

Rethinking Entrepreneurship Education in Polytechnics: A Qualitative Study of Entrepreneurial Skill Acquisition and Utilisation in the Indian Context

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ABSTRACT:

Entrepreneurship education is being seen as a key tool to combat youth unemployment and encourage innovation. Its impact, however, in polytechnic settings has not been studied extensively, especially regarding its usefulness in transferring acquired skills into entrepreneurial practice. This study aims to examine the key factors influencing entrepreneurship education in polytechnic institutions and to explain the transition from entrepreneurial skill acquisition to skill utilisation, aligning with industry expectations in the Indian context. This study uses a qualitative research design based on data from three focus group discussions (FGDs) and 18 in-depth interviews with purposively sampled policymakers, faculty members, and industry experts. The data were analysed using systematic thematic coding in Atlas.ti software. The results show that entrepreneurial skill development is a product of environmental, cognitive, and behavioural factors, such as passion, perseverance, creativity, and resilience. The study also points to a significant difference between the acquisition (learning) and application (utilisation) phases, suggesting a gap between learning and application. Innovative practices, such as the introduction of co-working spaces and early mentoring, contribute to skill development; however, the effective use of these skills is linked to the adoption of industry practices, such as artificial intelligence (AI) and sustainable, “nature-positive” practices. This study contributes to the literature by adding a process dimension of entrepreneurial skill acquisition to utilisation within Social Cognitive Career Theory (SCCT). The study's multi-stakeholder approach in the polytechnic setting offers practical insights for designing experiential entrepreneurship education in an industry context to improve real-life entrepreneurial outcomes.

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1. Introduction

Amid rapid technological and economic changes, India faces a significant challenge in closing skill gaps and addressing workforce mismatches. The India Skill Reports for 2023 and 2024 have raised

concerns about skills and entrepreneurship awareness (Wheebox, 2024; Jena, 2020). The World Economic Forum's 2023 report highlighted a shift in skill requirements due to evolving environmental, technological, and economic trends. To prepare for these changes

and effectively leverage India's demographic dividend, while ensuring equitable growth, urgent structural reforms are necessary (Wheebox, 2024; Oyedepo, 2024; Gupta & Dharap, 2024).

The evolution of entrepreneurship education is anything but static; it is a dynamic tapestry woven from the insights of educators, policy makers, and industry leaders. Central to these discussions is an urgent question: How do we prepare the next generation not just to survive, but to thrive in an entrepreneurial world that is as unpredictable as it is promising? This question is not new, but the spotlight on it has never been brighter.

Vocational programs at polytechnics provide a practical solution by aligning with the industry and focusing on equipping students with the skills necessary for current and future industries. Developing entrepreneurship skills through vocational programs is a crucial tool for generating employment (Gupta & Dharap, 2024). Most research to date focuses on entrepreneurial intention and skill development and provides limited knowledge of the process of transforming entrepreneurial skills into entrepreneurial behaviour and practical use (Duong & Vu, 2024; Vamvaka et al., 2020; Muhammad Amsal et al., 2014)

Entrepreneurship education is delivered in polytechnics through its regular programs. However, its structure and depth vary with institutional capacity, their existing industry linkages, infrastructure availability, and faculty expertise (Chhabra et al., 2021; Gupta & Dharap, 2024). While policy initiatives like NEP 2020 foster experiential learning and industry-oriented learning, the education of entrepreneurship in polytechnics is being imparted in various ways like classroom training, workshops, internships, industrial visits, and project-based learning (Endow & Dhote, 2024; Vats & Malik, 2024; Parvanda, 2022; Mack et al., 2019). Previous research has indicated that entrepreneurial learning is not only affected by the curriculum content, but also by the experiential exposure and the institutional environment and interaction with the industry, all of which influence the development of entrepreneurial competencies,

self-efficacy and entrepreneurial behaviour among learners (Bora & Barthwal, 2025; Motta & Galina, 2023; Taneja et al., 2025; Nabi et al., 2017; Fayolle & Gailly, 2015). Although significant efforts have been made in entrepreneurship education research, notable gaps remain in the literature. Existing research has mostly been conducted in university-based settings, and polytechnic institutions have received little attention, particularly in developing countries such as India (Chhabra et al., 2021; Galvão et al., 2018). There are some research efforts that have focused on entrepreneurship in vocational education; however, they are still somewhat scattered and limited in depth (Alias et al., 2021; Lindner, 2020).

Then, there is a relative paucity of empirical work that takes a multi-stakeholder view of entrepreneurial learning ecosystems and incorporates the voices of faculty, industry stakeholders, and policymakers. Current research primarily examines students' outcomes, and few studies consider institutional and ecosystem factors that influence students' entrepreneurial skill development (Pennetta et al., 2024; Hussain et al., 2024).

To address the gaps, this study examines the process of entrepreneurial skill development and utilisation in polytechnic contexts from a qualitative and stakeholder perspective. The work is situated in the interface of entrepreneurship education, vocational training and behaviour theory, as it introduces a process-based definition of entrepreneurial development, rather than expecting the development of an intention, by focusing on the process of going from skills acquisition to skills application.

Literature Review

Entrepreneurship education could be necessity-based or opportunity-based (Fairlie & Fossen, 2020). Establishing a small set-up for need-based entrepreneurship education does not require a very high degree of input. However, opportunity-based entrepreneurship education requires a thorough understanding of all the aspects of business, product, financial planning, sales, branding, and promotion. This concept

encompasses two phases of the learning process: one is about mindset-building, the other about skillset-building (Ferreira-Neto et al., 2023; Jiatong et al., 2021; Lindner, 2020; Pennetta et al., 2024; Wang et al., 2021). The former is more challenging, especially in the Indian context, and the researchers identified this as one of the gaps to be addressed (Bora & Barthwal, 2024; Alkaabi & Senghore, 2024).

Lindner (2020) defined entrepreneurial learning as the process of enhancing learners' skills and mindset, to enable them to transform a creative idea into entrepreneurial action. Institutions develop this by engaging internal and external stakeholders, creating a fertile environment for students to learn skills, such as creative thinking, decision-making, opportunity recognition, and the iterative process of trial and error as a habit (Lindner, 2020). Every section of the stakeholders comes with its own perceptions and understanding of the current situation and resolution to handle demand-supply mismatch and the quality of the training (Malik & Venkatraman, 2017; Ministry of Skill Development and Entrepreneurship, 01-18; Okolie et al., 2020).

Skill-based training is short-term and can very well be handled by polytechnics. However, polytechnics in India have been reported to suffer from problems like a lack of preparedness of teachers, and a lack of optimal resources for the students (Alias, et al., 2021). In their work, McGrath et al. (2022) and Chhabra et al. (2021) highlighted the need for new concepts and theories to address industrial issues in developing economies. Chhabra et al. (2021) and Fonseca et al. (2024) strongly supported the need for qualitative studies exploring complex, context-specific phenomena such as entrepreneurship education systems and stakeholder perceptions. Despite numerous government initiatives such as Atal Tinkering Labs, 'Start-Up India, Stand Up India', the inception of the Entrepreneurship Development Institute of India (EDII), and the Small Industrial Development Bank of India's (SIDBI's) 'Udyami Mitra' portal to provide financial assistance during the last decade (2010–

2020), India has not shown the expected growth in its entrepreneurship base (Chhabra, et al., 2021). Therefore, an in-depth examination is necessary into the reasons for the ineffectiveness of the process of acquiring entrepreneurial skills and utilising them. Social Cognitive Career Theory (SCCT) has been used to explore different factors; it also identifies a research gap related to understanding supportive ecosystems, and their role in building entrepreneurial capabilities of students receiving entrepreneurship education, in vocational education and training environments (Kayan-Fadlilmula, et al., 2022).

The effectiveness of the training process can be analysed by assessing the factors influencing skill acquisition of entrepreneurial education and factors affecting the entrepreneurial utilisation process. The environment of entrepreneurial training can broadly be defined as internal and external factors. Not only must the pedagogy focus on the capacity building of a student, but also on creating a culture of entrepreneurship in society (Alias, et al., 2021). Belief is influenced by one's environment (Sahban, et al., 2014).

The measure of the effectiveness of the training is related to intention, which in turn is defined by motivation and alertness towards the opportunity. Its variation can be attributed to the difference in students' experience of the past, present, and perceptions of the future, and can be gained through affective and cognitive mechanisms (Levasseur, et al., 2024).

Therefore, the research question is:

How can vocational education at polytechnics in India be redesigned to integrate real-world entrepreneurial experiences and effectively foster entrepreneurial behaviour among students?

Theoretical framework

The prediction of desirable behaviour of students is a crucial aspect of this study and can be best understood by studying their current behaviour through a deductive approach. This research derives its explanation from the Social Cognitive Career Theory (SCCT), which is based on three constructs: self-efficacy, outcome expectation, and

intention. These factors have a moderating effect on students' learning experience, goal setting, and outcome behaviour. Entrepreneurial Self-Efficacy (ESE) refers to a student's belief in their ability to perform tasks associated with starting a business (Kassean, et al., 2015). Vital entrepreneurial training positively influences ESE (Levasseur, et al., 2024). The second concept, Entrepreneurial Intention (EI), is the core of the SCCT. Observational learning and role models significantly impact one's intentions. Research shows that students who attend entrepreneurship education have higher intentions of starting a

venture (Galvão & et.al., 2018).

According to Duong & Xuan (2024), ESE has a partially positive mediating influence between entrepreneurial education and EI. The third construct, Entrepreneurial Outcome Expectations (EOE), refers to one's expectation that a particular action will lead to a desirable result. Social recognition, self-directed goals, and pride of achievement strengthen this aspect (Kassean et al., 2015).

Based on the above theory, we propose the following framework for this study.

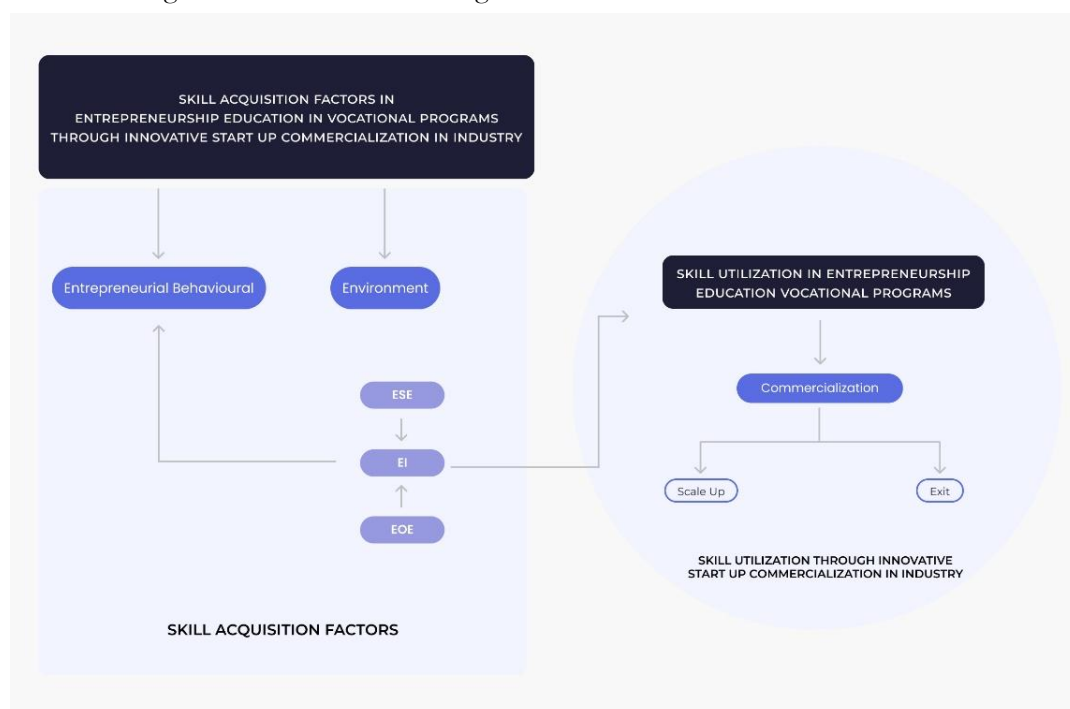


Figure I: Research framework proposed by the authors, inspired from Kassean, et.al., 2015

From the standpoint of Social Cognitive Career Theory (SCCT), the right learning environments play a significant role in shaping individual behaviour. This can be done by mastery experiences, observational learning, and social persuasion (Bandura, 1997). Exposure to entrepreneurial ecosystems, industry interactions, internships, incubation activities, and practical engagement improves the students' confidence in their entrepreneurial capabilities, thereby increasing the likelihood of translating entrepreneurial intention into actual behaviour. In this context, entrepreneurial self-efficacy becomes a crucial mediating factor between

educational experiences and entrepreneurial outcomes.

Empirical studies also suggest that the effectiveness of entrepreneurship education depends largely on how students engage with experiential activities, especially in a socially embedded learning process. Fayolle and Gailly (2015) observed that entrepreneurship education can significantly influence entrepreneurial attitudes, intentions, and behaviours when learning experiences are designed to foster active participation and practical exposure. Therefore, entrepreneurial behaviour among students can be better understood as an outcome of dynamic

interactions between individual cognition, learning experiences, and the broader educational environment.

This study builds on Social Cognitive Career Theory (SCCT) and adds a process perspective on entrepreneurial learning, represented as a transition from skill acquisition to skill utilisation. In addition to self-efficacy and outcome expectations, as well as environmental influences, the traditional explanation of career-related behaviour in terms of SCCT does not explicitly differentiate between phases of competence development and its translation into behaviour. This study fills this gap by showing that the evolution of entrepreneurial behaviour happens in two steps: the first one is the evolution of entrepreneurial skills (acquisition phase) and the second one is the evolution of applying entrepreneurial skills in real life (utilisation phase) which are influenced by different factors, but interrelated.

Given the existing applications of SCCT in entrepreneurship education, which are mainly concerned with predicting entrepreneurial intention, this research aims to shift the focus to behavioural enactment in a vocational context, specifically at a polytechnic. The results emphasise a lack of automaticity between intention and action, and the presence of factors related to skill use, such as contextual barriers or opportunities for application. The conceptual leap from static versions of SCCT to a dynamic, stage-based understanding represents a new direction in the development of SCCT.

2. Methodology

The study uses purposive sampling, selecting key informants directly involved in entrepreneurship education at polytechnic institutions, such as faculty members, industry experts, and academic & industry policymakers. We determined the number of samples by the principle of information richness, which aligns with the qualitative research design. We chose participants to represent a mix of views and experiences relevant to the development of entrepreneurial skills in vocational contexts. In

this context, qualitative inquiry is suitable for exploring and understanding stakeholders' perceptions of complex learning processes and contextual influences in the vocational environment (Chhabra et al., 2021; Fonseca et al., 2024). Additionally, it identified perceptual differences of opinion regarding the essential factors influencing students' training and learning process among three crucial stakeholders in entrepreneurial skill development: policymakers, faculty, and industry experts. Studying the disparities and commonalities in their perceived factors of effective training enabled us to suggest better strategic elements.

Policymakers included people holding leadership positions in higher education institutions and governing bodies. In contrast, the faculty group included members actively training students for entrepreneurial skill development in polytechnics and higher education institutions, while industry experts were people with experience in running start-ups.

We collected the data through three focus group discussions (FGDs) and eighteen in-depth interviews from all three stakeholder groups: industry experts, policy makers and faculty members. We obtained the ethical committee certification (registration no. EC/NEW/INST/2022/2820) for this. Then, we did a systematic content analysis of the collected data, coded and interpreted with the help of Atlas.ti (Fonseca, et al., 2024). Thematic analysis was used to systematically process the collected data and identify patterns and relationships among factors that impact entrepreneurial learning. The analysis was based on a structured coding process of three stages:

Open Coding: We created the initial codes by identifying recurring patterns in issues related to skill set and mindset construction, both during skill learning and during use.

To capture the key dimensions of entrepreneurial learning (Pennetta et al., 2024; Chhabra et al., 2021), related codes were combined to form broader categories, a process

referred to as Axial Coding.

Selective Coding: We developed the core themes to explain how these factors interact to create entrepreneurial behaviour, specifically from learning (skill acquisition) to applying (skill utilisation). Such an analytical approach is consistent with Social Cognitive Career Theory (Bandura, 1997; Lent & Brown, 1996), which focuses on the interaction between personal and environmental factors that affect behavioural outcomes.

We also added rigour to the analysis by identifying themes based on frequency and/or salience in stakeholder responses, and by checking interpretations against responses from other participant groups.

Finally, we drew the result from the identified themes of the theoretical framework. The interpretation was done through tabular output

of the shortlisted factors, and comparative tables to analyse the similarities and differences in stakeholders' opinions. The shortlisting criteria for factor selection were set at a frequency of five or more.

3. Finding and Discussion

Based on the proposed framework, this section offers a theme-wise representation of the factors involved in achieving a comprehensive outcome to enhance the effectiveness of entrepreneurial programs in polytechnic programs.

3.1 Current and future requirements for effective entrepreneurship skill development in vocational programs

Table I shows the distribution of the thematically aligned identified factors. The researchers established this distribution at the research level and provided an analytical summary based on the identified themes.

Table I: Thematic representation of the factors quoted

Factors	THEMES (SKILL ACQUISITION)				SKILL UTILIZATION FACTORS
	MINDSET FACTORS	SKILLSET FACTORS	ENVIRONMENTAL FACTORS	BARRIERS	
01	Ideas	Customer research	Technology Intervention	Lack of business knowledge	Exposure
02	Passion	Experience	Industry Mentor	Fear of failure	Networking
03	Perseverance	Risk taking	Family	Lack of financial knowledge	Industry ready
04	Creativity	Skillset	Curriculum	Lack of faculty specialisation	Commercialisation scaleup
05	Attitude	Financial Knowledge	Investor	Lack of attention span	Industry mentor
06	Adaptability & Flexibility	Opportunity recognition	Government	Lack of awareness	
07	Innovation	Communication skill	Incubation		
08	Change	Confidence	Industry		
09		Experimentation	Faculty		
10		Problem Solving	Internship		
11		Business knowledge	Classroom Projects		
12		Design Thinking	Nurtured		
13		Discipline	Soft Skills Training		
14			Encouragement		
15			Case Study		
16			Alumni		
17			Marketing		
18			Collaboration		
19			Innovation		
20			Masterclass		
21			Brainstorming		
22			Sustainability		
23			Culture		
24			Social Media Marketing		

3.1.1 Skill acquisition factors

The proposed framework for evaluating entrepreneurship training effectiveness is structured at two key levels. The first is the skill acquisition phase, which examines the impact of the training on both the mindset and skillset of students during their educational journey. The second is the skill utilisation phase, which explores how these students practically apply their acquired skills within the industry.

The foundation of the first phase is drawn from the SCCT, emphasising ESE as a central behavioural component. This theory suggests that effective entrepreneurship training fosters positive behavioural shifts, motivating students to pursue entrepreneurship confidently as a viable career path.

To achieve this, training programs must go beyond simply imparting technical skills; they should also cultivate an entrepreneurial mindset. This dual focus—developing practical competencies while nurturing a proactive, resilient mindset—enables students not just to learn but to internalise entrepreneurial principles, positioning them for success in real-world applications.

Table I shows that the qualitative data analysis revealed ten factors mentioned by all three stakeholders: adaptability and flexibility, attitude, courage, creativity, ideas, innovation, motivation, passion, perseverance, and self-reliance. These ten factors were the main focus of the discussion out of the eighteen mindset factors.

Based on the strength and frequency of occurrence, the ability to generate ideas is the most critical indicator of a positive entrepreneurial mindset. This essentially means that students have the aptitude to create ideas and recognise opportunities (Alkaabi & Senghore, 2024). Some quotes extracted from the in-depth interviews are provided below:

‘They intrinsically have the ability to put their finger on the pulse of what will work.’ (Faculty 1, in-depth interview)

‘People and ideas drive this person.’ (Faculty 2, in-depth interview)

The second most frequently discussed indicator of an entrepreneurial mindset was passion, defined as a deep-seated desire for an activity that holds personal significance and drives an individual to dedicate time and energy to it (Hussain et al., 2024). Research has shown that passion strongly mediates the relationship between entrepreneurial training and career commitment, reinforcing a student’s dedication to pursuing entrepreneurship (Hussain et al., 2024).

Perseverance emerged as the third most significant mindset factor, characterised by a steadfast commitment to a chosen path, even in the face of obstacles. Perseverance embodies the continuous effort and the drive to remain motivated despite challenges. Notably, there is evidence of a positive link between entrepreneurial education and perseverance, particularly in the practical execution of business ideas (Joshi et al., 2024).

Creativity was another critical component emphasised by participants. Shumetie and Mihret (2020) argue that creativity in entrepreneurship is influenced by motivational, contextual, cognitive, and social factors. This finding suggests that tailored training programs that bolster student motivation, expand their knowledge base, and promote innovative thinking can effectively enhance creativity (Shumetie & Mihret, 2020; Bengtsson, 2014).

Attitude was also highlighted as a crucial element. Existing theories in entrepreneurship indicate that entrepreneurial behaviour is largely planned and intentional, developing over time rather than emerging spontaneously (Vamvaka et al., 2020). This intentionality suggests that educational strategies should focus on nurturing a positive, proactive attitude that progressively shapes entrepreneurial intentions.

Other qualities that surfaced in discussions included adaptability and flexibility, which are essential for navigating dynamic markets; courage, the willingness to take calculated risks;

motivation, the inner drive propelling action; and innovation, the ability to create value through novel solutions.

Factors as indicators of skillset

The term 'skills' refers to the competence, capability, and proficiency of a person to do something (Pennetta, et al., 2024). Pennetta et al. (2024) established that entrepreneurial skills can be acquired experientially and culturally; it is a discipline that can be learned. On many occasions during our interviews, stakeholders claimed that acquiring an entrepreneurial skillset is possible to achieve with the proper training.

'Skillset is very easy to learn compared to mindset, because mindset needs to be developed and it takes time. As far as skillset is concerned, it can be developed through right training' (Expert 1, in-depth interview)

As shown in Table 1 the following are the essential factors of skillset:

Research and opportunity recognition were widely considered the most critical factors in the interview discussions and were explored in various contexts. It became evident that research plays a pivotal role in every step of the entrepreneurial journey. Emphasising the need for robust primary research to gain valuable insights and make well-informed decisions was a recurring sentiment.

'Business research has become essential. You have to research. It cannot be like a copy mode.' (Faculty 4, in-depth interview)

'I think a lot of emphasis should be placed on primary research and field research. I think only that it makes you a stronger person.' (Faculty 3, in-depth interview)

Experience is related to activities that closely resemble real-life situations, conducted in the classroom to provide a simulated experience. Teaching methodologies related to experiential learning work better in providing practical exposure to students. With these methods, participation is higher, allowing students to gain more clarity about critical concepts that would otherwise be difficult to grasp through

traditional lecture methods (Chhabra, et al., 2021).

Risk-taking ability (Bengtsson, 2014; Rajalakshmi, et al., 2024), or the inability of youth to take risks, was widely discussed among the three stakeholders.

'(One of) the very basic qualities anybody should possess to become an entrepreneur is to have the risk-taking appetite, because becoming an entrepreneur involves an element of risk and that risk-taking appetite makes an individual start their journey of becoming an entrepreneur.' (Expert 2, in-depth interview)

'They should have an appetite for risk, calculated risk-taking.' (Policy maker 4, Focus Group)

'...Risk-taking abilities are very important.' (Faculty 4, Focus Group)

Financial Knowledge and having a strong grasp of concepts is crucial for a successful entrepreneurial venture. Neglecting this aspect can result in long-term failure. Even with a great product and high demand, poor financial management can lead to underperformance and eventual decline. Therefore, it's essential to develop a robust financial acumen (Alias, et al., 2021; Olaniran & Mncube, 2018). Almost all respondents emphasised the need to build students' financial acumen through training and structured inputs.

'It's been three to four years since they have been doing this, but without any good returns. So, these poor returns are because they are not able to manage their finances.' (Faculty 7, in-depth interview)

Communication is widely regarded as one of the most crucial skills, but the India Skilling Report 2024 states that refined communication skills are actually the most important transferable skill. These skills can be more challenging to master compared to other occupational skills. The respondents unanimously highlighted the critical need for strong communication skills, backed by compelling success stories (Wheebox, 2024; Shrotriya & Dhir, 2018; Bengtsson, 2014). Some

of the most thought-provoking quotes often arise during in-depth and focused group discussions.

‘Communication is key in this. It’s that pitching of the idea that really makes something fly, and that is more so now because you’re going to be looking at people who will put in money.’ (Faculty 1, in-depth interview)

Aside from the factors mentioned above, other important factors include problem-solving (Bengtsson, 2014; Chou et al., 2010), experimentation, confidence, design thinking, business knowledge (Chou et al., 2010), and data analysis. The literature indicates that all of these skills should be integrated into the curriculum through hands-on experiential activities to equip students with a comprehensive skillset.

Environmental factors

Table I highlights a multitude of environmental factors in entrepreneurship education in India, particularly in vocational training and education. Environment proved to be very significant and is a basic determinant influencing the formation of entrepreneurship and confidence in the application of entrepreneurship. The overt focus on learning contexts by both faculty and experts has indicated that learning contexts are important for enabling or constraining skill acquisition.

Technological intervention: The focal point of most discussions was technology. Most of the participants highlighted the potential of digital platforms and e-learning tools to expand access to entrepreneurship education. They stressed the imperative to integrate technology into vocational training programs from the outset, across all facets of the curriculum, to ensure students acquire the essential skills for success in the contemporary business landscape. Effective use of social media has a positive impact on the profitability, communication, and sustainability of business (Butenko et al., 2023; Zu Ermgassen et al., 2022). In the field of technology, several subtopics were discussed, including AI, machine learning, sustainability, social media marketing, and prototyping. According to Awal and

Chowdhury (2024), understanding AI is linked to positive entrepreneurial behavior due to its low operational costs. However, an expert also noted that it is virtually impossible to keep up with the rapid evolution of technology in the industry. Therefore, being aware of these developments and incorporating more frequent updates into the curriculum will certainly help improve the situation.

‘We are living in such great times that to make something or to sell something, it doesn’t cost any real amount of money. The greatest tool in retail today is online or social media marketing, and to create a page or an identity or a product and be able to get it out there costs zero money.’ (Expert 4, in-depth interview).

‘You need to be using technology at your disposal and not letting technology use you.’ (Expert 6, in-depth interview)

‘I do not think that academics has really kept pace with industry when it comes to technology.’ (Negative sentiment expressed by Faculty 2, in-depth interview)

According to almost all the interviewees, family environment and culture are the first factors that influence a student’s entrepreneurial behavior. Students from business families have a significant advantage in terms of exposure and learning compared to those without any business background. These students witness the challenges and successes of the business firsthand and often seek to contribute to their family’s business or explore new opportunities, drawing on their acquired knowledge and experience in business (Hill, et al., 2023).

‘If they are born into a business family, they are actually talking about business at home...people from those kinds of families are already conditioned before they come to college; they have an upper hand.’ (Expert 3, in-depth interview)

‘I wanted to do my own this thing, so I tried with whatever little understanding I had, because I come from a very service-class family. I didn’t have any mentoring at home on how to

run a business; it was mostly driven by my sense of intuition. (Expert 4, in-depth interview)

Then, access to financial resources and networks is crucial for aspiring entrepreneurs. Vocational training programs in India are increasingly trying to provide these resources through partnerships with industries, financial institutions, and entrepreneurship development cells. But this is cited as one of the biggest challenges for them too. The concept of a fully functional and effective incubation system is the need of the hour—it is a critical requirement for the sustained growth of entrepreneurs at all levels.

Other than the above, active engagement with the industry through masterclasses, projects, internships, case studies, and brainstorming were some of the points discussed.

Barriers

The reported barriers to effective skill acquisition, especially in polytechnic education environments, were most commonly linked to a lack of business knowledge. Many experts highlighted students' lack of this skill and their inability to realise its importance at the beginning of their entrepreneurial journey. Most entrepreneurship students become overly focused on their product and its perceived potential, neglecting thorough long-term planning. As a result, they may achieve short-term success, but soon encounter issues due to poor managerial decisions. Fear of failure was the next most discussed factor. According to Duong and Xuan (2024), fear of failure negatively influences the ESE and EI. The next most highlighted barrier was a lack of financial knowledge, which often led to the failure of the organization, even if they had the best products

and market demand for them (Olaniran & Mncube, 2018). Faculty availability and specialisation also emerged as areas of concern. The effectiveness of even the best-designed training programs suffers due to the lack of trained faculty with the right skills and industrial experience to guide students through the critical nuances of entrepreneurship. Then, the lack of awareness of entrepreneurial potential and the short attention span of students were also cited as barriers to effective entrepreneurial training.

3.1.2 Factors as indicators of skill utilisation and commercialisation

Skill utilisation factors influence students' performance when applying learned concepts. The highest frequency was for the exposure the student received during the training and after the course from the institution, as well as from other sources such as the government, industry mentors, the incubation cell, etc. Then, networking with other stakeholders such as investors, suppliers, banks, clients, and complementary service providers emerged as the next most influential factor. Industry mentor and industry readiness are also essential for the venture's long-term success. Interviewees also emphasised the importance of planning for scaling up and a successful exit, using exclamations such as 'of course', 'definitely', and 'certainly'. They pointed out that entrepreneurs' shortsightedness is a leading cause of failure for even the best products and services. Scenario planning for scaling up or exiting not only benefits the long-term prospects of the business, but also instils confidence in students, better preparing them to face challenges and take calculated risks.

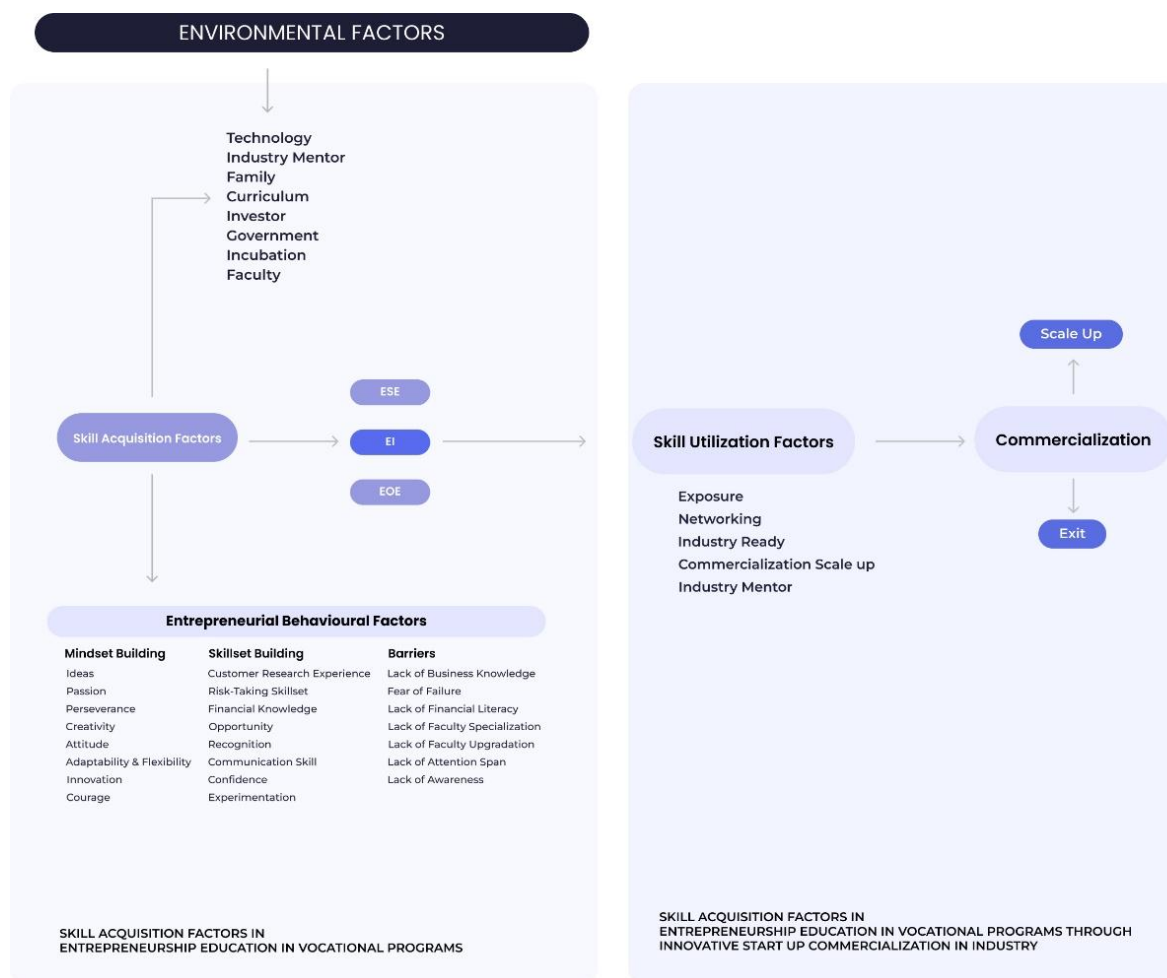


Figure II: Illustration of theme-wise factors showing the progression of entrepreneurial learning for students from skill acquisition to skill utilisation process

Source: Authors' creation

Figure II illustrates the thematic distribution of factors aligned with the SCCT, which suggests that environmental and personal factors shape entrepreneurial behaviour. This research identifies key factors relevant to the Indian polytechnic education system and highlights the importance of entrepreneurial intention (EI) in enhancing educational outcomes.

Focusing on building EI is vital for strengthening the vocational education system; ESE and EOE are identified as key antecedents in this process. A strong EI promotes effective utilisation of entrepreneurial skills, empowering individuals to confidently leverage their abilities into successful ventures. By enhancing these

factors within the education system, entrepreneurial preparedness can be improved and sustainable career pathways created.

3.2 Disparities in perception and commonalities of factors among stakeholders

Besides identifying the factors influencing entrepreneurship education, specifically vocational education at polytechnics in the Indian context, this research also sought to compare the perceptions of all key stakeholders regarding the factors driving the effectiveness of entrepreneurial courses. Table 2 highlights a comparison of their opinions.

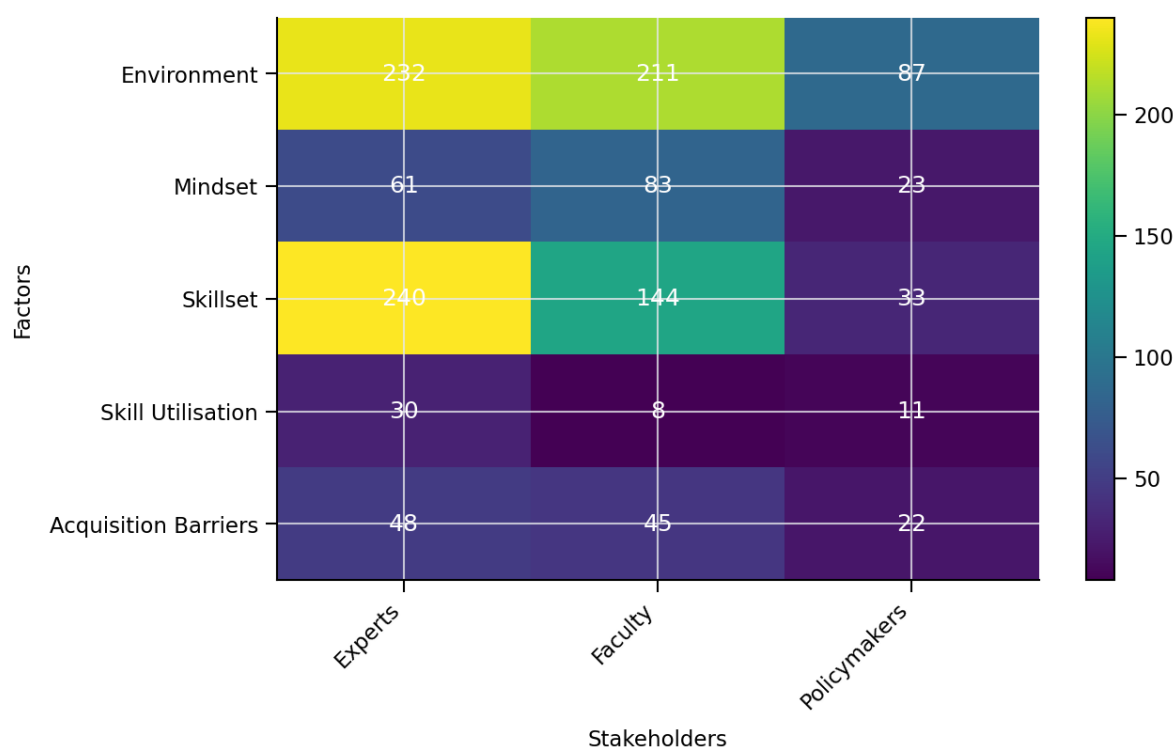


Figure III: Heatmap showing stakeholder-wise distribution of frequency of factors influencing skill acquisition and skill utilisation phases of entrepreneurial learning in polytechnic institutions

The heatmap represents experts, faculty and policymakers' relative weighting of the factors. The colour strength depends on the number of times the colour is mentioned. Clearly, environment and skillset come out as major factors among all stakeholders, especially the experts and faculty. The highest emphasis of the experts is placed on skillset (240) and environment (232), which suggests that they are keen on developing competency and skills practically and in context. These factors are also clearly brought up by faculty in their responses, but with lower intensity. Policymakers share these priorities, but at lower frequencies, indicating a more selective or structural focus. The skill utilization factor or barriers are given less importance across all groups, suggesting a potential gap between learning and applying the skills.

4. Conclusion

This study explored and provided qualitative perspectives from educators, policymakers, and industry leaders on entrepreneurship education within Indian vocational programs, offering

valuable insights.

The analysis closely addresses the key factors that affect the development and use of entrepreneurial competencies. Students are encouraged to understand how institutional, pedagogical, and environmental factors interact to shape students' skill set and mindset, both enabling and constraining their entrepreneurial behaviour in a polytechnic environment.

The narrative of entrepreneurship education in India is characterised by ambition, setbacks, and a strong determination to overcome systemic challenges. Social Cognitive Career Theory offers a valuable framework for analysing how various personal and environmental factors interact to shape entrepreneurial intentions and skills. At its core, SCCT emphasises the interplay among self-efficacy, outcome expectations, and entrepreneurial intentions, which collectively influence career choices and performance. This study aligns with SCCT by examining how entrepreneurship education enhances self-efficacy, how mentorship and networking influence outcome expectations, and how

environmental support structures shape career intentions. Themes of mindset and skillset are emerging in relation to building self-efficacy and competencies, and skill utilisation links to behaviour. The findings indicate that the acquisition of skills is not enough to drive entrepreneurial behaviour; rather, it is mediated by cognitive (mindset) and contextual (environment) factors, essentially an extension of SCCT to an understanding of entrepreneurial development in stages.

The institutional support and learning environment in this study, for example, significantly impact students' entrepreneurial self-efficacy. By being placed in a supportive academic-industry environment, students' confidence in their entrepreneurial endeavours grows, as does their willingness to take calculated risks. This connects directly to SCCT's premise that external influences shape internal beliefs, ultimately driving career decisions. In addition, cultivating a strong entrepreneurial mindset, which includes passion and perseverance, significantly reinforces self-efficacy. Passion is more than mere enthusiasm; it acts as the driving force that motivates students to chase their ideas despite obstacles. The study emphasises that, beyond just individual and environmental factors, institutional support plays a crucial role in shaping entrepreneurial aspirations, according to the SCCT. It highlights the need for entrepreneurship education institutions to align academic theory with industry practices, especially given the fast-paced technological advancements (Guerrero et al., 2020; Shrotriya & Dhir, 2018). Faculty members serve as vital educators and mentors, and their ability to incorporate AI and sustainable business practices, such as nature-positive strategies, into the curriculum is essential for preparing students for the realities of entrepreneurship today. Staying abreast of industry trends through partnerships allows faculty to provide students with practical experiences, fostering the confidence needed to navigate entrepreneurial uncertainties.

Of the identified factors, the most dominant are environment and skill set, especially during the skill acquisition phase. The importance of institutional support, learning environment, and competency building in forming entrepreneurial basic competencies is highlighted by faculty and experts. Policymakers, on the other hand, show a somewhat discounted focus, indicating a more structural approach to skill development.

The findings suggest a gradual shift from skill acquisition to skill utilisation, with some identified factors pointing to application-oriented learning and the presence of structural barriers, which help explain the growing complexity of moving from skill acquisition to entrepreneurial action. The low incidence of stakeholders using the term 'skill utilisation' indicates that this stage is underdeveloped in polytechnic education systems, thereby reducing the conversion of polytechnic-acquired skills into commercial or entrepreneurial outcomes.

This comparative analysis between the stakeholders also highlights the need to align institutional practices with industry expectations. While faculty members' perspective is more pedagogical and developmental, industry stakeholders are more focused on practicality and real-world application, pointing to a need for better incorporation of experiential and industry-related learning mechanisms in the polytechnic education system.

The results can be explained using a framework of Social Cognitive Career Theory (SCCT), emphasising the influence of personal factors on environmental factors in the development of career behaviours. The findings indicate that while the acquisition of skills is a component of entrepreneurial behaviour, it is also greatly affected by the enabling context and possibilities for application.

In general, the findings of this study demonstrate that entrepreneurial intent and behaviour development is a multi-stage, multi-factor process, and that the transition from entrepreneurial skill acquisition to utilisation is a more complex process that requires greater

institutional and ecosystem support. The study emphasises the importance of policy and pedagogical measures that go beyond curriculum design to enhance experiential learning, industry involvement, and support for the effective use of acquired skills.

5. Practical implication

Action points drawn from this research include co-working spaces, early mentorship, and multidisciplinary collaborations. Institutions must create dynamic entrepreneurship education models that are driven by ecosystem needs. Faculty should incorporate real-world experiences into their teaching, focusing on creativity, perseverance, and resilience through interactive, hands-on methods.

Collaborative spaces and internship opportunities must be provided to enable a safe environment for experimentation and growth.

These practices will prepare Indian students pursuing vocational education and training programs to confidently face a fast-paced, unpredictable future. With stronger values and mindsets, they will be able to assess situations better and learn from every failure as a stepping stone to success.

6. Theoretical implication

The study effectively applied SCCT (Social Cognitive Career Theory) to India, identifying key factors that impact the entrepreneurial journey, from skill acquisition to skill utilisation. It focused on the Indian vocational education and training system to prepare students to launch scalable businesses.

Research by Hussain et al. (2023) identifies passion as a crucial mediator linking training to career commitment, suggesting that structured entrepreneurship education can foster this vital trait. Perseverance, defined as the steadfast determination to continue despite challenges, is equally important. Joshi et al. (2024) found that well-designed entrepreneurial training programs can enhance this resilience, thereby boosting students' confidence in their ability to implement business concepts. When these

mindset factors are nurtured effectively, they enhance entrepreneurial self-efficacy (ESE), which is the belief in one's capacity to carry out entrepreneurial tasks, a fundamental aspect of SCCT. Furthermore, ESE acts as a bridge between positive entrepreneurial behaviour and entrepreneurial intentions (EI), facilitating the move from acquiring skills to effectively utilising them. When students build confidence in their entrepreneurial capabilities, they are more likely to turn their skills into real ventures, underscoring the importance of mindset development in entrepreneurship education. Environmental factors such as mentorship and networking are vital in shaping entrepreneurial outcome expectations (EOE).

According to the SCCT, when individuals encounter successful role models and receive guidance, they tend to develop stronger beliefs that their entrepreneurial efforts will lead to positive outcomes, including financial success, social recognition, and personal satisfaction. For instance, a student who connects with industry mentors and networks with successful entrepreneurs is more likely to believe that starting their own business can result in favourable rewards. This aligns with Bengtsson's (2014) research, which indicates that creativity thrives in an ecosystem that fosters innovation and problem-solving through collaboration rather than as an isolated trait.

By incorporating these factors, it could establish a comprehensive framework to enhance entrepreneurship education. The study emphasises modern, experiential learning methods and customised strategies that align with the real-world demands of entrepreneurship. Additionally, it provides practical recommendations for educators and policymakers to develop programs that effectively nurture entrepreneurial potential across diverse contexts.

7. Limitations and future direction

The study provides valuable insights into the Indian vocational education system; however, its applicability to other developing countries may

require further refinement. Further research in diverse contexts could strengthen these conclusions and inform the development of suitable theoretical frameworks.

While qualitative inputs explored crucial entrepreneurial perspectives, future research should quantitatively test the factors influencing entrepreneurial skill acquisition, skill utilisation, barriers, and strategic recommendations. Additionally, a longitudinal approach is essential to examining the development of mindsets over time. This approach would enable a deeper understanding of how individuals can optimise their potential during entrepreneurial skill development training in vocational programs.

Ultimately, it would provide greater clarity on the system's current state and identify areas for improvement.

Conflict of Interest

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