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# A Literature Review on Conditional Effectiveness of Entrepreneurship Education (EE) in Higher Education

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## ABSTRACT

*The literature review synthesizes recent academic findings on the effectiveness of Entrepreneurship Education (EE) within Higher Education Institutions (HEIs). Moving beyond simple direct-effect models, the review explores the nuanced factors shaping EE outcomes by examining three critical themes: the psychological mechanisms (mediators) that translate EE into Entrepreneurial Intention (EI) and Entrepreneurial Alertness (EA); the influence of contextual moderators (like entrepreneurial climate and national setting); and the essential pedagogical shift toward experiential, co-created, and digital learning environments. Findings confirm that EE's positive impact is contingent and mediated by internal psychological states, such as Entrepreneurial Mindset, Perceived Behavioral Control, and Entrepreneurial Passion. Moreover, the institutional Entrepreneurial Climate acts as a powerful moderator, amplifying curricular success. Crucially, the literature advocates for moving toward authentic, action-based models—including Virtual Entrepreneurship Practice (VEP) and social network integration—to better cultivate tangible skills. Despite these advancements, the review highlights the persistent gap between Entrepreneurial Intention (EI) and actual Entrepreneurial Behavior (EB) as the primary challenge. This synthesis concludes that effective EE requires an ecosystemic, tailored approach that activates psychological mediators and prioritizes rigorous longitudinal research focused on bridging the intention-to-behavior chasm.*

***Keywords**: Entrepreneurship Education (EE), Higher Education Institutions (HEIs), Conditional Effectiveness, Entrepreneurial Intention (EI), Entrepreneurial Behavior (EB).*

## Introduction

Entrepreneurship education (EE) has globally emerged as a critical pedagogical intervention designed to cultivate entrepreneurial talent, drive economic growth, and address skills deficits in higher education institutions (HEIs). While the overarching goal of EE is universally accepted—to foster the capabilities necessary for new venture creation—the empirical evidence regarding its direct, uniform impact has often been conflicting and complex. Moving beyond simple input-output models that link EE exposure directly to outcomes, contemporary research has focused on the nuanced mechanisms and contextual factors that shape its true effectiveness.

This literature review aims to synthesize recent academic findings regarding the perspectives, practices, and outcomes of entrepreneurship education within the HE context. Specifically, it examines three critical themes: (1) the psychological and process mechanisms (mediators) through which EE influences Entrepreneurial Intention (EI) and Entrepreneurial Alertness (EA); (2) the role of contextual moderators, such as institutional climate and national setting, in amplifying or diminishing EE's impact;

and (3) the crucial pedagogical shift from traditional, theoretical instruction toward experiential, co-created, and digital learning environments required to bridge the persistent gap between entrepreneurial intention and actual Entrepreneurial Behavior (EB). By integrating these diverse findings, this review provides a sophisticated, conditional understanding of EE effectiveness and identifies key directions for future research and curriculum design.

Entrepreneurship education has emerged globally as a critical mechanism for developing entrepreneurial intent and cultivating entrepreneurial talent. The existing body of research highlights the role of formal education, exposure to entrepreneurial ecosystems, and innovative pedagogies in shaping students' entrepreneurial mindsets.

**Area of Study**

The Conditional Effectiveness of Entrepreneurship Education (EE) in Higher Education.

This area is investigated through synthesis on:

- Psychological Mechanisms (Mediators)
- Contextual Factors (Moderators)
- Pedagogical Approaches and their role in addressing the Intention-Behavior Gap.

**Entrepreneurial Intent and Higher Education**

- **Core Concept and Findings**

Entrepreneurial intent (EI) is conceptualized as the conscious conviction to establish a new business venture (Thompson, 2009). It is often analyzed through the lens of Ajzen's Theory of Planned Behavior, which posits that intentions are shaped by attitudes, perceived behavioral control, and subjective norms. Maharana and Chaudhury (2022) examined EI among students in private and government universities in Odisha, India. Their findings suggest that exposure to entrepreneurship education (EEE), quality of entrepreneurship education (QEE), extracurricular activities (ECA), and parental occupation are significant determinants of EI. Interestingly, academic achievement and socio-economic status did not significantly influence entrepreneurial intent, indicating that entrepreneurial drive is more affected by experiential and contextual factors rather than academic performance or family wealth Virtual Entrepreneurship and Innovative Pedagogies

While traditional university education influences EI, innovative approaches such as virtual entrepreneurship practice are increasingly gaining traction. An and Xu (2021) emphasized the importance of simulation-based, digital, and practice-oriented environments in cultivating entrepreneurial talents in Chinese higher education institutions. Their study revealed that students often possess weak entrepreneurial awareness and psychological preparedness despite exposure to entrepreneurship knowledge. Virtual practice, particularly through Maker spaces and digital platforms, was recommended to strengthen students' entrepreneurial spirit, risk-taking ability, and innovation capacity

- **Comparative Insights**

Both studies converge on the notion that mere knowledge acquisition is insufficient. (Maharana and Chaudhury) show that government universities lag in QEE and EEE compared to private institutions, limiting students' entrepreneurial intent. Similarly, (An and Xu) argue that even when knowledge structures are adequate, without practical and immersive experiences (such as virtual simulations), entrepreneurial qualities remain underdeveloped. Thus, experiential learning — whether through extracurricular engagement or virtual practice — appears to be a consistent driver of entrepreneurial readiness.

- **Gaps and Future Directions**

The literature indicates a global consensus that entrepreneurship education must go beyond classroom teaching. However, the approaches differ by context. Indian studies highlight structural and institutional disparities, while Chinese research focuses on blended models (traditional coursework/ virtual simulations/ extracurricular practice) can be designed across diverse cultural and institutional contexts to foster entrepreneurial intent more effectively.

Maharana & Chaudhury (2022) found that exposure to entrepreneurship education strongly affects entrepreneurial intent in Odisha, India. In contrast, An & Xu (2021) argued that in China, the challenge lies not in exposure but in cultivating resilience and risk-taking ability through virtual practice. Thus, while both studies stress the importance of education, they differ in aspects of education is most critical.

**Entrepreneurship Education, Digital Transformation, and Talent Cultivation**

- **Core Concepts**

Focused on the complexities, mechanisms, and contextual factors influencing the effectiveness of **Entrepreneurship Education (EE)** in higher education institutions (HEIs). The literature collectively highlights that EE's impact on entrepreneurial outcomes is not direct, but rather is contingent on mediating psychological factors, disaggregated skill components (like soft skills), and the integration of modern digital and virtual practice technologies.

- **Entrepreneurship Education and Intentional Outcomes (Dabbous Amal and et al.)**

The role of Entrepreneurship Education (EE) in promoting entrepreneurial outcomes is a central theme, though the literature acknowledges conflicting results regarding its influence. EE is broadly perceived as a teaching intervention mechanism intended to inspire and increase entrepreneurial activity, potentially yielding economic growth

  - **Entrepreneurial Intention (EI):** In a study of business students in Lebanon, EE was found to influence Entrepreneurial Intention (EI), but this relationship was fully mediated by Perceived Behavioral Control (PBC). This suggests that EE does not directly make students want to start a business, but rather works by increasing their self-belief in their ability to do so. Additionally, personal (risk aversion) and contextual (social support) factors were found to exert a direct impact on EI.
  - **Entrepreneurial Readiness:** Separately, research focused on African systems suggests a need to disaggregate the EE concept, moving beyond describing the teaching concept as a whole. Specifically, the focus shifts to entrepreneurial readinessas an outcome determined by soft skills.

- **The Influence of Technology and Virtual Practice (Dabbous Amal and et al. 2023 and Hengjie An and Yuanyuan Xu 2021)**

The integration of technology, particularly in the current digital era, is viewed as an unavoidable trend in entrepreneurship and innovation research.

  - **Artificial Intelligence (AI) and Intention:** The research examining AI posits that the **performance expectancy of AI solutions** (the belief that using AI will improve job performance) significantly influences **Perceived Behavioral Control (PBC)**, which in turn promotes entrepreneurial intention. This frames AI not merely as a tool, but as an external driver that can alleviate major uncertainties associated with new ventures, thereby boosting confidence in one's ability to succeed.
  - **Virtual Entrepreneurship Practice:** Another study focuses on the implementation of **virtual entrepreneurship practice** as a "scientific and up-to-date practical teaching mode" within Chinese higher education. The adoption of technologies like the Internet of Things (IoT) and AI is proposed to construct an **online-offline Maker space** paradigm to improve students' innovation and entrepreneurship ability

- **Disaggregated Skills and Contextual Mechanisms (Simba et al.(**2025))

The literature emphasizes the need to move beyond a monolithic view of EE to examine the effects of its individual components, particularly **soft skills**, which represent entrepreneurial behaviors, attitudes, and attributes.

  - **Soft Skills and Mediation (African Context):** In a study of aspiring South African entrepreneurs, **soft skills** determine entrepreneurial readiness. Crucially, the impact of soft skills on the ability to start, innovate, finance, and grow new ventures is mediated by the entrepreneurial processes (e.g., opportunity identification, validation, and exploitation) that define their entrepreneurial journeys. This finding is important for contextualizing theory, as soft skills in Africa's HEI systems are embedded in cultural and societal values, such as *Ubuntu*, which focus on collectivism and social responsibility.
  - **Quality vs. Knowledge (Chinese Context; An and Yuanyuan Xu 2021):** An analysis of students involved in virtual practice revealed that subjects generally lack entrepreneurial quality (awareness, and psychological quality) rather than a deficit in entrepreneurial knowledge structure. The data showed that a significant number of students do not fully

understand entrepreneurship, concern themselves with risk, and take a negative attitude toward entrepreneurial failure. This result directly informs policy suggestions to improve the entrepreneurship curriculum, teaching staff, and external practice bases.

**Synthesis and Findings**

The collective findings suggest a sophisticated understanding of contemporary EE, moving away from simple input-output models. The success of EE is dependent on three primary mechanisms:

- **Psychological Mediation:** Factors like **Perceived Behavioral Control (PBC)**are critical mediators through which both traditional EE and new digital tools (like AI's performance expectancy) successfully translate into entrepreneurial intentions.
- **Process Mediation:** The effects of specific components, such as **soft skills**, are channeled and realized through the subsequent **entrepreneurial processes** that bridge readiness to actual venture creation and growth.
- **Contextual and Quality Focus:** Effective EE implementation must address the **entrepreneurial quality** and psychological preparedness of students, especially in terms of risk and failure perception. Furthermore, the design and evaluation of EE components, particularly soft skills, must be sensitive to local. S**ocio-cultural contexts** to ensure relevance and effectiveness

**Research Gaps**

- **Cross-Cultural and Comparative Analysis of Mediation:** While the studies identify critical mediators (PBC, Entrepreneurial Processes), a direct comparative study is needed to understand how the *type* of mediator (psychological vs. process-based) varies in importance across diverse geographical and economic contexts (e.g., Lebanon, South Africa, and China).(Dabbous, Boustani(2023) and Simba et al.(2025)
- **Longitudinal Impact of Digital Tools:** The effect of AI performance expectancy and VEP is measured at a single point in time. Future research should use longitudinal designs to track if the boost in PBCor "entrepreneurial quality" translates into actual, sustained venture creation and long-term business performance.
- **Refining Soft Skills Measurement in Digital Environments: (**Simba et al.) Disaggregate soft skills in a traditional context. A gap exists in understanding and measuring the specific digital soft skills(e.g., remote collaboration, data analysis readiness) that are critical for success in the Digital Explosion environment studied by Dabbous & Boustani.

**The Role of Environment and Pedagogy in Entrepreneurship Education**

- **Core Concepts and Definitions**

The literature consistently frames **Entrepreneurship Education (EE)** as a crucial intervention within Higher Education (HE) aimed at cultivating key personal and professional attributes in students. **Zhang, Li, Zeng, Zhang, & Lu (2022)** defined EE as a curriculum designed to foster entrepreneurial spirits and competencies, with the ultimate goal being the cultivation of **Entrepreneurial Intention (EI)**, or the student's subjective willingness to start a venture.

Beyond the curriculum itself, the **learning environment** is established as a critical external factor. **Ilonen (2021)** explored this environment from the educator's perspective, defining the **Entrepreneurial Learning Environment (ELE)**as a self-regulatory, co-created setting where active **Entrepreneurial Learning** occurs, typically through team-based, real-life actions. Similarly, **Chen, Tang, and Han (2022)** focused on the impact of a **Diverse Learning Environment (DLE)** on the development of **Entrepreneurial Competencies (EC)**, positing that this external factor works through internal psychological and cognitive mechanisms such as **Knowledge Transfer (KNT)**, **Self-Efficacy (SEE)**, and **Cognitive Flexibility (COF)**.

**Methodology**

The three studies employed distinct methodologies to address different aspects of EE effectiveness.

**Zhang et al. (2022)** conducted a rigorous **meta-analysis** to synthesize the often-conflicting empirical findings regarding the EE-EI relationship. Their work analyzed data from 36 records, comprising nearly 30,000 students, allowing for robust generalization and moderator analysis across different contexts.

In contrast, **Ilonen (2021)** utilized a **qualitative study** involving interviews with entrepreneurship educators and documentary data. This approach was necessary to fulfill the research gap of understanding the educator's perspective, focusing on the pedagogical *how* of creating the ELE rather than simply measuring its outcome.

Finally, **Chen et al. (2022)** employed a **quantitative** survey-based approach to test their theoretical model of entrepreneurial competencies. Their analysis, which involved structural equation modeling (SEM), focused on establishing the mediated and moderated relationships between the learning environment and competency outcomes, ensuring high reliability and validity of their constructs.

**Findings**

The collective findings confirm that EE is effective, but its impact is nuanced and context-dependent.

**Zhang et al. (2022)** provided strong evidence through their meta-analysis, concluding that EE holds a significant **positive association with Entrepreneurial Intention (EI)**. Crucially, they identified that **national context is a moderator**, finding the EE-EI relationship to be markedly stronger among Chinese college students than those from other countries included in the synthesis.

Investigating the mechanisms of competency development, **Chen et al. (2022)** confirmed that a **Diverse Learning Environment (DLE)**significantly promotes **Entrepreneurial Competencies (EC)**. However, this effect is entirely *mediated* by the internal factors of **Knowledge Transfer (KNT), Self-Efficacy (SEE), and Cognitive Flexibility (COF)**. Furthermore, they demonstrated that **EE itself moderates the effect of Self-Efficacy** on EC, indicating that formal education strengthens the power of self-belief.

From the pedagogical perspective, **Ilonen (2021)** reported that educators consistently define the optimal ELE as a **self-regulatory, co-created setting**. The educators emphasized the need for **adjustable co-creation** within a structured format, advocating for diverse student teams to facilitate learning through action and complementary skill utilization.

**Gaps in Research**

Despite these comprehensive findings, the literature points to several avenues for future work:

- **Educator-Centric Research:** As articulated by **Ilonen (2021)**, the majority of EE research has focused on students or curriculum content, neglecting the essential role and educational know-how of the **educator**. Further qualitative studies are needed to share and standardize effective pedagogical practices.
- **Specific Mechanism of EE:** While **Zhang et al. (2022)** provided a conclusive summary of the overall EE-EI relationship, they acknowledged the need to investigate **specific sub-dimensions** of EE as moderators, moving beyond the aggregated EE construct.
- **DLE and Competency Nuances: Chen et al. (2022)** highlighted that few studies examine the enhancement of **Entrepreneurial Competencies (EC)**from the perspective of the **Diverse Learning Environment (DLE)**. There remains a gap in research detailing the intrinsic link between the DLE and the complex set of EC, rather than simply measuring general awareness or behavior.

**From Entrepreneurship Education to Intentional Action and Behavior**

Investigating the impact of **Entrepreneurship (EE)**, particularly focusing on the mechanisms (mediators and moderators) that link educational exposure to actual entrepreneurial outcomes, spanning both intention and behavior.

- **Core Concepts and Definitions**

The reviewed literature addresses the complex pathway from EE to venture creation, focusing on several key constructs:

  - **Entrepreneurship Education (EE):** Defined across the studies as formal curricula designed to cultivate entrepreneurial spirit, competencies, and knowledge (Zhang et al., 2022; Hou et al., 2022).
  - **Entrepreneurial Intention (EI):** The subjective state or willingness of a student to engage in entrepreneurial activities (Zhang et al., 2022).

- **Entrepreneurial Behavior (EB):** The actual steps taken or actions performed in the process of starting a venture (Rauch & Hulsink, 2015).
- **Opportunity Recognition:** A cognitive mediator through which EE is processed, defined as the ability to identify potential markets or gaps (Hou et al., 2022).
- **Entrepreneurial Learning:** A moderating factor representing the depth and engagement of a student in the learning process, which is argued to strengthen the impact of EE (Hou et al., 2022).

**Methodology**

The studies utilize varied and complementary methodologies, collectively providing robust insight across different levels of analysis:

- **Meta-Analysis (Zhang et al., 2022):** This study employed a rigorous **meta-analytic** approach, synthesizing findings from **36 empirical records** involving a large sample of over 29,000 college students. This method allowed the authors to statistically confirm the general relationship between EE and EI while testing for contextual moderators, such as national setting.
- **Multilevel Quantitative Model (Hou et al., 2022): Hou et al.** developed and tested a complex **multilevel model** using survey data. Their approach was designed to simultaneously analyze mediating effects (Opportunity Recognition) and moderating effects (Entrepreneurial Learning) on the EE-EI relationship, providing a detailed understanding of the mechanism of influence.
- **Longitudinal/Quantitative Study (Rauch & Hulsink, 2015): Rauch and Hulsink**utilized a **longitudinal design** to track the impact of EE on students over time, moving beyond intention to assess **Entrepreneurial Behavior (EB)**. This approach is essential for assessing true educational effectiveness, as it addresses the critical gap between stating an intent and taking action.

**Findings**

The collective findings establish the positive, yet complex, influence of EE on student outcomes:

- **EE and Intention: Zhang et al. (2022)** conclusively found a **positive association between EE and EI** across the literature. Crucially, they identified that **national context is a significant moderator**, with the relationship being **stronger for Chinese college students** compared to other contexts examined.
- **Mechanisms of Intention: Hou et al. (2022)** elaborated on the mechanism of influence, finding that the positive effect of **EE on EI is mediated by Opportunity Recognition**. Furthermore, **Entrepreneurial Learning** serves as a **moderator**, amplifying the effectiveness of EE when students are more deeply engaged in the learning process.
- **EE and Behavior:** Moving beyond intention, **Rauch and Hulsink (2015)** demonstrated that the impact of **EE on Entrepreneurial Behavior (EB)**, while small, is **statistically significant**. Notably, the positive effect of EE was **strongest for students who already possessed a high initial intention** to act, suggesting EE serves more to facilitate and structure action for committed students than to convert uncommitted ones.

**Research Gaps**

- The synthesized literature highlights two major areas for future scholarly investigation: **Bridging Intention to Behavior: Rauch and Hulsink (2015)** emphasize the continuing gap between the high intention promoted by EE and the relatively lower rates of actual **Entrepreneurial Behavior (EB)**. Future research must identify and test the specific post-educational factors or curricular designs (beyond initial intention) that effectively translate EI into tangible action.
- **Disaggregating and Contextualizing EE:**While **Zhang et al. (2022)** confirmed the EE-EI relationship and **Hou et al. (2022)** identified specific mechanisms (Opportunity Recognition, Learning), the field needs more research on the **specific sub-dimensions** of EE that drive these mediators. Furthermore, the role of contextual factors beyond just the national level (e.g., specific university ecosystem, peer influence) requires deeper multilevel analysis (Hou et al., 2022).

**Advancing on Entrepreneurship Education (EE) has expanded beyond measuring mere Entrepreneurial Intention (EI) to explore sophisticated mechanisms of learning, competency development, and environmental context. EE is consistently defined as formal learning designed to foster entrepreneurial skills, competencies, and mindset**

- **Entrepreneurial Mindset (EM) and Competencies (EC):** Cui (2021) focuses on EM as a key outcome, while Wang et al. (2019) examine the development of various skills (e.g., technical, opportunity, strategic) defined as EC.
- **Contextual Learning:** The literature emphasizes that learning extends beyond the classroom. **Social Networks** and **Context** are identified as essential learning mechanisms in the real-world path to entrepreneurship (Wasim, Youssef, Christodoulou, & Reinhardt, 2023). This is complemented by the concept of **Entrepreneurial Climate**, which refers to the institutional environment that supports entrepreneurial development (Cui, 2021).
- **Pedagogical Approaches:** Studies differentiate between **traditional EE**(often theoretical and knowledge-based) and **new types of EE** (experiential, practice-oriented, or virtual), examining how these approaches impact student outcomes (Wang et al., 2019). The concept of **Co-Creation** in Sustainable Entrepreneurship Education (SEE) is also introduced, focusing on educational partnerships between universities and businesses (Okuogume & Toledano, 2024).

**Methodology**

The studies utilize a mix of quantitative modeling, qualitative inquiry, and targeted survey analysis to address the complexities of EE delivery and effectiveness:

- **Quantitative Structural Equation Modeling (SEM):** Cui (2021) and Wang et al. (2019) both employed large-scale survey data and structural equation modeling to test complex relationships. Cui (2021) modeled the impact of curriculum and teaching models on EM, using Entrepreneurial Climate as a moderator. Similarly, Wang et al. (2019) used quantitative modeling to assess the complementary effects of new versus traditional EE on competencies and intention.
- **Interpretivist Qualitative Research:** Wasim et al. (2023) adopted an interpretivist-constructivist approach involving **participant observation at co-working spaces** and **semi-structured interviews** with entrepreneurs. This qualitative methodology was essential for exploring the real-world gap between academic instruction and experiential learning from the perspective of practicing entrepreneurs.
- **Survey and Descriptive Analysis:** Zeng, Ye, Wang, Lee, and Yuan (2023) conducted a quantitative survey focused on a specific student cohort (Art and Design students) to identify their **learning needs** based on the Theory of Entrepreneurial Thought and Action.
- **Case Study and Descriptive Analysis:** Okuogume and Toledano (2024) used case studies of business-university educational partnerships to analyze the concept and practical implementation of co-creation in the context of Sustainable Entrepreneurship Education.

**Findings**

The collective findings underscore the critical role of context and pedagogical design in maximizing EE effectiveness:

- **Curriculum Design and Mindset: Cui (2021)** found that both the entrepreneurship curriculum and the teaching models used are significant predictors of students' **Entrepreneurial Mindset (EM)**. Crucially, this relationship is **moderated by the institutional Entrepreneurial Climate**, indicating that a supportive university environment amplifies the positive effect of the curriculum.
- **Complementary Pedagogies: Wang et al. (2019)** demonstrated that **new types of entrepreneurship education** (e.g., practical, experiential) effectively **complement traditional EE** in promoting both entrepreneurial competencies and intention. This suggests an optimal approach combines theoretical foundations with active practice.
- **Social Networks in Real-World Learning: Wasim et al. (2023)** highlighted a major divergence between academic and real-world learning, concluding that **social networks, context, and networking skills are vital learning mechanisms** for practicing entrepreneurs, elements often neglected in formal EE.

- **Co-Creation and Sustainability: Okuogume and Toledano (2024)** found that successful **co-creation** in Sustainable Entrepreneurship Education (SEE) requires a commitment from both the university and business partners to share knowledge and co-develop content, creating a mutually beneficial learning environment.
- **Tailored Needs: Zeng et al. (2023)** identified that students in non-business fields, such as Art and Design, have unique learning needs regarding EE, often requiring instruction tailored to their specific career paths and creative context.

**Research Gaps**

The literature points to several critical gaps, primarily concerning the integration of real-world practices and the contextualization of educational models:

- **Integrating Social Learning into Curricula:** As highlighted by **Wasim et al. (2023)**, there is a persistent **gap between the academic literature on EE and the practical reality of entrepreneurial learning (EL)**, which is heavily reliant on social networks and contextual knowledge. Future research must focus on developing and testing curriculum models that effectively incorporate these real-world social and contextual learning mechanisms.
- **Evaluating Specific Teaching Models and Climate Interaction:** While **Cui (2021)** identified that teaching models and institutional climate are predictive, more research is needed to disaggregate *which* specific teaching models are most effective under *which* particular institutional climate conditions.
- **Cross-Disciplinary EE Development:** Despite the acknowledgement of distinct learning needs for non-business majors like Art and Design (**Zeng et al., 2023**), there is a significant lack of standardized, validated, and published EE programs specifically tailored for creative, engineering, and humanities students. Research should focus on developing and evaluating these specialized curricula.
- **Measuring Sustainable Outcomes from Co-Creation:** The field needs more empirical studies to quantitatively measure the long-term impact of **Co-Creation** (Okuogume & Toledano, 2024) and SEE on actual student behavior and the sustainable performance of their resulting ventures.

**Mechanisms, Context, and Outcomes of Entrepreneurship Education**

- **Core Concepts and Conceptual Frameworks**

The effectiveness of Entrepreneurship Education (EE) in Higher Education Institutions (HEIs) is a primary focus across recent literature, with studies shifting from a simple correlation to an investigation of underlying mechanisms.

The central concepts explored are:

- **Entrepreneurial Intention (EI):** This is the most common dependent variable, representing a student's commitment to starting a new venture (**Zhang, Li, Zeng, Zhang, & Lu, 2022**; **Luu & Hoang, 2024**). It is a key metric for EE success.
- **Entrepreneurial Mindset (EM) and Alertness (EA):** EM is described as a fundamental psychological disposition, while EA is the specific ability to notice, identify, and evaluate opportunities. **Abdolvand, Ardestani, & Alizadeh (2024)** explicitly test EM as a mediator between EE and EA, positioning EM as a critical internal outcome that facilitates external alertness.
- **Contextual Variables and Learning Environment: Cui (2021)** introduces the concept of **Entrepreneurial Climate** at the institutional level as a moderator for EM development, suggesting that the university's overall support system is crucial. Similarly, **Ilonen (2021)** frames the **Entrepreneurial Learning Environment** as a self-regulatory, co-created setting, emphasizing the educator's role in creating this space. **Chen, Tang, & Han (2022)** further investigate the role of the **Diverse Learning Environment** in building competencies.
- **Social and Real-World Learning: Wasim, Youssef, Christodoulou, & Reinhardt (2024)**focus on **Entrepreneurial Learning (EL)**in practice, arguing that **Social Networks** and **Context** are vital learning mechanisms often overlooked by formal EE. **Hassan, Igel, & Shamsuddoha (2022)** formalize this by examining the **Entrepreneurial Social Network** as a mediator between EE and **Social Entrepreneurial Intention (SEI)**.

- **Pedagogical Modalities:** The literature differentiates between traditional theoretical instruction and experiential methods. **An & Xu (2021)** focus specifically on **Virtual Entrepreneurship Practice (VEP)** as a method to cultivate entrepreneurial talent, while **Boldureanu et al. (2020)** explore the use of **Successful Entrepreneurial Models** (i.e., role models) as a pedagogical tool.

**Methodology**

The studies predominantly rely on quantitative, cross-sectional survey research and advanced statistical modeling:

- **Structural Equation Modeling (SEM):** This is the core methodology across multiple studies to test complex theoretical models. **Abdolvand et al. (2024)** and **Hassan et al. (2022)** both used SEM to confirm the mediating roles of EM and Entrepreneurial Social Networks, respectively. SEM was also employed by **Luu & Hoang (2024)** to test the curvilinear (U-shaped) relationship of EE and the mediating role of Entrepreneurial Passion.
- **Meta-Analysis: Zhang et al. (2022)** conducted a meta-analysis, synthesizing the results of multiple prior studies to provide a robust, pooled estimate of the relationship between EE and EI, offering a high level of external validity.
- **Qualitative/Interpretivist Study: Wasim et al. (2024)** stand out by adopting an **interpretivist-constructivist approach**, utilizing **participant observation in co-working spaces**and **semi-structured interviews** with practicing entrepreneurs. This methodology provides rich, real-world context often missed by survey data.
- **Survey and Descriptive Analysis: An & Xu (2021)** and **Boldureanu et al. (2020)** utilized surveys to gather data on the perceived effectiveness of specific teaching methods, such as VEP and the use of role models, respectively.

**Findings**

Key findings across the body of work reveal a complex, conditional relationship between EE and entrepreneurial outcomes:

- **EE Works via Psychological States: Abdolvand et al. (2024)** found a strong positive effect of EE on both EM and EA. Crucially, EM was confirmed as a **significant mediator**, indicating that EE develops a receptive mindset first, which then enhances the ability to recognize opportunities (EA).
- **Curvilinear Relationship (U-Shaped): Luu & Hoang (2024)** provided a novel finding, demonstrating that the effect of EE on EI is **curvilinear (U-shaped)**. Initial exposure to EE may have a negligible or even slightly negative effect due to overconfidence or complexity, but the positive effect significantly increases only after achieving a critical mass of exposure. This relationship is mediated by **Entrepreneurial Passion** and moderated by **Resilience**.
- **The Power of Context and Educator: Cui (2021)** found that the positive impact of EE on EM is **moderated by Entrepreneurial Climate**. Similarly, **Ilonen (2021)** emphasized that educators are the primary architects of the **Entrepreneurial Learning Environment**, which requires adjustable co-creation and a 'grassroots' mindset.
- **Social Networks as a Critical Bridge: Hassan et al. (2022)** showed that the effect of EE on SEI is significantly mediated by the **Entrepreneurial Social Network**. This aligns with **Wasim et al. (2024)**, who empirically observed that real-world entrepreneurial learning is fundamentally driven by social networks, with **context and network** acting as essential learning mechanisms for practicing entrepreneurs.
- **Beyond Intention to Competence: Chen et al. (2022)** focused on **Entrepreneurial Competencies**, finding that both a diverse learning environment and effective knowledge transfer positively influence the development of these competencies.

**Research Gaps**

The synthesized literature highlights three major areas requiring further investigation to advance the field:

- **Longitudinal and Behavioral Studies:** The predominance of cross-sectional survey research (**Zhang et al., 2022**) means most findings demonstrate correlation or mediation, not causation. There is a need for more **longitudinal studies** that track students from initial EE exposure to actual entrepreneurial behavior (**Rauch & Hulsink, 2015**) to validate the long-term effectiveness of the proposed models (e.g., the U-shaped effect found by **Luu & Hoang, 2024**).
- **Bridging the Academic-Practice Divide:** Despite the qualitative evidence from **Wasim et al. (2024)** that real-world learning hinges on social networks and context, formal EE curricula lack standardized, evidence-based methods for simulating or integrating this social learning effectively. A gap remains in **developing and testing pedagogical models** that effectively translate "network learning" into scalable educational practice.
- **Refining Curricular Intensity and Timing:** The curvilinear effect identified by **Luu & Hoang (2024)** suggests that "more is not always better" initially, but a critical threshold is necessary. Future research needs to establish **optimal dosage and sequencing of EE content**—identifying the point where the initial discouraging effects subside and the positive effects of passion and resilience begin to dominate.

**Entrepreneurship Education Effectiveness, Mechanisms, and Context**

- **Core Concepts and Definitions**

The field of Entrepreneurship Education (EE) research has evolved from merely measuring outcomes to exploring the complex mechanisms of learning, competency development, and environmental context. **Entrepreneurship Education (EE)** is broadly defined as formal curricula designed to cultivate entrepreneurial spirit, competencies, and knowledge (Zhang et al., 2022). Key outcomes and mechanisms studied include:

- **Entrepreneurial Intention (EI) and Behavior (EB):**EI is the student's subjective willingness to engage in entrepreneurial activities, while EB represents the actual steps taken in venture creation (Rauch & Hulsink, 2015).
- **Entrepreneurial Mindset (EM) and Alertness (EA):**EM focuses on the cognitive skills and disposition for risk-taking and opportunity-seeking, which acts as a key mediator in the effect of EE (Cui, 2021; Abdolvand et al., 2024). EA, or the ability to identify potential opportunities, is directly influenced by EE and mediates the link to EM (Abdolvand et al., 2024).
- **Mediators and Moderators:** Key mechanisms linking EE to outcomes include **Opportunity Recognition** (Hou et al., 2022) and **Entrepreneurial Social Network** (Wasim et al., 2024). **Entrepreneurial Learning** (Hou et al., 2022), **Entrepreneurial Climate** (Cui, 2021), and **Resilience** (Luu & Hoang, 2024) are recognized as critical moderators that amplify or shape the primary EE-outcome relationship.

**Methodology**

Research on EE is characterized by a diverse methodological approach, offering robust insight across different levels of analysis:

- **Meta-Analysis and Synthesis: Zhang et al. (2022)** employed a rigorous meta-analytic approach, synthesizing findings from numerous empirical records to statistically confirm the generalized EE-EI relationship and test for contextual moderators, such as national setting.
- **Structural and Multilevel Modeling:** Studies frequently utilize **Structural Equation Modeling (SEM)**and **Multilevel Models** with large-scale survey data to test complex mediating and moderating relationships. **Hou et al. (2022)** specifically tested a multilevel model analyzing mediating (Opportunity Recognition) and moderating (Entrepreneurial Learning) effects simultaneously.
- **Longitudinal Designs:** Moving beyond mere intention, **Rauch and Hulsink (2015)** utilized a **longitudinal design** to track the impact of EE on students over time, providing essential evidence on the movement from intention to actual **Entrepreneurial Behavior (EB)**.
- **Qualitative and Interpretivist Inquiry: Wasim et al. (2024)** adopted an **interpretivist-constructivist approach**, employing participant observation and semi-structured interviews in co-working spaces to capture the nuanced, real-world gap between academic instruction and experiential learning from the perspective of practicing entrepreneurs.

**Findings**

The collective research strongly affirms the positive influence of EE while detailing the conditional and complex nature of this effect:

- **EE Positively Influences Intention and Mindset: Zhang et al. (2022)** confirmed a **positive association between EE and EI** across diverse samples. This effect is largely driven by EE's ability to foster **Entrepreneurial Mindset**(Cui, 2021) and **Alertness** (Abdolvand et al., 2024).
- **The Curvilinear Effect:** The relationship between EE and EI is not always linear. **Luu and Hoang (2024)**found a **U-shaped curvilinear relationship**, mediated by **Entrepreneurial Passion**. This suggests that moderate levels of EE might be more impactful than very low or potentially overly intensive engagement.
- **The Role of Mediators and Moderators**

  **Opportunity Recognition** is a confirmed mediator between EE and EI (Hou et al., 2022).

  **Entrepreneurial Learning** acts as a moderator, amplifying the positive effect of EE when students are more deeply engaged (Hou et al., 2022).

  **Entrepreneurial Climate** moderates the relationship between curriculum design and Entrepreneurial Mindset, showing that a supportive institutional environment is crucial for effectiveness (Cui, 2021).

  - **Intention to Behavior Link: Rauch and Hulsink (2015)** demonstrated that the impact of EE on actual **Entrepreneurial Behavior (EB)** is statistically significant, but the effect is strongest for students who already possess a high initial intention, suggesting EE functions as a facilitator for the committed rather than a primary motivator for the uncommitted.
  - **Contextual and Pedagogical Importance: Wasim et al. (2024)** identified that **social networks and contextual knowledge** are vital real-world learning mechanisms often disregarded in formal EE.

**Research Gaps**

The literature synthesizes several crucial areas requiring future investigation to enhance the efficacy of EE:

- **Bridging Intention to Behavior:** There is a persistent gap between the high intention promoted by EE and the relatively lower rates of actual **Entrepreneurial Behavior (EB)**(Rauch & Hulsink, 2015). Future research must identify and test the specific post-educational factors or sustained support systems that effectively translate EI into tangible venture creation.
- **Integrating Real-World Social Learning:** A significant divergence exists between academic literature and the practical reality of entrepreneurial learning, which is heavily reliant on **social networks and contextual knowledge** (Wasim et al., 2024). New curriculum models must be developed and evaluated that effectively integrate these real-world social learning mechanisms and experiential contexts.
- **Specificity and Contextualization of Pedagogy:** While the effectiveness of EE is context-dependent, more research is needed to disaggregate *which* specific teaching models are most effective under *which* particular institutional climate conditions (Cui, 2021).

**Conclusion**

This literature review underscores the evolution of research into entrepreneurship education (EE), confirming its positive, yet complex, influence on entrepreneurial outcomes within higher education. The synthesis of contemporary studies clearly demonstrates that the efficacy of EE is rarely direct. Instead, it is contingent upon mediating psychological states—such as Entrepreneurial Mindset, Perceived Behavioral Control, and Entrepreneurial Passion—which serve as the critical internal pathways that translate educational input into a willingness to act.

Furthermore, the review highlights that the impact of EE is fundamentally shaped by contextual factors and pedagogical design. Institutional elements, notably the Entrepreneurial Climate, operate as significant moderators, amplifying the success of curriculum design. Crucially, the literature advocates for a decisive move beyond traditional, knowledge-based instruction toward complementary, experiential learning models. These include virtual entrepreneurship practice (VEP), co-creation partnerships, and the

strategic integration of social network learning, all of which are vital for cultivating the soft skills and real-world competencies necessary for sustained venture creation. Despite these advances, the most prominent challenge remains the persistent gap between Entrepreneurial Intention (EI) and actual Entrepreneurial Behavior (EB). While EE is highly effective at increasing self-belief and willingness, its influence on tangible actions, particularly for uncommitted students, is comparatively modest.

Effective EE is an ecosystemic phenomenon, requiring tailored curricula that activate psychological mediators, are sensitive to contextual moderators, and prioritize authentic, action-based learning. Future research must urgently address the intention-to-behavior gap through more rigorous longitudinal studies and the development of standardized curricula that effectively embed real-world social and network-based learning mechanisms, ensuring that EE translates not only into a desire to start but the sustained capacity to succeed.

**Policy Recommendations:** Optimizing Conditional Effectiveness in Entrepreneurship Education

Based on the synthesis of academic literature focusing on the mechanisms, context, and outcomes of Entrepreneurship Education (EE) in Higher Education Institutions (HEIs), we provide the following recommendations. These suggestions are targeted at moving EE from merely boosting Entrepreneurial Intention (EI) to successfully generating Entrepreneurial Behavior (EB).

**Suggestions for Policy Makers**

Government bodies should focus on creating a supportive national and regional ecosystem that moderates (amplifies) the institutional efforts of HEIs.

- **Ecosystemic Alignment**

Mandate and Fund Regional Entrepreneurial Hubs. Create and financially support formalized regional hubs where HEIs, local businesses, and government agencies collaboratively offer mentorship, shared maker-spaces, and funding competitions.

The Entrepreneurial Climate is a critical moderator. Policy must ensure the "real world" context exists outside the classroom to give students authentic exposure and networking opportunities.

- **Bridging the EI-EB Gap**

Establish a National Graduate Startup Grant/Loan Program. Offer highly accessible, small-scale seed funding specifically conditional on the student actively engaging in the legal and financial steps of venture launch (EB).

Direct financial support helps overcome the initial high-risk hurdle, translating psychological readiness (EI) into tangible action (EB).

- **Teacher Training & Standards**

Invest in Faculty Development Focused on Experiential Methods. Offer subsidized, mandatory training for EE faculty on action-based pedagogies, such as Virtual Entrepreneurship Practice (VEP), design thinking, and co-creation methods.

Traditional, theory-based EE is conditionally ineffective. Governments must ensure faculty are equipped to deliver the high-impact, experiential content necessary to build Perceived Behavioral Control (PBC).

- **Data & Accountability**

Implement a National EE Outcome Tracking System. Require all publicly funded HEIs to report longitudinal data tracking student EI, program participation, and actual venture creation/survival rates three to five years post-graduation.

Essential for accountability. Allows policy to assess Conditional Effectiveness based on actual EB, not just short-term EI metrics.

**HEI**

- HEIs must take ownership of their role by designing curriculum and fostering an institutional environment that activates the necessary psychological mechanisms in their students. Integrate Action-Based, Interdisciplinary Projects. Replace purely theoretical coursework with mandatory, semester-long projects that require students from different faculties (e.g., engineering, arts, business) to collaboratively launch or prototype a real product or service. This pedagogy is vital for activating Entrepreneurial Mindset and building PBC by forcing students to deal with real-world complexity and failure.

- **Activating Mechanisms**

Formalize and Assess Psychological Outcomes. Implement pre- and post-course assessments measuring changes in Entrepreneurial Passion, Mindset, and PBC, making these metrics an essential part of program evaluation, not just student feedback. Effectiveness is conditional on mediators. HEIs must focus curriculum design explicitly on shaping these internal psychological states, which are the engine for EI.

- **Enhancing Context**

Establish an Official "Failure Friendly" Climate. Create formal mechanisms (e.g., small grants that don't need to be repaid, dedicated "learn from failure" workshops, and faculty who celebrate lessons from failed student ventures) to de-stigmatize failure. A supportive Entrepreneurial Climate is the most powerful moderator. Reducing the social cost of failure encourages students to take the real-world risks required for EB.

- **Faculty Incentives**

Reward Experiential Teaching and Industry Engagement. Adjust promotion and tenure criteria to heavily weight faculty involvement in practical mentoring, company incubation, and successful student ventures, rather than relying solely on traditional research publications. Incentivizes faculty to move away from theoretical lectures and engage in the high-effort, community-based, and network-focused teaching that is conditionally required for maximum EE effectiveness.

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