains in the learning process. Such an approach enables students to connect knowledge, attitudes, and practical skills in a meaningful way, thereby preparing them to respond adaptively to the dynamic demands of the modern business world [10].

Transformative learning, as articulated by Mezirow, focuses on a fundamental process of change in individuals' frames of reference, assumptions, and perspectives through critical reflection on learning experiences. The primary objective of transformative learning is not merely the enhancement of skills, but the development of new ways of thinking that are more reflective, inclusive, and autonomous. In the context of entrepreneurship education, this approach plays a crucial role in fostering students' critical awareness of risk, uncertainty, and the social responsibilities inherent in entrepreneurial activities.

However, despite the integration of entrepreneurship education into higher education curricula, its implementation often remains dominated by theoretical instruction and traditional business knowledge transfer [11]. As a result, many graduates lack the entrepreneurial drive, critical awareness, and capacity to transform innovative ideas into sustainable ventures. Previous studies indicate that existing learning models are still limited

in integrating practical experience, emotional engagement, and reflective processes required to foster innovative and resilient entrepreneurs. This condition highlights the need for a transformative learning orientation, in which entrepreneurship education goes beyond skill acquisition to facilitate changes in students' perspectives, self-concepts, and ways of interpreting entrepreneurial challenges.

Although holistic learning and transformative learning both emphasize meaningful learning experiences, they represent distinct theoretical constructs. Holistic learning is oriented toward the integration of multiple learning domains within the learner, whereas transformative learning places greater emphasis on perspective transformation and the development of critical consciousness as the primary outcomes of the learning process. Accordingly, a learning model may be holistic in nature without necessarily producing deep perspective transformation, while another model may be transformative even if it does not explicitly integrate all learning domains.

In the context of rapid technological change, economic uncertainty, and complex social challenges, entrepreneurship education can no longer be confined to economic outcomes alone. Future-oriented entrepreneurship education must equip students with the ability to identify opportunities, solve problems creatively, take calculated risks, and adapt to changing environments [13]. More importantly, it should also cultivate ethical values, social responsibility, and sustainability awareness. However, existing entrepreneurship education models tend to emphasize either practical skill development or attitudinal formation, without sufficiently integrating holistic learning dimensions with transformative learning processes. This gap indicates the need for a more comprehensive conceptual framework in entrepreneurship education.

To address this gap, a holistic and transformative approach to entrepreneurship education is required. This approach integrates innovative learning models that combine active learning experiences, mentoring, reflection, and collaboration with real-world entrepreneurial contexts. Therefore, this study aims to present and synthesize various innovative entrepreneurship education models through the lens of holistic and transformative learning. By doing so, the study seeks to clarify how different learning models contribute to the development of students' entrepreneurial spirit, either through holistic integration of learning domains, transformative changes in perspective, or a combination of both.

Holistic learning is an educational approach that views learners as whole individuals and emphasizes the integration of multiple learning domains, namely cognitive, affective, and psychomotor aspects. Miller argues that holistic learning is not solely oriented toward the acquisition of academic knowledge but also toward the balanced development of learners' emotional, social, and personal value dimensions. In the context of entrepreneurship education,

a holistic approach enables students to simultaneously integrate conceptual understanding, entrepreneurial attitudes, and practical skills, thereby making the learning process more meaningful and contextually grounded.

Based on this conceptual distinction, the entrepreneurship learning models examined in this study are framed into three main categories: holistically oriented models, transformatively oriented models, and holistic-transformative hybrid models. Some models primarily emphasize the integration of learning domains to develop comprehensive entrepreneurial competencies, while others place greater emphasis on critical reflection and students' perspective transformation. This framework serves as the analytical basis for examining how each learning model contributes to the development of students' entrepreneurial spirit.

Material and Methods

This study employed a Systematic Literature Review (SLR) method aimed at systematically identifying, evaluating, and synthesizing previous studies relevant to holistic and transformative entrepreneurship education learning models. The SLR approach was selected because it enables researchers to obtain a comprehensive overview of effective entrepreneurial learning approaches and models in enhancing students' entrepreneurial spirit based on widely available empirical evidence in the scientific literature [14], [15].

The implementation of the Systematic Literature Review followed a series of structured stages designed to minimize bias and enhance the reliability of the review findings. These stages were adapted from the SLR procedures proposed by Scott, which include data collection, literature selection, data analysis, and conclusion drawing [16]. Literature searches were conducted using the *Publish or Perish* application by accessing the Scopus and Google Scholar databases to capture a broad range of relevant publications.

The literature search strategy employed key terms such as entrepreneurship education, entrepreneurial learning models, innovative learning models, and transformative learning. The search was limited to publications released between 2015 and 2025 to ensure alignment with recent developments in entrepreneurship education. All retrieved records were compiled, and duplicate articles were removed before the initial screening stage.

Literature selection was conducted based on predefined inclusion and exclusion criteria. The inclusion criteria comprised: (1) articles published in reputable scientific journals or international conference proceedings, (2) studies addressing entrepreneurship learning models in higher education, (3) publications available in English or Indonesian, and (4) studies published between 2015 and 2025. In this study, the term *reputable journals* refers to journals indexed in the Scopus database within Quartiles Q1–Q3 or nationally accredited journals that adhere to peer-review standards. Articles that were irrelevant to the research focus,

unavailable in full-text form, or failed to meet methodological quality requirements were excluded from the analysis. Language restrictions were applied to ensure accuracy of interpretation; however, this limitation may potentially introduce language bias [17].

The study selection process followed the PRISMA 2020 guidelines, encompassing four stages: identification, screening, eligibility assessment, and inclusion. During the identification stage, 215 articles were retrieved from the Scopus and Google Scholar databases. After duplicate removal and title and abstract screening, irrelevant articles were excluded. Full-text assessment for eligibility resulted in 30 articles that met the inclusion criteria and were subsequently analyzed. The study selection process is illustrated in the PRISMA flow diagram.

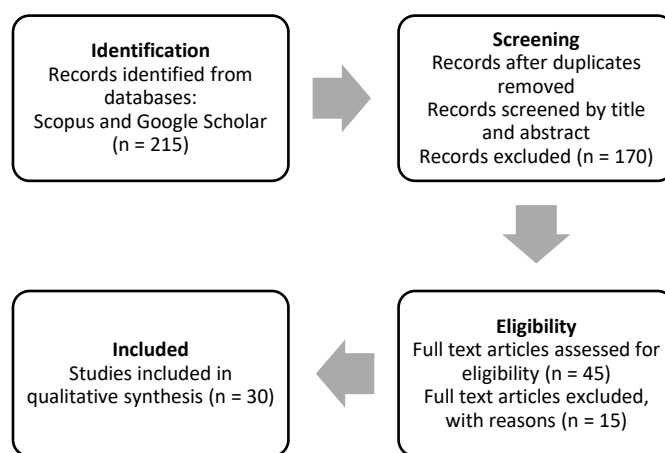


Fig. 1. PRISMA 2020 Flow Diagram of Study Selection

Fig. 1 presents the PRISMA 2020 flow diagram of study identification and selection. The data reduction process was conducted in a gradual and systematic manner to ensure that only relevant and high-quality studies were included in the final synthesis. Of the 215 articles identified during the initial stage, a substantial number were excluded during title and abstract screening due to irrelevance to the research focus, non-empirical descriptive content, or the absence of an explicit discussion of entrepreneurship learning models. During the full-text eligibility assessment, articles were excluded if they failed to meet methodological criteria, were unavailable in full-text form, or were not published in journals that met the predefined quality standards. Detailed reasons for article exclusion at each stage of the selection process are presented in an additional table to enhance the transparency of the Systematic Literature Review process.

Data analysis was conducted using thematic analysis, which involved the stages of open coding, categorization, and theme development [18]. The coding process was carried out independently by two researchers to enhance analytical objectivity. Inter-rater agreement was assessed using Cohen's Kappa coefficient as an indicator of the reliability of thematic coding and consistency of data interpretation [19].

Results

As a result of a literature review of 30 sources, researchers found many learning models that can be applied in holistic and transformative entrepreneurship education. The findings of the data collection steps that have been analyzed so that they are in accordance with the relevant topic and in accordance with the research objectives are described in Table 2.

Rather than presenting the five identified entrepreneurship learning models as having equal weight, this study organizes the findings using a differentiated analytical framework. The models are classified based on three key dimensions: pedagogical approach (constructivist, experiential, and problem-based), educational level (secondary and higher education), and primary outcome focus (skill development, mindset transformation, and entrepreneurial intention). This classification provides a clearer structure for interpreting the results and highlights how each learning model contributes differently to entrepreneurship education outcomes.

Table 2. List of Analyzed Research Results

No.	Authors	Findings	Recommendations	Ref.
1.	Sholeh et al.	Various models of entrepreneurship education can be applied, including an integrated model in learning, an entrepreneurship subject model, an entrepreneurship-based learning model that teaches process skills to create something, an entrepreneurial education model based on religious character, an experiential entrepreneurial learning model, and a community-based entrepreneurship education model	The application of this model is expected to face challenges such as resource limitations, theoretical and practical gaps, and adequate industry support. Universities need to take strategic steps so that the learning model is implemented successfully.	[20]
2.	Chrismardani	The development of student entrepreneurship requires a continuous learning model that synergizes government policies and a gradual curriculum. This curriculum includes instilling a mindset, business experience, start-ups, and business development so that young entrepreneurs are prepared.	The existence of superior programs of universities and DIKTI in the field of entrepreneurship can indirectly develop students' hard skills and soft skills in entrepreneurship.	[21]
3.	Ismiyanti et al.	The government encourages entrepreneurship in all university majors to meet the needs of the 21st century economy. The Ministry of Education and Culture creates a valid, effective, and practical independence-based entrepreneurship model, including opportunity identification, production improvement, marketing, administration, and networking.	There are entrepreneurship competition programs in universities organized by DIKTI, including independent entrepreneurship programs, P2MW, MBKM, and so on, to empower students with knowledge, skills, and support to start their own businesses.	[22]
4.	Kurniawan	The Teaching Factory learning model (TF-6M) integrates entrepreneurship education to instill entrepreneurial values and mentality through an industry-based school environment with the aim of forming entrepreneurial competencies and interests.	The need for support from schools in the form of adequate facilities, so that the learning model can be implemented properly	[23]

No.	Authors	Findings	Recommendations	Ref.
5.	Dewi et al.	The development of an entrepreneurial learning model based on e-commerce projects for university students to innovate in their learning.	The existence of technology supports the course of this learning model.	[24]
6.	Purbaningrum and Soenarto	The Great Young Entrepreneur's learning model is a learning model to form entrepreneurial work so that it can produce entrepreneurs with a creative and innovative mindset. Starting from planning a business, starting, building, maintaining a business, and running a business on its own.	The need for a curriculum, syllabus, and infrastructure facilities that support the implementation of entrepreneurship education so that mental ability, aptitude, and attitude can be formed by school graduates.	[25]
7.	Vestia et al.	The learning methods applied include the division of student work groups determined based on student learning styles (learning style inventory), adopted from Kolb, McCarty, and learning project-based entrepreneurship, adopted from The George Lucas Educational Foundation.	The need for a curriculum, syllabus, and infrastructure that support the implementation of education.	[26]
8.	Sapir et al.	The integrated learning model developed from a social and personality perspective developed from the creative industry in Magetan has given the impression that entrepreneurial learning goes through 3 stages: parents have a great influence in the development of a person's mindset, the macro environment has a great opportunity to develop entrepreneurial creativity, and so on.	Parents have a big role as supporters for the success of their children in developing entrepreneurship through instilling character values from an early age.	[27]
9.	Haq	The PjBL learning model integrated into entrepreneurial learning shows that the model has an impact on increasing interest in learning, entrepreneurship, entrepreneurial nature, entrepreneurial understanding, leadership spirit, and innovation in students.	The ability of teachers/lecturers to implement the learning model must be qualified, and they must be prepared to adjust the teaching tools.	[28]
10.	Mukminin and Purwanti	The production-based learning model has several stages that educators need to follow to actively facilitate student infrastructure, participate and interact competently, and provide entrepreneurial programs that encourage student innovation.	The need for support from schools in the form of adequate facilities, so that the learning model can be implemented properly	[29]
11.	Wati	The PjBL learning model is considered to be able to increase students' mastery of soft skills and hard skills that must be fulfilled by an entrepreneur. The resulting projects are in the form of business proposals, products, and packaging labels.	The need for a curriculum, syllabus, and infrastructure that supports the implementation of entrepreneurship education so that mental ability, aptitude, and attitude can be formed in students.	[30]
12.	Kusuma and Pramesti	The teacherpreneur learning model was developed with the Quantum Learning syntax. The TLM model syntax has 7 syntax, namely Potential, Intuitive, Conceptual, Management, Sustainable, Collaborative, Sharing, and Caring.	The importance of students having competence and developing their skills through their potential to be able to face the challenges of the world in the future. This model is considered to be able to facilitate prospective educators to develop the potential of entrepreneurial soft skills and hard skills.	[31]

No.	Authors	Findings	Recommendations	Ref.
13.	Hasanah et al.	The teaching factory learning model is able to increase the readiness of students' entrepreneurial spirit. Through the stages of implementing concepts to practice in the field, this model is very profitable and significant for preparing students for entrepreneurship.	This model can be applied to foster the readiness of students to be entrepreneurial because it can instill an entrepreneurial mindset.	[32]
14.	Ardana	Entrepreneurship education by applying the discovery learning model reaches a positive category for application in learning. There are many advantages obtained, one of which is the group learning system, where students can help each other.	The discovery learning model in entrepreneurship learning can increase students' learning motivation so that it can be applied by other educators in the classroom.	[33]
15.	Mitasari and Rusdarti	The production-based training learning model is a learning model that unites the production process with entrepreneurial learning as a form of providing student learning experience.	This model can be applied, taking into account environmental conditions and future needs.	[34]
16.	Kagan	The cooperative learning model The feedback and showdown carousel model, is a learning model where students are asked to solve problems through the process of data discovery, developing ideas, and evaluation by other groups.	The need for solid cooperation between one group and another. This model is good for fostering a social sense of entrepreneurship.	[35]
17.	Marwanti et al.	The cooperative-based learning model includes 4 steps, namely brainstorming, job shadowing, training, and mentoring. After the steps are implemented, an evaluation of the learning course is carried out.	It is hoped that students can think critically, have entrepreneurial intentions, and be ready to start a new business.	[36]
18.	Halid	The entrepreneurial problem-solving learning model is a learning model that presents the material by giving students a problem that must be solved in terms of entrepreneurship. This is done to form an independent entrepreneurial spirit and think critically.	This model is expected to be implemented by teachers optimally so that it can encourage student motivation to learn in accordance with the basic competencies that must be achieved.	[37]
19.	Dewi et al.	The ethnopedia-based entrepreneurial learning model is generally effective when implemented at the elementary level. Student learning outcomes are getting better, and students' activeness in learning is increasing.	It is more important to develop a more applicable learning model that combines culture, character, and science.	[38]
20.	Wiratama et al.	The QD (Quick On The Draw) type cooperative learning method allows students to work together to think critically, actively, creatively, and democratically. This model has been proven to improve students' entrepreneurial learning outcomes.	The need for a longer time in learning, so teachers need to provide additional tasks outside of learning so that knowledge can be conveyed optimally.	[39]
21.	Pihie and Sani	The student-centered learning model allows students to have a positive entrepreneurial mindset. The learning techniques that are passed are running a real business, visits to business locations, and interviews with entrepreneurs.	Entrepreneurship education at the university must consider Teaching techniques that require students to practice directly.	[40]
22.	Roslan et al.	The social entrepreneurship learning model using social network analysis has 3 steps, namely engagement, training, and motivation. This model is expected to have a great impact on the community in the field of entrepreneurship in the future.	To develop entrepreneurship in the future, this research needs to be expanded, which can also have an impact on both government and non-government organizations.	[41]
23.	Bagheri and Pihie	Entrepreneurship education with an entrepreneurial leadership development	The need for agencies to facilitate relevant speakers	[42]

No.	Authors	Findings	Recommendations	Ref.
		model. The model that became the idea was based on the dynamic process of experiential, social, interactive, observational, and reflective learning, as well as entrepreneurial leadership education and research.	and very deep knowledge about leadership to carry out the learning.	
24.	Wenger	The social learning process is one of the learning models in entrepreneurship education. One must be actively involved in practicing the effort. 4 components characterize this model, namely meaning, practice, community, and identity.	The course of entrepreneurship is adjusted to human dynamics	[43]
25.	Badzińska	The experiential learning model is an approach based on experiential learning to support students in solving real business problems by interacting in teams.	Experiential learning models can be implemented and proven to bring real benefits.	[44]
26.	Suonpää	The Center's collaborative learning model consists of 4 steps, namely planning to realize opportunities, taking collective action, choosing companies, and creating collaborative businesses and opportunities exploration.	This collaborative learning model is advantageous for expanding entrepreneurial networks.	[45]
27.	Nugroho	The Triple-I (Inspired, innovative, Indonesian) learning model in entrepreneurship education is very well implemented because it has been implemented in several well-known universities in Indonesia.	There needs to be socialization with other universities to implement the model.	[46]
28.	La Guardia et al.	The game-based learning model is carried out with the aim of developing an entrepreneurial mindset in students through the implementation of project games in the European Union. From the game, students will get entrepreneurial experience.	Students need to be guided efficiently and effectively to gain entrepreneurial experience from the game.	[47]
29.	Esmi et al.	Teaching learning methods are delivered in a systematic, organized, logical, and consistent manner according to the learning objectives. emphasizing teaching methods of business planning, case studies, starting a business by students, business games, student entrepreneurial teams and networks, internships in small companies, feasibility studies, communication training, getting advice on starting a small business, distance education, and cooperation	Students can participate in more challenging educational activities and consequently, gain experience that provides some insight to discover and create entrepreneurial opportunities.	[48]
30.	Petkova	The theory of entrepreneurial learning with the performance errors learning model applies to how entrepreneurs generate results, and based on those results, detect and correct errors in their own knowledge of the activities involved in creating and operating a new venture.	The need for a thorough evaluation team to carry out this learning so that mistakes can be detected and used as future learning.	[49]

Discussion

Based on the results of a literature review of 30 sources of articles on the entrepreneurial learning model, it was found that there are a lot of entrepreneurial learning models that are effectively used in learning. The entrepreneurial learning model used by each educational institution/institution is different. The existence of this learning model not only benefits students by making it easier to understand learning, but it also helps educators in facilitating the delivery of material so that it reaches students. The entrepreneurial learning

model has a very important role in preparing students to become successful prospective entrepreneurs. These models not only provide theoretical knowledge about entrepreneurship, but also train the practical skills needed to start and manage a business. According to the researcher, innovative learning models that are relevant and effective in delivering entrepreneurial education learning materials for students to improve the entrepreneurial spirit of students are as follows,

A. Experiential and Practice-Based Entrepreneurship Learning

A dominant theme across the literature is the emphasis on experiential, project-based, and production-based learning models in entrepreneurship education. These approaches position students as active agents who learn through real or simulated business practice rather than passive content reception. Models such as Teaching Factory (TF-6M) [23], [32], production-based learning [29], [34], project-based learning (PjBL) [28], [30], and experiential learning frameworks [44] consistently demonstrate improvements in entrepreneurial competence, motivation, and readiness. Experiential models are grounded in the assumption that entrepreneurial capability develops through iterative engagement with authentic tasks. For example, PjBL enhances students' soft and hard skills by requiring them to design business proposals, develop products, and manage packaging and branding [30]. Similarly, Teaching Factory models simulate industry environments within educational institutions, fostering entrepreneurial mentality and bridging the gap between theory and practice [23], [32]. Production-based training integrates the production process directly into learning activities, allowing students to experience value creation firsthand [34]. Theoretically, these findings align with experiential and reflective learning principles [42], [44], where knowledge is constructed through action, feedback, and reflection. The entrepreneurial problem-solving model [37] and performance error-based learning theory [49] further emphasize learning through mistakes, reinforcing adaptive expertise. Such models promote critical thinking, innovation, and independence—core attributes of entrepreneurial identity. However, successful implementation requires institutional readiness, including adequate infrastructure, qualified instructors, and industry collaboration [23], [29]. Without systemic support, experiential approaches risk becoming superficial simulations rather than transformative learning experiences. Overall, the literature strongly supports experiential entrepreneurship education as an effective pathway to cultivating an entrepreneurial mindset, resilience, and applied competence in higher education contexts.

B. Curriculum Integration and Institutional Support Systems

A second major theme concerns curriculum design, policy alignment, and institutional ecosystems supporting entrepreneurship education. Several studies emphasize that entrepreneurship development requires structured, continuous, and policy-synergized

curriculum models rather than isolated courses [21], [22]. Chrismardani [21] highlights the importance of a gradual curriculum that integrates mindset formation, business exposure, startup incubation, and business development stages. This aligns with government-driven initiatives promoting entrepreneurship across all university majors to meet 21st-century economic demands [22]. National programs such as independent entrepreneurship schemes and freedom curriculum initiatives provide structural reinforcement that extends learning beyond classroom boundaries [22]. Integrated entrepreneurship models [20] and the Great Young Entrepreneur framework [25] stress the need for supportive curriculum documents (syllabi), facilities, and strategic planning to ensure implementation fidelity. Similarly, Triple-I (Inspired, Innovative, Indonesian) learning models demonstrate scalability when institutional commitment exists [46]. Systematic and logically structured teaching methods—ranging from business planning and internships to business games and feasibility studies—further reflect institutionalized entrepreneurship education strategies [48]. These findings suggest that entrepreneurship education is not merely pedagogical but systemic. Universities must align curriculum, infrastructure, policy, and external partnerships to create a coherent entrepreneurial ecosystem. Industry collaboration, funding mechanisms, and mentorship programs are essential to bridge academic learning with real-market dynamics [20], [48]. Nevertheless, resource limitations and theoretical-practical gaps remain challenges [20]. Institutions must therefore adopt strategic leadership and long-term planning to ensure sustainability. The literature indicates that entrepreneurship education flourishes when embedded within a comprehensive institutional framework that integrates curriculum innovation, government policy, and ecosystem support.

C. Social, Collaborative, and Community-Based Learning Approaches

The third theme highlights entrepreneurship education as a socially constructed process facilitated through collaboration, networking, and community engagement. Cooperative learning models [35], [36], collaborative learning frameworks [45], and social learning theory [43] emphasize that entrepreneurial competence emerges through interaction within communities of practice. Wenger's social learning theory [43] conceptualizes entrepreneurship learning as identity formation shaped by meaning, practice, community, and belonging. This perspective is reinforced by cooperative models such as feedback carousel and brainstorming–mentoring cycles [35], [36], which encourage teamwork, peer evaluation, and shared problem-solving. These methods not only develop business knowledge but also foster social responsibility and leadership capacity. Social entrepreneurship models utilizing network analysis [41] and center collaborative learning approaches [45] expand entrepreneurship beyond individual profit orientation toward community impact and network expansion. Student-centered approaches involving real business visits and

entrepreneur interviews further strengthen authentic engagement [40]. These collaborative processes cultivate entrepreneurial intention, critical thinking, and opportunity recognition [36], [40]. Importantly, social and personality perspectives underline the influence of parents and macro-environmental contexts in shaping entrepreneurial mindset [27]. Entrepreneurship, therefore, is embedded within broader socio-cultural systems. Effective models recognize these external influences and integrate community participation. However, collaboration requires structured facilitation and time allocation [39]. Without strong coordination, group dynamics may limit effectiveness. Overall, the literature positions entrepreneurship education as a relational and community-driven endeavor where knowledge, identity, and innovation emerge through collective interaction and shared practice.

D. Innovation, Technology, and Cultural Context in Entrepreneurship Learning

The final theme concerns the integration of technology, innovation, and cultural context in entrepreneurship education. Digital transformation and localized cultural adaptation are increasingly shaping entrepreneurial pedagogy. E-commerce project-based learning models demonstrate how technology facilitates innovation and market engagement [24]. Game-based learning approaches similarly simulate entrepreneurial environments, enabling experiential learning through digital or structured play [47]. Such models enhance creativity, risk-taking, and strategic decision-making. Moreover, systematic and technology-enabled distance education expands access to entrepreneurial knowledge [48]. Innovation-oriented frameworks like the Teacherpreneur model [31] and discovery learning [33] encourage learners to explore their potential and develop creative solutions. These models cultivate adaptability, leadership, and future-oriented competencies. The QD cooperative method [39] also demonstrates how structured, active strategies can enhance entrepreneurial outcomes. Culturally grounded models, such as ethnopedia-based entrepreneurship learning [38], integrate local wisdom, character education, and scientific knowledge. This contextualization ensures that entrepreneurship education remains socially relevant and culturally responsive. The Triple-I model [46] similarly emphasizes national identity and innovation synergy. These findings suggest that effective entrepreneurship education must be adaptive—leveraging technological tools while remaining sensitive to cultural and contextual realities. Innovation is not solely technological but also pedagogical and socio-cultural. However, effective implementation requires teacher competence, curriculum flexibility, and continuous evaluation mechanisms [37], [49]. In conclusion, technology-enhanced and culturally responsive models strengthen entrepreneurial mindset formation by aligning global innovation trends with local relevance, thereby preparing students to navigate dynamic economic environments.

Implications and Recommendations

A. Implications

The findings across the four thematic clusters generate several important theoretical, pedagogical, and institutional implications for entrepreneurship education.

First, the dominance of experiential and practice-based models implies that entrepreneurship learning should shift decisively from content transmission toward action-oriented pedagogy. Models such as Teaching Factory, PjBL, production-based learning, and experiential frameworks demonstrate that entrepreneurial competence develops through authentic engagement with real or simulated business environments. Therefore, entrepreneurship education must be designed as a competency-building process rather than a purely cognitive subject. This reinforces constructivist and experiential learning theories, positioning students as creators of value rather than recipients of knowledge.

Second, the literature indicates that entrepreneurship education functions optimally within a systemic institutional ecosystem. Curriculum alignment, government policy integration, infrastructure readiness, and industry collaboration are not peripheral factors but central determinants of program success. Entrepreneurship cannot be treated as an isolated course; it requires structured pathways—from mindset formation to business incubation and scaling—supported by institutional leadership and strategic planning.

Third, the strong presence of social and collaborative learning models highlights that entrepreneurship is socially embedded. Entrepreneurial identity, leadership, and opportunity recognition are shaped through interaction, mentorship, community engagement, and networking. Thus, entrepreneurship education should intentionally cultivate communities of practice, peer learning systems, and social capital development.

Fourth, innovation, digital integration, and cultural contextualization indicate that entrepreneurship education must remain adaptive. Technology-enhanced learning (e-commerce projects, game-based simulations, distance education) expands experiential opportunities, while culturally grounded models ensure relevance and sustainability. Entrepreneurship education must therefore balance global competitiveness with local wisdom and socio-cultural values.

B. Recommendations

Based on these implications, several strategic recommendations are proposed:

1. **Adopt Experiential-Centered Curriculum Design.** Universities should prioritize project-based, production-based, and industry-simulated learning models. Assessment systems must evaluate not only theoretical understanding but also innovation, feasibility, teamwork, and reflective capacity.

2. **Strengthen Institutional Ecosystems.** Higher education institutions should integrate entrepreneurship across disciplines and establish structured pathways, including incubation programs, mentorship networks, and partnerships with industry and government. Dedicated entrepreneurship centers can coordinate competitions, startup support, and funding access.
3. **Enhance Lecturer Competence and Professional Development.** Educators require continuous training in experiential facilitation, digital tools, mentoring strategies, and industry engagement. Without capable facilitators, innovative models may not reach their full impact.
4. **Leverage Digital Technologies Strategically.** Institutions should integrate e-commerce platforms, business simulations, digital marketing tools, and online collaboration systems to reflect real-world entrepreneurial environments.
5. **Embed Cultural and Community Contexts.** Entrepreneurship programs should incorporate local economic potential, cultural values, and community-based opportunities to ensure contextual relevance and social impact.
6. **Establish Continuous Evaluation Mechanisms.** Implement structured monitoring systems that include performance reflection, feedback loops, and error-based learning evaluation to ensure sustainability and improvement.

Overall, entrepreneurship education should evolve into an integrated, experiential, collaborative, and innovation-driven ecosystem that systematically nurtures an entrepreneurial mindset, competence, and societal contribution.

Conclusion

This review synthesizes diverse models of entrepreneurship education and reveals four dominant orientations: experiential and practice-based learning, curriculum and institutional integration, social and collaborative approaches, and innovation- and context-driven models. Collectively, the literature demonstrates that entrepreneurship education is most effective when it moves beyond theoretical instruction and positions learners as active creators of value within authentic or simulated business environments.

Experiential models (such as Teaching Factory, project-based learning, production-based training, and experiential-reflective frameworks) consistently show strong potential in cultivating entrepreneurial competence, mindset, resilience, and innovation capacity. These approaches enable students to integrate knowledge, skills, and attitudes through direct engagement with real-world challenges. However, their effectiveness depends heavily on institutional readiness, infrastructure, and instructor competence.

At the systemic level, entrepreneurship education requires structured curriculum pathways and ecosystem support. Policy alignment, industry partnerships, incubation

programs, and government initiatives play a crucial role in sustaining entrepreneurial development. Entrepreneurship should not be treated as a standalone subject but as an integrated institutional mission embedded across disciplines.

Furthermore, entrepreneurship learning is inherently social and contextual. Collaborative models, community engagement, and social learning frameworks highlight the importance of interaction, identity formation, and network development. Cultural relevance and technological adaptation further strengthen the responsiveness of entrepreneurship education to contemporary economic demands.

In conclusion, entrepreneurship education must be designed as a holistic ecosystem—experiential in pedagogy, systemic in structure, collaborative in process, and innovative in orientation. Institutions that strategically integrate these dimensions will be better positioned to cultivate graduates who are not only entrepreneurial in skill but also adaptive, socially responsible, and capable of contributing meaningfully to dynamic local and global economies.

Conflict of Interest

The authors declare that there is no conflict of interest.

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