International Journal of Trend in Scientific Research and Development (IJTSRD)
Volume 8 Issue 6, Nov-Dec 2024 Available Online: www.ijtsrd.com e-ISSN: 2456 – 6470

Understanding the Entrepreneurial Mindset: Why Engineering Students Choose Startups Over Traditional Careers

Prof. Ehtesham Ahmad[1], Aaisha Aleem[2]

[1]Head and Professor, Department of Commerce,
[2]Senior Research Fellow (SRF), Department of Commerce,
[1,2]Khwaja Moinuddin Chishti Language University, Lucknow, Uttar Pradesh, India

ABSTRACT

This study explores the factors influencing engineering students' preference for entrepreneurship over traditional career paths, focusing on emerging economies like India. Recent trends indicate a significant shift among engineering graduates toward startups driven by opportunities for innovation, autonomy, financial independence, and societal impact. Entrepreneurship offers students an avenue to apply technical expertise and creative problem-solving skills in real-world contexts, often surpassing the constraints of conventional employment. Through an exploratory quantitative methodology, data were collected via a questionnaire of 270 engineering students from the top five developed cities in Uttar Pradesh, including Lucknow, Kanpur, Noida, Varanasi, and Prayagraj. Principal Component Analysis revealed that autonomy, financial rewards, practical skill application, leadership, and personal growth drive entrepreneurial aspirations. Students are particularly drawn to creating their ventures, managing teams, and contributing to economic growth through job creation. The research highlights critical challenges, including financial constraints, regulatory hurdles, and societal expectations, which deter students from pursuing entrepreneurial careers. It also underscores the pivotal role of educational institutions in fostering entrepreneurial intent by integrating entrepreneurship into engineering curricula, offering experiential learning opportunities, and providing access to resources like mentorship and funding. This study provides suitable suggestions for educators, policymakers, and industry stakeholders to create supportive ecosystems that encourage and sustain entrepreneurial ambition among engineering students. By aligning education with the needs of a dynamic startup ecosystem, stakeholders can empower students to drive technological innovation and contribute to economic development.

How to cite this paper: Prof. Ehtesham Ahmad | Aaisha Aleem "Understanding the Entrepreneurial Mindset: Why Engineering Students Choose Startups Over Traditional Careers" Published in International Journal of Trend in Scientific Research and Development (ijtsrd), ISSN: 2456-6470, Volume-8 | Issue-6, December 2024, pp.956-962, URL: www.ijtsrd.com/papers/ijtsrd72702.pdf

IJTSRD72702

KEYWORDS: *Entrepreneurship, Startups, Engineering, Innovation, Education*

INTRODUCTION

In recent years, there has been a significant shift in career preferences among engineering students, with an increasing number opting for entrepreneurial ventures, particularly startups, instead of pursuing traditional career paths in established organizations. Engineering education equips students with technical expertise, problem-solving skills, and innovative thinking, naturally motivating them to engage in entrepreneurial activities. Despite the stability and financial security offered by conventional careers in large corporations, many students are drawn to the dynamic and often risky world of startups. This shift is particularly prominent in emerging economies, where the entrepreneurial ecosystem has become a powerful driver of economic growth and technological innovation (Nabi et al., 2017). The global focus on innovation and technology has significantly impacted the career choices of engineering graduates. Startups provide students a platform to explore disruptive technologies, experiment with creative solutions, and work on cutting-edge innovations addressing societal and environmental challenges. These opportunities often surpass those available in traditional roles, where employees may face rigid structures and limited opportunities for creative expression (Audretsch,

2012). Furthermore, the success stories of entrepreneurs such as Elon Musk, Sundar Pichai, and others, widely circulated in popular media, have inspired engineering students to dream big and pursue their ideas with passion and determination (Bosma et al., 2020).

Macroeconomic factors also drive the rise of entrepreneurial interest. The increasing prevalence of startup-friendly policies, such as India's "Startup India" initiative, has created a supportive ecosystem for budding entrepreneurs. These initiatives often include tax exemptions, financial grants, and access to business incubators, reducing barriers to entry into entrepreneurship (Sharma & Kukreja, 2021). Moreover, globalization and advancements in digital technology have significantly lowered the cost of launching startups, making entrepreneurship a viable career option for students from diverse socio-economic backgrounds (Levie & Autio, 2008). Several intrinsic and extrinsic factors influence the entrepreneurial aspirations of engineering students. On a personal level, the desire for autonomy, creativity, and self-actualization drives many toward entrepreneurship (Kolvereid, 1996). Startups offer the freedom to innovate, create unique solutions, and establish a sense of ownership, all of which appeal to engineering graduates seeking fulfillment beyond monetary rewards (Douglas & Shepherd, 2002). On the other hand, external influences such as peer networks, exposure to entrepreneurial role models, and participation in innovation-driven programs significantly shape entrepreneurial intentions (Bandura, 1986). However, pursuing entrepreneurship is not without its challenges. Many students struggle to secure initial funding, build viable business models, and navigate regulatory complexities (Shane, 2003). Social factors, such as cultural expectations and family pressures to pursue stable jobs, often deter students from taking the risk of starting their ventures (Hofstede et al., 2004). Additionally, gaps in entrepreneurial education and lack of exposure to real-world business environments in engineering curricula further exacerbate these challenges (Lackéus, 2015).

The role of educational institutions in addressing these challenges and fostering an entrepreneurial mindset cannot be overstated. Universities act as incubators of innovation, providing students with access to knowledge resources, mentorship, and collaborative opportunities. Programs such as design thinking workshops, hackathons, and interdisciplinary projects help students develop essential entrepreneurial skills, including critical thinking, adaptability, and teamwork (Pittaway & Cope, 2007). Furthermore, institutional initiatives integrating entrepreneurship into engineering education, such as partnerships with industry, startup accelerators, and access to venture capital networks, play a crucial role in empowering students to pursue entrepreneurial careers (Gibb, 2002). This study examines the factors influencing engineering students' preference for entrepreneurship over traditional careers. By analyzing the motivations, challenges, and institutional factors shaping their decisions, the research aims to provide a comprehensive understanding of the entrepreneurial mindset. In doing so, it will offer actionable insights to educators, policymakers, and industry stakeholders on better supporting and fostering entrepreneurship among engineering students.

Research Objectives

- To discover the factors that attract engineering students to an entrepreneurial career.

Review of Literature

Entrepreneurship has emerged as a critical career option for engineering students, offering innovation, autonomy, and financial independence opportunities. The entrepreneurial mindset, the ability to identify opportunities, take calculated risks, and overcome challenges, has been widely discussed in the literature (Krueger & Brazeal, 1994). Engineering students are uniquely positioned to embrace entrepreneurship due to their technical expertise, problem-solving abilities, and exposure to cutting-edge technologies (Douglas & Shepherd, 2002). Moreover, the global startup boom and the success stories of engineers-turned-entrepreneurs like Elon Musk and Jeff Bezos have inspired a generation to consider startups over conventional corporate roles (Bosma et al., 2020). Entrepreneurial intent, a precursor to entrepreneurial behavior, is shaped by a mix of intrinsic motivations and extrinsic influences. Shane (2003) identifies the need for autonomy, creativity, and financial rewards as primary motivators for entrepreneurship. Unlike traditional jobs, startups allow individuals to exercise creative freedom and take ownership of their work. The opportunity to address real-world problems and develop innovative solutions is particularly appealing for engineering students. Additionally, societal factors, such as the glamorization of startup culture and increased media coverage of entrepreneurial success, have significantly influenced students' career aspirations (Kolvereid, 1996). Educational institutions play a transformative role in shaping the entrepreneurial mindset. Lackéus (2015) highlights the importance of entrepreneurship education in enhancing self-efficacy, critical thinking, and risk tolerance among students. Universities that integrate

entrepreneurship into their curriculum through courses, workshops, and experiential learning provide students with the skills and confidence to pursue entrepreneurial careers (Pittaway & Cope, 2007). Business plan competitions, hackathons, and startup incubation programs have proven effective in fostering a culture of innovation and risk-taking. Furthermore, mentorship programs and partnerships with industry leaders bridge the gap between theoretical knowledge and practical application, equipping students with the tools to succeed as entrepreneurs (Nabi et al., 2017). The entrepreneurial ecosystem surrounding educational institutions significantly impacts students' career choices. Access to resources, such as funding, mentorship, and infrastructure, creates a conducive environment for aspiring entrepreneurs (Levie & Autio, 2008). University-affiliated incubators and accelerators provide students with the necessary support to launch and scale their ventures. Additionally, peer networks and exposure to successful entrepreneurial role models positively influence students' intentions to pursue startups (Bandura, 1986). The presence of robust ecosystems, such as Silicon Valley in the United States or Bengaluru in India, further amplifies entrepreneurial activity among engineering graduates (Audretsch, 2012).

Engineering students face significant challenges in this career path despite the growing interest in entrepreneurship. Financial constraints, regulatory complexities, and lack of business acumen are common barriers (Shane, 2003). Cultural and societal expectations, particularly in collectivist societies, often discourage risk-taking and entrepreneurship in favor of stable, high-paying jobs (Hofstede et al., 2004). Family pressures and the fear of failure are additional factors that hinder entrepreneurial aspirations. These challenges underscore the importance of institutional support and policy interventions in promoting entrepreneurship. Emerging technologies and digital platforms have revolutionized the entrepreneurial landscape, making it more accessible for engineering students. Technologies such as artificial intelligence, blockchain, and renewable energy have opened up new avenues for innovation (Rothaermel et al., 2007). Crowdfunding platforms, online courses, and digital marketplaces have lowered barriers to entry, enabling students to launch ventures with minimal resources (Mollick, 2014). Additionally, government initiatives like "Startup India" and "Make in India" have provided tax incentives, funding opportunities, and mentorship to young entrepreneurs, further encouraging engineering students to explore startups as viable career options (Sharma & Kukreja, 2021). Cultural and regional variations significantly influence entrepreneurial aspirations. Individualistic cultures prioritizing innovation, independence, and self-reliance tend to encourage entrepreneurship more than collectivist cultures, which emphasize stability and group harmony (Hofstede et al., 2004). Regional disparities in access to resources, mentorship, and funding also play a critical role in shaping entrepreneurial intent. For example, students in urban centers with established startup ecosystems are likelier to pursue entrepreneurship than those in rural areas with limited support (Bosma et al., 2020). Multidisciplinary collaboration has emerged as a key factor in entrepreneurial success. Engineering students who collaborate with peers from business, design, and humanities backgrounds gain a broader perspective on innovation and problem-solving (Pittaway & Cope, 2007). Such collaborations enable the development of comprehensive solutions and sustainable business models, bridging the gap between technical expertise and market needs. Furthermore, participation in interdisciplinary projects enhances students' ability to navigate complex challenges, a critical skill for entrepreneurial success. While the literature provides valuable insights into the factors influencing entrepreneurial intentions among engineering students, several research gaps remain. The long-term impact of entrepreneurial education on career trajectories is still underexplored. Moreover, there is limited research on the role of gender, socioeconomic background, and the influence of family support on entrepreneurial aspirations. Future studies could also examine the effectiveness of specific institutional interventions, such as mentorship programs and startup incubators, in fostering entrepreneurial success. Exploring these dimensions would provide a more comprehensive understanding of why engineering students choose startups over traditional careers.

Research Methodology

This study employs an exploratory and quantitative approach to delve into the experiences and perspectives of engineering students, focusing on their entrepreneurial aspirations and career preferences. Data was meticulously collected through thoughtfully designed questionnaires distributed among a diverse group of 270 engineering students from the top five developed cities in Uttar Pradesh, including Lucknow, Kanpur, Noida, Varanasi, and Prayagraj. These cities were selected for their vibrant academic ecosystems and burgeoning entrepreneurial landscapes, offering a rich context for the research. A purposive sampling method was utilized to engage actively enrolled engineering students, ensuring that the findings provide an authentic and representative

view of this dynamic cohort. This methodology captures the students' academic and entrepreneurial inclinations and reflects regional variations and contextual influences, adding depth and nuance to the study.

Data Analysis and Interpretation

Table 1.1-Total Variance Explained

Total Variance Explained						
Component	Initial Eigenvalues			Extraction Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	**3.790**	**63.167**	**63.167**	3.790	63.167	63.167
2	.831	13.855	77.021			
3	.459	7.648	84.669			
4	.387	6.442	91.111			
5	.332	5.539	96.650			
6	.201	3.350	100.000			
Extraction Method: Principal Component Analysis.						

Interpretation- The table showed that Component 1, which explains 63.167% of the total variance, suggests that it is the most important factor in explaining the Factors that Attract toward an Entrepreneurial Career.

Figure 1.1 -Scree Plot

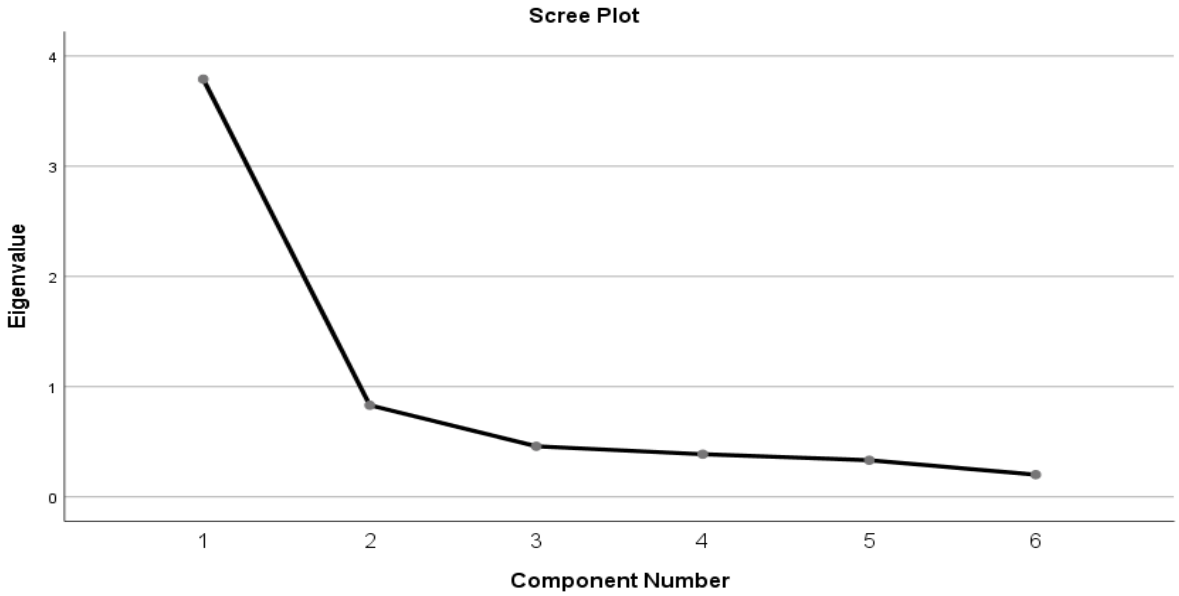

Table 1.2 - Component Matrix

Component Matrix[a]	
	Component 1
35.Opportunity to create one's own project/venture and to not seek employment.	.869
34.Opportunity to build, develop and manage team of people.	.867
36. Opportunity to take on risks and grow one's business and create jobs.	.771
37. Opportunity to earn more by investing more time, resources and energy, which is not possible in salaried job.	.769
33.Opportunity to develop and manifest skills in practical business environment.	.748
32. Opportunity to grow personal competence/skills.	.732
Extraction Method: Principal Component Analysis.	
a. 1 components extracted.	

Interpretation—The "Total Variance Explained" table 1.1 reveals that Component 1 accounts for 63.167% of the total variance, making it the most significant factor in explaining the variables influencing engineering students' preference for an entrepreneurial career. This component's high contribution indicates that its underlying variables are highly interrelated and collectively dominant in shaping entrepreneurial intent. The

subsequent components contribute minimal variance, with the second highest at 13.855%, suggesting their impact is minor and not critical for further analysis. The most important variables of Factors that Attract toward Entrepreneurial Career within each component, as found from the above table, are as provided below-

Component 1 showed the following six variables-

1. Opportunity to create one's own project/venture and to not seek employment.
2. Opportunity to build, develop, and manage a team of people.
3. Opportunity to take on risks, grow one's business, and create jobs.
4. Opportunity to earn more by investing more time, resources, and energy, which is not possible in a salaried job.
5. Opportunity to develop and manifest skills in the practical business environment.
6. Opportunity to grow personal competence/skills.

1. Dominance of Autonomy and Innovation

The high loadings on variables such as **"Opportunity to create one's own project/venture"** and **"Opportunity to build, develop, and manage a team"** suggest that engineering students are motivated primarily by **autonomy** and the opportunity to innovate. These findings are consistent with previous research, which shows that young entrepreneurs often seek freedom in decision-making and the chance to work on novel ideas without being confined by the rules of established organizations (Kuratko, 2005). This indicates that many engineering students seek financial rewards and a creative outlet to implement their vision.

Implication: Universities and educational institutions should enhance their entrepreneurial programs to foster an environment where students can experiment, create, and lead. By integrating entrepreneurial thinking into the curriculum, offering innovation labs, and encouraging student-led ventures, institutions can cultivate a mindset that aligns with students' natural inclinations toward autonomy and innovation.

2. Financial Independence and Career Growth

The findings emphasize that engineering students are attracted to entrepreneurship because of the **potential for higher financial rewards** and the **ability to scale their income** based on effort and input. As highlighted by the variable **"Opportunity to earn more by investing more time, resources, and energy,"** students perceive entrepreneurship as a path to greater financial freedom than a traditional salaried job. This preference for financial independence may also be linked to the increasing recognition of entrepreneurial ventures as viable, scalable sources of wealth, especially in the tech and innovation sectors.

Implication: Educational institutions should emphasize financial literacy, risk management, and business acumen in their programs. By preparing students for the financial challenges of entrepreneurship, including investment strategies, cost management, and revenue growth, universities can equip future entrepreneurs with the practical skills necessary for sustainable business success.

3. Practical Skill Development and Real-World Application

The variable **"Opportunity to develop and manifest skills in a practical business environment"** highlights that students are motivated by the opportunity to apply their theoretical knowledge in real-world settings. Engineering students, known for their problem-solving and analytical skills, are eager to translate their academic learning into practical, actionable solutions. This inclination towards practical experience underscores the growing importance of bridging the gap between theory and practice in education.

Implication: Universities should foster partnerships with startups, industry leaders, and entrepreneurs to provide students with internships, co-op programs, or startup incubators. These experiences offer students a direct link to the entrepreneurial ecosystem, enabling them to develop critical skills such as project management, product development, and team coordination. Practical exposure can also help mitigate startup launch risks by giving students hands-on experience in real-world business environments.

4. Leadership and Job Creation

The significant weight given to the variable **"Opportunity to take on risks, grow one's business, and create jobs" suggests that engineering students are not only motivated by personal gain but also** by the potential to contribute to society by creating jobs. The notion of job creation aligns with broader societal goals, such as economic development and fostering innovation in local communities. Entrepreneurship is increasingly seen as a mechanism for job creation, especially in regions where traditional job markets are saturated or limited.

Implication: Governments and policymakers should support the development of an entrepreneurial ecosystem that encourages the establishment of new ventures and job creation. Policies that provide tax incentives for startups reduce market entry barriers, and increase venture capital access can help create a

supportive environment for aspiring entrepreneurs. Encouraging collaboration between universities, governments, and private sectors can create an integrated support system for students considering entrepreneurial careers.

5. Personal Growth and Competence Building

Finally, the variable **"Opportunity to grow personal competence/skills"** emphasizes the importance of self-improvement and personal development. Engineering students are not just looking for financial success but also for a career that enhances their abilities, builds their resilience, and sharpens their leadership skills. Entrepreneurship offers a pathway for students to grow holistically—both professionally and personally.

Implication: To nurture these aspirations, educational institutions must provide platforms for personal development alongside academic instruction. This could include mentorship programs, leadership training workshops, and entrepreneurial challenges that focus not only on technical skills but also on soft skills such as communication, negotiation, and emotional intelligence.

This research has explored the factors influencing engineering students' preference for entrepreneurial careers, particularly their inclination to choose startups over traditional employment opportunities. The study identified several key motivators driving this shift through a comprehensive analysis, including the desire for **autonomy**, **financial independence**, **practical skill development**, and **leadership opportunities**. The data revealed that engineering students are highly attracted to creating their own ventures, managing teams, and taking risks to grow their businesses. These factors align with the intrinsic and extrinsic rewards of entrepreneurship.

The findings suggest that engineering students are motivated not only by financial gain but also by personal growth, innovation, and the opportunity to make a significant societal impact through job creation. The emphasis on practical skill development and real-world application of knowledge indicates a growing trend where students seek more than just theoretical education; they aim for hands-on experiences that enable them to thrive in the business world.

Educational institutions play a critical role in shaping entrepreneurial intent. By fostering environments encouraging autonomy, creativity, and skill development, universities can equip students with the tools and mindset needed to succeed in the entrepreneurial landscape. The study also highlights the importance of creating supportive ecosystems that include mentorship programs, industry partnerships, and access to funding to help students transition from academic settings to entrepreneurial ventures.

In conclusion, this research underscores the significance of entrepreneurship in the career choices of engineering students and emphasizes the need for a more integrated approach in education that encourages entrepreneurial thinking. As engineering students continue to gravitate toward startups, it becomes crucial for educational institutions, policymakers, and industry leaders to work collaboratively to nurture and sustain this entrepreneurial drive, ultimately contributing to the growth of the startup ecosystem and the broader economy.

Citations:

Here is the reference list arranged in alphabetical order in APA style:

[1] Ajzen, I. (1991). The theory of planned behavior. *Organizational Behavior and Human Decision Processes, 50*(2), 179-211.

[2] Audretsch, D. B. (2012). Determinants of high-growth entrepreneurship. *OECD LEED Programme*.

[3] Bandura, A. (1986). *Social Foundations of Thought and Action: A Social Cognitive Theory*. Prentice-Hall.

[4] Bosma, N., Schott, T., Terjesen, S., & Kew, P. (2020). Global Entrepreneurship Monitor 2019/2020: Global report. *GEM Consortium*.

[5] Douglas, E. J., & Shepherd, D. A. (2002). Self-employment as a career choice: Attitudes, entrepreneurial intentions, and utility. *Entrepreneurship Theory and Practice, 26*(3), 81-90.

[6] Gibb, A. (2002). In pursuit of a new 'enterprise' and 'entrepreneurship' paradigm for learning: Creative destruction, new values, new ways of doing things, and new combinations of knowledge. *International Journal of Management Reviews, 4*(3), 233-269.

[7] Hofstede, G., Hofstede, G. J., & Minkov, M. (2004). *Cultures and Organizations: Software of the Mind* (2nd ed.). McGraw-Hill.

[8] Krueger, N. F., & Brazeal, D. V. (1994). Entrepreneurial potential and potential entrepreneurs. *Entrepreneurship Theory and Practice, 18*(3), 91-104.

[9] Kolvereid, L. (1996). Prediction of employment status choice intentions. *Entrepreneurship Theory and Practice, 21*(1), 47-57.

[10] Lackéus, M. (2015). Entrepreneurship in Education: What, Why, and How. *OECD Education Working Papers, No. 114*. OECD Publishing, Paris.

[11] Levie, J., & Autio, E. (2008). A theoretical grounding and test of the GEM model. *Small Business Economics, 31*(3), 235-263.

[12] Mollick, E. (2014). The dynamics of crowdfunding: An exploratory study. *Journal of Business Venturing, 29*(1), 1-16.

[13] Nabi, G., Walmsley, A., & Mwasalwiba, E. (2017). A cross-cultural study of entrepreneurship education and graduate entrepreneurial intentions. *Education and Training, 59*(2), 212-230.

[14] Pittaway, L., & Cope, J. (2007). Entrepreneurship education: A systematic review of the evidence. *International Small Business Journal, 25*(5), 479-510.

[15] Rothaermel, F. T., Agung, S. D., & Jiang, L. (2007). The influence of competitive environment and university involvement on the creation of industrial clusters. *Academy of Management Journal, 50*(1), 99-119.

[16] Shane, S. (2003). *A General Theory of Entrepreneurship: The Individual-Opportunity Nexus*. Edward Elgar Publishing.

[17] Sharma, R., & Kukreja, S. (2021). Impact of 'Startup India' initiative on entrepreneurial growth: A policy analysis. *Indian Journal of Entrepreneurship Research, 15*(4), 57-71.