



MBA Graduates' Perceptions of MVP-Based Physical Startup Simulation in Entrepreneurship Education: Evidence from Nepal

Prem Nath Gaire¹ , Min Prasad Dawadi² , Rishi Ram Chapagai³ ,
Bharat Ram Dhungana⁴ 

Abstract

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Purpose: *Entrepreneurship education is shifting from traditional teacher-centered pedagogies toward learner-centered approaches, including simulations even in least-developed countries like Nepal. However, the impact of physical startup simulations remains underexplored in the scholarly literature. This study intends to examine MBA students' perceptions of minimum viable product (MVP) based physical startup simulation to uncover its impact on their entrepreneurial learning and its role in developing key entrepreneurial competencies.*

Methods: *This phenomenological study employed unstructured interviews to explore the lived experiences and perceptions of participants selected through purposive sampling. Accordingly, 11 MBA students were interviewed from four academic institutions in the Bagmati Province of Nepal to ensure provincial representation and data saturation. The sample size was considered adequate considering the sampling criteria presented by Creswell (1998). The data were transcribed and translated into English for subsequent thematic analysis using Braun and Clarke's (2006) six-phase framework, with a focus on depth of insight.*

Results: *The empirical findings generated four major themes: pedagogical innovation, startup management skills, startup risk management, and feedback-based learning and motivation. These themes align with Kolb's experiential learning theory and Ries's lean startup theory. Based on these themes, we propose a novel physical startup simulation model that holds practical relevance for entrepreneurship educators in developing entrepreneurial competencies among students.*

Conclusion: *Compared with software-based digital simulation, the MVP-based physical startup simulation can be more effective, logistically simpler, and more economical for teaching entrepreneurship, particularly in the context of the least developed countries.*

Keywords: Entrepreneurship education, experiential learning, lean startup, minimum viable product (MVP), simulation

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I. Introduction

Entrepreneurship Education (EE) is expected to impart entrepreneurial knowledge and skills, aiming to develop entrepreneurial competencies as reflected in entrepreneurial intentions

¹Boston International College, Pokhara University, Bharatpur, Nepal

²Boston International College, Pokhara University, Bharatpur, Nepal

³Quest International College, Pokhara University, Lalitpur, Nepal,

⁴School of Business, Pokhara University, Pokhara, Nepal

and behaviors (Seyedi et al., 2021; Rodrigues, 2023). Traditional transactive pedagogies involve lecture-based models (Kutzhanova et al., 2009) that convey knowledge in a unidirectional manner; however, conventional pedagogies contribute little to the development of entrepreneurial competency (Chaker & Jarraya, 2021). Although lectures are still widely used (Seyedi et al., 2021), newer approaches have demonstrated greater effectiveness than lectures for developing students' self-awareness, interpersonal skills, and problem-solving skills (Papademetriou & Anastasiadou, 2025). These pedagogical innovations include real-world business projects, case studies, sharing entrepreneurs' experiences, the use of simulation software, action-oriented activities, and problem or project-driven methods (Bell & Bell, 2020). The use of digital technologies, such as gamification and 3D virtual reality (Rodrigues, 2023), has contributed to further pedagogical enrichment. Rodrigues further suggests that EE pedagogy is shifting from traditional knowledge-transfer models towards experiential learner-centered approaches.

Simulation technique, which attempts to mimic realistic scenarios, has been popular among entrepreneurship educators for its ability to immerse students in complex business situations (Papademetriou & Anastasiadou, 2025). Simulation-based entrepreneurship teaching can be an effective way to convey complex concepts and the practicalities of the startup formation process. This is because simulation techniques embody the experiential learning cycle proposed by Kolb (1984) where students can experience, reflect, conceptualize, and experiment on the concepts taught to them. Software-based simulations are highly popular in academia; however, simulations can also be conducted physically. Although physical simulation-based techniques are used in practice, academic research has yet to fully explore and understand them (Yasin et al., 2022). Moreover, while software-based simulations are widely studied, physical simulations, which require educators' creativity and imagination, are not adequately captured in the existing literature. Moreover, the lean startup theory has emerged as an extensively practiced, and more suitable theory to apply the physical startup simulation technique in classroom contexts. The minimum viable product (MVP), a component of the lean startup theory that is based on rapid testing of product feasibility, has been popularized by Ries (2011). The lean startup theory, in general, and the MVP concept, in particular, are both new concepts with limited theoretical and empirical foundations (Stevenson et al., 2024), warranting further examination. To add to this, the current literature predominantly focuses on the Western context (Anderson et al., 2017; Dennehy et al., 2019; Bocken & Snihur, 2020; Felin et al., 2020), leaving the simulation practices in the developing and least developed contexts unexplored.

However, physical startup simulation and the MVP concept are both relevant for least developed countries' (LDC) context. Firstly, the lack of financial resources hinders the adoption of digital simulation, particularly in purchasing the software and licences. Secondly, the weak internet infrastructure impedes the deployment of such tools. Thirdly, using such software requires special training for teachers and students which puts an additional financial burden to the students. MVP-based concept is highly relevant because it forces students to creatively come up with low-cost prototypes of products which makes them highly suited for resource constrained environments. Therefore, in this context, this paper aims to explore: RQ1) How does the physical startup simulation using the minimum viable product (MVP) influence entrepreneurial learning among students? RQ2) What role does physical startup simulation play in developing entrepreneurial competencies among students? This study aims to answer these questions by qualitatively interviewing 11 MBA students, following Creswell's (1998) guideline for sampling phenomenological research. Bagmati province, Nepal is chosen for study as it represents the resource-constrained context of LDCs.

The aforementioned research questions are important because entrepreneurial innovation and startup development are linked to economic development and employment generation (Leković & Berber, 2019; Kritikos, 2024) and have been a critical concern for policymakers, academic institutions, and the private sector worldwide (Pellegrini & Johnson-Sheehan, 2020). Thus, identifying effective pedagogies for teaching entrepreneurship is critical for

all concerned stakeholders (Motta & Galina, 2022) where students benefit from enhanced learning; academia benefits from the greater efficacy of pedagogy; and the government and private sector can anticipate increased entrepreneurial activity. The study contributes to entrepreneurship education by introducing a MVP-based physical startup simulation model that is suitable for teaching entrepreneurship in resource-constrained contexts. Additionally, it contributes by enriching the literature of MVP and the lean startup theory.

II. Reviews

Entrepreneurship Education

Entrepreneurship education (EE) was introduced in 1947 by Myles Mace at Harvard Business School (Gabrielsson et al., 2023; Simba et al., 2025). Ever since, the discipline has spread globally with over two-thirds of US universities now offering entrepreneurship programs (Bauman & Lucy, 2021). The strategic focus on entrepreneurship by the reputed institutions such as Babson College, MIT, and the Kauffman Foundation, combined with the surge of technology-driven startups, helped popularize and support the growth of entrepreneurship education (Wasdani et al., 2022; Cunningham et al., 2024). As a result, EE is shaping both the developed (Bell & Bell, 2020; Rodrigues, 2023) and developing economies (Dhliwayo, 2008; Simba et al., 2025) by catalyzing innovation, commercialization, and global economic progress (Zotov et al., 2021).

Following global trends, most Nepalese universities offer entrepreneurship courses at both undergraduate and graduate levels (Thapaliya et al., 2024; Subedi & Bhandari, 2024). Beyond management faculty, entrepreneurship is also gaining interest in engineering (Shrestha et al., 2024), agriculture (Regmi & Naharki, 2020), and even in community based training and courses (Bhandari et al., 2021). Additionally, scholars have proposed interesting theories such as the effectuation theory, lean startup theory (Ries, 2011), and concepts like business model canvas, brand canvas, design thinking and rapid prototyping, minimum viable product (MVP) and so forth (Nabi et al., 2017). These theories and concepts are providing new, action-oriented approaches for entrepreneurs that mandate pedagogical changes to fully encapsulate the learning. However, pedagogical approaches remain highly traditional, and still rely largely on lecture based models, particularly in the LDCs context such as Nepal.

Experiential Learning and Simulation in EE

Traditional pedagogy has primarily been transactive in approach, whereby knowledge is transferred from instructors to the students in a unidirectional way (Kutzhanova et al., 2009; Seyedi et al., 2021). Although useful and significant, the lecture method is inadequate to teach the complex and practical course of entrepreneurship, which, in the words of Drucker, is "*neither art nor science but a practice*". The departure in pedagogical improvements can be marked by the work of Lewin, Piaget, and Dewey, and later consolidated by Kolb's (1984) experiential learning theory (Novaes, 2024). Experiential learning is grounded in the constructivist paradigm (Bell & Bell, 2020), in which knowledge is acquired through direct experience of a phenomenon or process. However, neither experiential learning theory (Kolb, 1984) nor its application in EE constitutes a recent phenomenon. Developed countries such as the United Kingdom and developing countries such as South Africa (Dhliwayo, 2008) have implemented these techniques for almost two decades.

The literature on experiential learning in EE offers pedagogical tools for instructors ranging from mere observation to active experimentation (Novaes, 2024). For instance, Zotov et al. (2021) examined case method teaching to empirically conclude that the intervention group received favorable treatment in the industry, when compared with the control group. Similarly, scholars have analyzed experiential approaches, such as real-world business projects, case method, entrepreneurs' speeches, simulation software, group work (Dhliwayo, 2008), action-oriented, problem-driven, and project-based approaches (Bell & Bell, 2020). Additionally, emerging concepts such as design thinking and gamification methods, supported by three-dimensional Virtual Reality (VR) tools, have been assessed (Rodrigues, 2023). These

empirical studies confirm that experiential methods are better than traditional lectures at cultivating an entrepreneurial mindset, building adaptability and resilience, and enhancing students' ability to recognize startup opportunities (Bell & Bell, 2020). Nonetheless, LDCs' contexts such as Nepal lagged behind in adopting such approaches thus impacting the efficacy of entrepreneurial education.

Simulation that mimics specific actions, such as establishing and managing startup ventures (Bell & Loon, 2015; Nabi et al., 2017); market testing products and services with actual buyers (Ries, 2011); and so forth might present a suitable pedagogy for LDC's context. While software-based simulation is well-studied in academic literature (Faisal et al., 2022; Vecchiarini et al., 2024; Ahuja, 2024), physical (non-digital) simulation, surprisingly, remains understudied, although it could be more viable in resource-constrained environments. Digital simulation is costly; it requires special training for the instructors (Heyworth-Thomas, 2023); and its complexities often deter students from active engagement (Rogmans & Abaza, 2019). Furthermore, the interaction between human beings is moderated by the software system, even when physical interaction might be more convenient or desirable. On the contrary, physical simulation is likely to be cost-effective, adaptable to topics and contexts, deployable through basic training to teachers, and more importantly, capable to foster human-to-human interaction, thus supporting digital detoxification (Marciano et al., 2024; Ansari et al., 2024). However, existing studies have not fully explored how physical simulation influences the learning of students and whether it supports skill development in the context of EE.

Lean Startup Theory and the Concept of Minimum Viable Product

EE has adopted practitioner-generated theories and methodologies such as lean startup and design thinking, owing to their emphasis on rapid, iterative, and action-oriented approaches (Ries, 2011; Shepherd & Gruber, 2021; Blank & Eckhardt, 2024). Lean startup is the theory for validating a new business model through rapid prototyping and iterations. This theory has become highly popular among startup founders (Shepherd & Gruber, 2021), although established corporations such as 3M and General Electric have also applied it successfully to innovate new products (Dennehy et al., 2019; Scheuenstuhl et al., 2021). The essence of this theory is to minimize the time and resources required to develop a product so that market validation can be achieved before significant time and monetary investment (Abdulaziz, 2024), typically through a minimum viable product (MVP).

MVP is one of the five building blocks of the lean startup framework (Shepherd & Gruber, 2021). It can be defined as the simplest version of a product that enables entrepreneurs to gather validated customer insights with minimal effort (Ries, 2011; Dennehy et al., 2019; Bocken & Snihur, 2020). Although it is widely practiced, MVP lacks an academic foundation (Stevenson et al., 2024), and most scholarly work on MVP appears to be based on grey literature. Some academic articles were found in the literature; however, most were conceptual papers, with only a few empirical studies. MVPs can be based on digital prototypes, including 3D drawings (Umbreen et al., 2022), which suffice for digital startups; however, physical products can also be developed for market testing startup ideas in non-IT sectors. This study focuses on physical MVPs because business students typically generate physical products.

Although the academic foundation of MVP is weak, a few empirical studies have examined its application. In the study conducted at Texuna, a UK-based software company, MVP development using the lean-startup methodology was examined, however, it yielded inconclusive results (Dennehy et al., 2019). This was mainly because of its application in a corporate context where employees were new to this concept. Another study found that MVP helped in iteration of product cycles to attain better product-market fit; however, it cautioned against too frequent iterations (Anderson et al., 2017). Bocken and Snihur (2020) and Felin et al. (2020), however, critique the lean startup theory and the MVP concept, arguing that they over-rely on customer feedback. They argue that the customers may not necessarily have better knowledge than the founders. Therefore, a knowledge gap exists to effectively understand whether an MVP concept can be useful in startups' context. Furthermore,

combining the MVP concept with simulation-based pedagogy appears to be complementary for entrepreneurial education because building MVPs permit students to test their startup-related assumptions, learn from failure in a low-stakes environment, and refine their product offerings through continuous feedback (Bocken & Snihur, 2020). However, such synthesis is missing in the existing literature.

Theoretical Underpinning

The curriculum and pedagogical evolution have quickly globalized, and thus experiential methods such as startup simulations (Bell & Loon, 2015) and MVP testing (Ries, 2011) have become central to teaching entrepreneurship even in the least developed economies like Nepal (Subedi & Bhandari, 2024). Although challenges with such approaches exist, including logistical complexity and resource intensity, particularly pressing in less resourceful academic settings, such as Nepal, the educators have nonetheless implemented MVP based physical startup simulation in a frugal manner, particularly in the Bagmati Province of Nepal. This study collects the perceptions of the MBA students from four different academic institutions to understand how such pedagogical approach influenced their entrepreneurial learning.

This study combines experiential learning theory, constructivist learning theory, and lean startup theory in the context of EE. Experiential learning theory, proposed by Kolb (1984) provides us a lens to interpret four steps to learning: act, reflect, conceptualize, and apply (Novaes, 2024), and constructivist learning theory (Chuang, 2021; Marougkas et al., 2023) explains how live customer interaction and feedback can help co-create (or construct) knowledge that supports startup founders in identifying and solving their early-stage problems (Bell & Loon, 2015). Similarly, the lean startup theory proposes several intuitive concepts, including MVP that provides the context for both pedagogy and entrepreneurship. The student's conception, creation, testing, and iteration of an MVP can be effectively linked with validated learning constructs in the lean startup theory (Ries, 2011), alongside experiential learning and constructivism. Taken together, these three theories will provide a robust lens to analyze the findings of this study.

III. Methodology

Research Design

This study adopted a phenomenological research design among the qualitative research methodologies. The research uses an exploratory approach to conduct unstructured interviews to elicit participants' feedback on the MVP-based physical startup simulation. Thematic analysis was conducted according to Braun and Clarke's (2006) six-phase framework, focusing on depth of insight over generalizability. This approach allowed an inductive coding and pattern identification process without any prior preconceptions. The study aligns with the principles of constructivist epistemology, wherein knowledge is co-constructed through participants' lived experiences (Denzin, 2017).

Data Collection

The unstructured interview questions were used to collect participants' experiences and their entrepreneurial learning by applying a purposive sampling technique. Four institutions where the MVP-based simulation pedagogy was applied were chosen to make the study representative of the Bagmati province of Nepal. The institutions and participants were chosen purposively that allowed researchers to collect data from each institution until data saturation was attained, which usually occurred after interviewing two to three participants. This study adheres to the criteria presented by Creswell (1998) and Morse (1994) who recommend the sample size in the range of five to twenty-five for phenomenological research. Accordingly, the data was collected from 11 MBA students. Their responses were video recorded on a mobile phone, transcribed, and translated from Nepali to English for thematic analysis. Due consideration was given to retain their original message to objectively assess their learning (Creswell & Poth, 2018). The responses were anonymized before thematic analysis to reduce

researcher bias (Birt et al., 2016) by numbering the participants from P₁ to P₁₁. The same numbering is used to quote participants in the findings section, along with their gender (For example, [P₁, M]). The participants' demographic profile has been presented in Table 1, followed by a descriptive account of their background.

Table 1

Demographic Profile of Participants

Age Group	Male [M]	Female [F]	Total
21 - 25	5	2	7
26 - 30	2	1	3
36 - 40	1	0	1
Total	8	3	11

All the participants were MBA students who studied the Entrepreneurship and Innovation subject. They came from different professional backgrounds, with some students having their own startups, some students having a family business, and a few were in regular employment. The majority of them were full-time students. The participants were a mix of diverse ethnicities, income classes, age group, and other demographic factors.

Data Analysis/Meaning Making

This study thoroughly followed the six phase framework (Braun & Clarke, 2006) of thematic analysis. Firstly, the researchers familiarized with the data through thorough and repeated reading. Secondly, the inductive approach and descriptive coding techniques (Miles et al., 2020) was used to generate initial first-order codes. Thirdly, the researchers looked for patterns to generate higher order sub-themes and themes. Subsequently, the themes and sub-themes were revised, merged, and removed for redundancy through an iterative process. A total of 27 unique codes were finalized, which were grouped into 9 sub-themes and four themes that were defined in light of the research problem. Finally, the report was written to capture the depth of insights over generalizability, particularly due to the qualitative nature of the study.

Credibility and Confirmability

We conducted respondent validation to confirm the accuracy of the transcription and translation (Birt et al., 2016). We have given due consideration to remain as objective as possible during the entire thematic analysis process. We have provided a thick description of the research methods and findings to enhance the study's credibility and confirmability in other contexts. We have presented key findings in the form of codes and subthemes for each theme to ensure transparency and trustworthiness of the results. However, despite our efforts, we acknowledge that some researchers' bias might have influenced our analysis particularly because of the qualitative nature of our study.

IV. Results and Discussion

Results

The study findings, generated from the iterative coding process, are presented in the form of themes, subthemes, codes, and direct quotes. Given the inductive process, the refined codes were grouped together into higher order subthemes and themes. However, this process in itself was highly iterative and based on the judgment of the researchers.

Table 2*Themes and Subthemes*

Themes	Subthemes
Pedagogical innovation	Theory and practice integration Novel learning Fun learning
Startup management skills	Startup strategy and execution skills Market validation/Market feasibility
Startup risk management	Identifying and managing uncertainty/risks Compliance risks
Feedback-based learning and motivation	Customer feedback Motivation and encouragements

The study resulted in four major themes from the inductive thematic analysis process as highlighted in table 2 that directly address the research questions. The themes pedagogical innovation, and feedback-based learning and motivation directly address RQ1, whereas the themes startup management skills and startup risk management address RQ2 alongside supporting RQ1.

Pedagogical Innovation

According to the participants, the physical startup simulation model was a novel pedagogical tool that helped bridge the gap between theory and practice. The participants were accustomed to the theoretical model of learning, and found this approach in direct contrast to that model. Therefore, they felt that this model helped integrate theory and practice, uncover novel insights, and made learning a fun and enjoyable process (see Table 3), thus implying that their entrepreneurial learning was enhanced (RQ₁). It also further enhanced their learning experience as it allowed students to act on their ideas, reflect on their experiences, conceptualize new knowledge, and apply the new knowledge in future scenarios, thus following experiential learning theory (Kolb, 1984).

We were familiar with the topics previously, however it was theoretical. We knew the content theoretically. But we converted that [knowledge] into reality, and [thus] it became really effective. [P₁₀, M]

The overall session was helpful to acquire practical knowledge. [P₉, M]

The participants reinforced this theory and practice divide by citing that at some point, they lacked confidence about how to execute, even when they had a clear concept in their mind. Nonetheless, the participants were able to derive novel learning during the event that helped build their confidence.

We engaged in brainstorming after brainstorming on this idea. Despite all that, when it was time to create MVP to execute the idea, we were confused about what to do. We were like, now what [should we do] next.. how [to proceed ahead]... Translating the idea and concept into application was difficult. [P₇, M]

When we delivered the [Powerpoint] presentation we thought that our idea cannot be executed. We had that kind of gut feeling. [P₂, F]

Table 3*Subthemes and Codes of 'Pedagogical Innovation' Main Theme*

Subthemes	Codes
Theory and Practice Integration	Convert theory into action Theoretical knowledge and practice gap Lack of confidence
Novel Learning	Learnt new insights Unanticipated feedback revealing new insights Deep learning/Effective learning Realistic experience
Fun Learning	Enjoyable process Fun learning

The simulation revealed unanticipated novel insights that led participants to rethink their initial assumptions and startup idea. For instance, participants came to know that regulatory approval and compliance issues must be addressed prior to launching their startup ventures.

We did not know that we cannot sell paracetamol [illegal to sell medicines without acquiring regulatory approval] by packaging with other items since we do not come from a medical background. We got that knowledge. [P₂, F]

The simulation also deepened participants' learning by expanding the depth and breadth of their ideas, however, in a fun learning environment. The participants thus ascribed the event as a realistic experience and an enjoyable process.

It was quite fun. We felt like we actually went to the market to sell our products. We felt like we learnt deeply about our own concepts. It was a very nice experience. We got to learn a lot. [P₂, F]

This theme answers RQ1 on how this model influences entrepreneurial learning among students. Participants described the model as a shift from abstract, lecture-based learning toward an applied, experiential mode in which they had to "convert theory into action." Some participants noted that they had previously understood concepts theoretically but lacked confidence in execution, however, this model helped them translate ideas into action thus enhancing learning at a deeper level. This process also generated novel insights which forced participants to reframe their assumptions about startup feasibility. This model immersed students into the role of an entrepreneur to derive entrepreneurial learning adhering with Kolb's (1984) framework, thus, making this pedagogical approach more effective.

Startup Management Skills

Building on the previous theme, this theme answers the research question (RQ₂) on how the simulation supports the development of entrepreneurial competencies, particularly in the early stages of startup management. Participants' experiences highlighted several key skills: strategy and execution, market validation, inventory management, and order and sales management (see Table 4). Through direct customer interaction, participants refined their perception of market opportunity and adjusted their strategy such as target market, location, or products based on real-time feedback. Therefore, these experiences also align with Kolb's experiential framework enhancing learning (RQ₁).

Table 4*Subthemes and Codes of 'Startup Management Skills' Main Theme*

Subthemes	Codes
Startup strategy and execution	Strategy management query
	Strategy explanation
	Perception of market opportunity and feasibility
	Inventory management skills
Market validation/Market feasibility	Sales of the products
	Appreciation of the startup concept
	Request for additional information
	Order booking for future sales

Customer interaction influenced the strategy, execution, and feasibility of the products and services. Customer inquiry made the teams conscious about their strategy, including their target market, location, or financing modality. It also helped them sense the market opportunities within the scope of their startup ideas.

The audience who visited us directly asked us about the target market. All the visitors inquired where the outlet is or when we will open the [physical] outlet. [P₆, M]

One of the attendees was so convinced by our idea that she thought we had a real business and she asked for our location and our business card. [P₄, M]

She was inquiring about whether she can invest [in our startup] and asked what kind of research needs to be done, if she were to start a similar business. [P₅, F]

Some participants doubted the feasibility of their idea; however, their perception changed when their products attracted significant customer interest. Some participants, initially unaware of compliance requirements, discovered that their products were unfeasible in their current capacity. This was because their products and services fell under regulated industries/sectors such as selling medicine, or manufacturing cleaning chemicals. Thus, this event helped students to better understand their product's feasibility.

In the context of Nepal, the concept of frozen meat was novel. ... They liked our idea and they suggested that the hygiene should be maintained. [P₈, M]

We didn't know it was illegal to sell phenyl products without details like 'Expiry Date'. One young student shared it with us. [P₄, M]

The execution of ideas is equally or even more important than the idea itself. The students learnt the importance of inventory management, need for further research about customer demands, and market validation strategies.

Also, we should have more stock to sell as all stocks were sold. [P₆, M]

We bought a few samples from the local market for today's purpose. [P₇, M]

We also received feedback that if we could make the food package feasible to microwave, it would be better. [Thus] We learnt that we need more research on our side. [P₆, M]

The participants were able to validate their startup ideas, in the form of direct product sales, confirmation or booking for future sales, enthusiasm expressed through inquiries, and other encouraging statements.

We received the assurance that if they have any work [related to advertisement creation] they will contact us. [P₁₁, M]

... another observer came to us and announced that if we register our business he will be our first customer. [P₄, M]

The customers were impressed with our service given the context of COVID and they also purchased our kits. [P₂, F]

Everyone praised our concept. The audience gave suggestions for further improvement, including the teachers. [P₃, F]

The physical startup simulation broadly supported developing startup management skills to operate early stage startups among students, thus helping them build entrepreneurial competency (RQ₂). By changing the student's perceptions about their products' feasibility, this model forced students to move beyond the novelty of their idea to implementation feasibility including legal compliance. Moreover, this model helped students understand the core concepts related to startup and entrepreneurship such as strategies, feasibility testing, sales, execution, and so forth, positively influencing their learning (RQ₁).

Startup Risk Management

This theme also addresses both research questions by enhancing students' understanding of risks, uncertainties, and unknowns (RQ₁) and developing skills supportive to startup risk management (RQ₂). Although startups face a significant amount of uncertainty and risks, we cannot teach students the full essence of these risks. Physical startup simulation seems to enable students to experience and appreciate these risk factors (See Table 5) themselves, thus building understanding as well as resilience.

Table 5

Subthemes and Codes of 'Startup Risk Management' Main Theme

Subthemes	Codes
Identifying and managing uncertainty/risks	Unanticipated feedback
	Packaging issues and importance
	Confusion about how to execute/Lack of confidence
	Unpredictable customer demands/Market uncertainty
	Embracing uncertainty
Compliance Risks	Compliance requirement of certain industries

Uncertainty or risk was revealed in the form of unanticipated feedback in product or service offerings. The participants noted that the customer pointed out newer areas for improvement that were completely unanticipated. Such unanticipated feedback was received in compliance concerns, packaging issues, market demand estimation, and inventory management.

We received unanticipated feedback. We didn't know it was illegal to sell phenyl products without details like 'Expiry Date'. One young student shared it with us. [P₄, M]

We also received feedback that if we could make the food package feasible to microwave, it would be better. [P₆, M]

One participant noted that their knowledge was strengthened by encountering uncertainty. Accepting such uncertainties helped them remain resilient to tackle such challenges.

Translating the idea/concept into application was difficult. We noted that the way of getting things done was different. Because of the confusion, we felt that our knowledge was sharpened. For example, we were only focusing on delivering healthy food and had ignored the packaging part. [P7, M]

Identifying, understanding, and accepting risks inherent in the entrepreneurial journey is important to remain resilient and motivated in their entrepreneurial journey. As students experienced different types of challenges, they understood these challenges more deeply, and also developed risk management abilities, thus addressing both research questions.

Feedback-Based Learning and Motivation

The participants repeatedly mentioned receiving feedback as an important advantage of physical startup simulation to enhance learning. The positive and constructive real-time feedback motivated and encouraged participants in pursuing their startup ideas (see Table 6). The interplay between constructive and motivational feedback suggests that the simulation creates a dual learning effect: it sharpens product and service quality while sustaining participants' engagement and perceived self-efficacy. Feedback serves not only as a pedagogical tool but also as a driver of both cognitive and affective dimensions of entrepreneurial learning (RQ1).

In the idea that we were working on, we got real-time feedback from [the] customers. The positive and constructive feedback that we received increased our motivation and energy. [P7, M]

Table 6

Subthemes and Codes of 'Feedback-Based Learning and Motivation' Main Theme

Subthemes	Codes
Customer Feedback	Positive Feedback
	Real-time Feedback
	Constructive feedback
Motivation and encouragements	Customer Enthusiasm
	Developed confidence
	Motivating comments and encouragements

The feedback, as noted by participants, was instrumental in identifying what mattered the most to the customers. Some participants observed that the simulation provided an opportunity to understand different perspectives of different types of customers.

What feedback they provided was, ... we were focusing on hygiene majorly; if we could come up with a signature product in the market by maintaining hygiene, it would help us expand, sustain, and capture the market share. [P8, M]

This event allowed us to see the same activity through multiple perspectives. [P1, M]

The positive feedback that the participants received encouraged the participants to continue their startup ideas. Usually, constructive feedback, positive feedback, and encouraging remarks were observed simultaneously. The audience had something they liked in the product, whereas they also saw some areas for further improvement.

... [We not only] received feedback, but also got encouragement. [P₁₁, M]

We received feedback also. Everyone praised our concept. The audience gave suggestions for further improvement, including the teachers. [P₃, F]

Thus, real-time customer interactions emerged as a critical learning mechanism drawing both constructive and positive feedback that helped refine product offerings, meet compliance requirements, and improve the packaging. Many of these customer-generated insights were unanticipated by the students, but they successfully unearthed several gaps in the products and services offered by students. Despite facing confusing scenarios, the students enjoyed the learning experience provided by the physical startup simulation method (RQ₁).

Discussion

Traditional pedagogy, such as lecture, fails to connect the students with the lived experience of entrepreneurs. The MVP-based physical startup simulation fills this pedagogical gap by creating an experimental environment for students where students are encouraged to rapidly test their ideas in the market as prescribed by the lean startup theory (Bocken and Snihur, 2020). This activity-oriented pedagogy allows students to experience the life of an entrepreneur and the challenges faced by them such as market uncertainty, demand volatility, and ambiguity (Smirnov et al., 2023), thus strengthening the connection between theory and entrepreneurial reality. This activity, then represents a pedagogical innovation, that integrates experiential learning theory, constructivist learning theory, and lean startup theories.

MVP application is not always linked to successful outcomes. In an empirical study by Dennehy et al. (2019) based in Ireland, five MVPs created by an Edtech Research Center, a joint venture between Texuna and University College Cork, yielded unsatisfactory and mixed results, largely due to a misunderstanding of the MVP concept, work-culture differences, and the application of MVP within an existing company context. In contrast, our findings show that the majority of students enjoyed the MVP-creation process likely because they understood the concept and the experimental nature of MVPs, suggesting that context and purpose matter. Similarly, customer validation of the founder's idea is paramount in entrepreneurial undertakings (Silva et al., 2020; Sanasi et al., 2023). Collecting customer feedback to understand whether customers have an unmet need/demand for a product is conceptualized in the lean startup theory as validated learning (Ries, 2011). This evidence enables founders to gauge the market potential of the products and services before investing money fully (Abdulaziz, 2024) and strengthen founder's motivation and persistence, particularly when the product is well received (Ryan & Deci, 2000). Our findings resonate with these studies because students who obtained real-time feedback refined their offerings, adjusted their assumptions, and felt more confident in their ideas. Therefore, startup simulation helps build both knowledge and skills relevant for early startup management in terms of strategy, execution, and market validation of startup ideas.

Embracing and navigating uncertainty is a regular part of the entrepreneurial journey (Hota et al. 2024; Gómez, 2025). Sarasvathy (2001), in her seminal work on effectuation theory, proposed that founders should anticipate uncertainties and leverage them (turn 'lemon into lemonade'). The whole idea of lean startup theory is to traverse the unknown; therefore, start small or lean (Ries, 2011). A few studies have thus suggested a 'learning by doing' principle, particularly in the emerging economies context (Smirnov et al., 2023) to understand real world entrepreneurial challenges. Therefore, facing such uncertainties themselves, the participants of this study experienced risk management in the entrepreneurial context, which enhanced their entrepreneurial competencies.

Although lean startup theory emphasizes rapid iteration and experimentation (Ries, 2011), our findings reveal that compliance, licensing, and operational realities can sometimes make products unfeasible even when customer validation is positive. This reveals an important limitation of the lean startup theory, that undermines the legal, regulatory, and institutional factors that are critical in least developed countries such as Nepal. Some students realized,

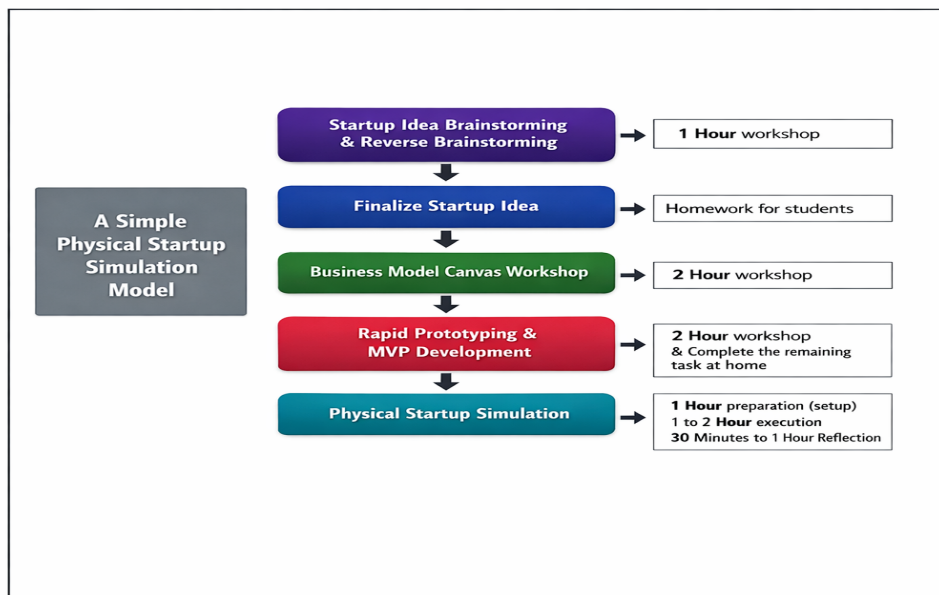
for example, that packaging design, expiry-date labeling, and sector-specific regulations could render otherwise promising products non-viable. Felin et al. (2020) critique the MVP concept, arguing that customers' knowledge is limited to serve any useful purpose to entrepreneurs. This study does not fully validate their critique. While a single customer may not have more knowledge than the founders, the cumulative knowledge of multiple customers can help founders to identify overlooked gaps regarding marketing, packaging, supply chain, compliance, and so forth. Thus, we can conclude that this setup supports obtaining 'maximum learning with minimum resources' (Ries, 2011; Anderson et al., 2017), which provides both feedback and motivation to entrepreneurs.

Even a physical workshop model of pedagogy allows for feedback collection; however, such feedback is limited to the perspective of the instructor and the peers. Physical simulation, on the other hand, draws feedback from a more diverse audience including instructors, peers, and other potential customers coming from different backgrounds, thus bringing in heterogeneous perspectives and thoughts that is simply not possible in a traditional classroom setup. The feedback-driven learning makes physical simulation-based pedagogy grounded in experiential learning, and constructivist learning theory.

Overall, our study findings indicate a positive perception among students regarding the physical startup simulation which proved useful in teaching students to view problems through multiple perspectives. It essentially helped students immerse themselves in the life of an entrepreneur and deepen their understanding of entrepreneurship concepts. This answers our first research question that the physical startup simulation using the minimum viable product (MVP) positively influences entrepreneurial learning among students. Similarly, by uncovering a real entrepreneurial environment, this pedagogy helped students develop entrepreneurial competencies such as translating ideas into action, validating their products in the market, managing the startups, navigating uncertainties, utilising feedback to refine their products, and so forth. The startup simulation pedagogy is capable of turning students into real-world entrepreneurs ready with their products to sell in the marketplace. Therefore, we argue that this pedagogy supports developing entrepreneurial competencies among students, and this answers our second research question. Based on these findings, we propose a Physical Startup Simulation Model that provides guidance on how to conduct the simulation.

Physical Startup Simulation Model

Conducting the physical startup simulation requires a systematic approach to planning and execution. We propose an executable plan for an 8-hour time period, where we initially need to conduct a startup idea brainstorming session to allow students, in a group of 4 to 5 students, to come up with novel ideas. This 1-hour workshop can utilize a combination of techniques, such as brainstorming, reverse brainstorming, SCAMPER (Substitute, Combine, Adapt, Modify, Put to another use, Eliminate, and Reverse or Rearrange) (Boonpracha, 2023), and so on. The students will have generated multiple ideas by now, which then needs to be narrowed down to one startup idea for execution, which can be a homework assignment. The business model canvas workshop should be planned next. Its objective is to expand the startup idea into 9 frameworks. The third workshop will comprise a rapid prototyping and MVP development exercise with the objective to enable students to develop a tangible product or service. Students are required to complete the unfinished task as homework after the workshop.

Figure 1*MVP-Based Physical Startup Simulation Model*

The final session that involves execution of the simulation needs to be planned for public participation, either indoors or outdoors, such that the event gets a footfall of potential customers. Students will be provided a table, as in the expo, which they will decorate and host their products in a presentable way, and this setup will take approximately 1 hour. Afterwards, the simulation begins, and students engage with customers, peers, and instructors to validate their products or services and collect feedback. While the objective is to collect feedback, the students do so by selling their products, as MVP is a selling concept. Finally, the students pack up their stalls after the designated time (1 to 2 hours) and will engage in a reflective discussion to debrief their learnings.

This physical startup simulation model is important for a few reasons. Advanced technologies such as virtual reality (VR) and augmented reality (AR) have been shown effective to teach complex concepts among students (Marougkas et al., 2023). While such technologies seem exciting and futuristic, their widespread use requires further development, whereas our model is ready to implement. Secondly, physical simulations requiring physical activity might have added significance for digital detoxification and overcome the limitations of digital simulation (Rogmans & Abaza, 2019; Heyworth-Thomas, 2023). Digital devices may still be used such that the simulation combines both digital and physical activities.

Theoretical Contribution

This study makes a significant contribution to the existing literature on EE. Firstly, we propose a novel MVP-based physical startup simulation model (see Figure 1) that entrepreneurship educators can use to complement their pedagogical approach. Existing theoretical and empirical studies are predominantly based on software-based simulation (Faisal et al., 2022; Chen et al., 2023; Vecchiarini et al., 2024; Ahuja, 2024) where they have highlighted limitations such as high cost and technical complexities (Rogmans & Abaza, 2019; Heyworth-Thomas, 2023). Some of the limitations of digital simulation including cost, can be addressed by our model that makes simulation pedagogy accessible in resource-constrained contexts, such as

the least developed countries (LDCs). Secondly, the findings of this study corroborate those of several studies that simulation-based pedagogy is more effective than traditional pedagogy (Salamzadeh et al., 2022) and thus provide literature support from the LDC context. We found that students perceived MVP-based pedagogy as a more effective teaching approach (Motta & Galina, 2022). Thirdly, our study expands the literature on the MVP concept, which remains under-studied (Stevenson et al., 2024). Our study proposes the MVP concept, not just as a subset of lean startup theory, but also as an essential pedagogical tool in its own right for EE. Finally, while experiential methods are widely perceived as more engaging than traditional lectures, few studies have investigated physical simulation in the EE context. Our investigation of physical (non-software) simulation pedagogy for teaching is, therefore, an important contribution to literature.

V. Conclusion and Implications

This study not only supports the existing literature on experiential learning theory and lean startup theory, but also extends their application in the least developed countries' context. It proposes a novel physical startup simulation model that uses the MVP concept to teach entrepreneurship in general, and the lean startup theory in particular, to students in business schools. This pedagogy, as highlighted by this study, positively supports entrepreneurial education and also helps students develop several competencies related to entrepreneurship. It does so by enabling students to experience the uncertainties, trade-offs, and challenging decision-making scenarios associated with enterprising. As the global scenario becomes more volatile, unpredictable, and complex, the importance of entrepreneurship as a tool to embrace such uncertainties in decision-making surges. In that context, a physical startup simulation model might emerge as an entrepreneurship or management laboratory, where experiments can be conducted to explore, understand, and mitigate some of these uncertainties.

The findings of this study yield three critical implications for the practice of entrepreneurship education. Firstly, educators can incorporate the 'physical startup simulation model' to teach key entrepreneurship concepts, such as the MVP, lean startup, and effectuation theory, thereby institutionalizing experimentation and a data-backed approach in entrepreneurial decision-making. Secondly, the educators should be trained in experiential pedagogies, such as physical simulation. Physical simulation seems to be highly customizable to the objectives of the instructors and the resources available to them. This can expand the benefit of simulation pedagogy to a greater number of students. Thirdly, experiential pedagogies such as simulation place learners in the shoes of their study subjects, which might be equally effective in other disciplines beyond entrepreneurship.

Limitations and Future Directions

This study is not without limitations. Firstly, the small sample size (N=11) and unique LDC context limits the generalizability of its findings. Secondly, despite our conscious efforts, the study and its interpretative analysis are subject to the researchers' subjectivity (Creswell & Poth, 2018). Thirdly, the existing research in the field of lean startup, minimum viable product (MVP), and physical simulation as a tool for experiential pedagogy is still in its early phase, thus limiting our discussion. Although widely practiced, the research on non-software-based simulations, which we term 'physical simulation,' is strikingly low in the context of EE. Such pedagogy has the potential to support experiential learning in resource-constrained settings as shown by our research and, more importantly, to serve as a helpful digital detoxification strategy in academic settings (Marciano et al., 2024; Ansari et al., 2024), given that digital tools have taken on an unprecedented role in modern education. Thus, further research can enrich the emerging literature in this field, by including larger samples, conducting longitudinal research to track longer-term impacts of such pedagogy, and exploring participants' new venture creation rates in their actual career.

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