

Campus to Company: Exploring Engineering Students' Entrepreneurial Interest in Startups

Gokul. S^{1*} | Dr. Kabirdoss Devi²

¹II MBA, General, Department of Management Studies, Vels Institute of Science Technology and Advanced Studies (VISTAS) Pallavaram.

²Associate Professor Department of Management Studies, Vels Institute of Science Technology and Advanced Studies (VISTAS) Pallavaram.

*Corresponding Author: kabirdossdevi.sms@vistas.ac.in

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ABSTRACT

Entrepreneurship is increasingly seen as a key force behind economic growth, innovation, and job creation, especially among young graduates. However, even though engineering students often possess strong technical skills and problem-solving abilities, many of them hesitate to take the step toward starting their own ventures. This study explores the gap between students' interest in entrepreneurship and their actual involvement in startup activities. The main objective of the research is to understand the level of entrepreneurial interest among engineering students and identify the factors that influence their inclination toward startups. A quantitative research approach was adopted, and primary data was collected from 300 engineering students through a structured questionnaire. The collected data was analyzed using SPSS, applying tools such as descriptive statistics, Karl Pearson correlation, Chi-square test, and ANOVA to examine relationships and differences among variables. The findings indicate that most engineering students have a positive attitude toward entrepreneurship. Key factors such as entrepreneurship education, self-efficacy, social influence, and institutional support play a significant role in shaping their entrepreneurial intentions. However, despite this interest, a noticeable gap exists between intention and actual startup initiation. This gap is mainly attributed to challenges like fear of failure, lack of financial resources, and limited practical exposure. The study concludes that improving hands-on entrepreneurship education, strengthening institutional support, and providing better exposure to real-world startup environments can help bridge the gap between academic learning and entrepreneurial action.

Keywords: Entrepreneurial Intention, Engineering Students, Startups, Self-Efficacy, Entrepreneurship Education, Institutional Support.

Introduction

Entrepreneurship has become an essential driver of economic growth, innovation, and employment generation in today's global economy. Over the past few years, there has been a clear shift in the career preferences of young individuals, especially students. Many are gradually moving away from traditional job-oriented paths and exploring more independent, creative, and innovation-driven careers. This change is largely influenced by rapid technological advancements, easier access to information, and the increasing visibility of successful startup stories across industries. As a result, entrepreneurship is no longer viewed purely as a risky alternative but is increasingly recognized as a promising and viable career option.

In this changing environment, startups have gained considerable importance as they act as catalysts for innovation and economic development. They enable individuals to transform ideas into practical solutions, contributing not only to business growth but also to societal progress and technological advancement. Recognizing this potential, governments and educational institutions have started promoting entrepreneurship through various initiatives such as startup funding schemes, incubation centers, training programs, and supportive policies aimed at encouraging young entrepreneurs.

Engineering students hold a particularly important position within this entrepreneurial ecosystem. Their strong technical knowledge, analytical thinking, and problem-solving abilities provide a solid foundation for developing innovative products and services. Engineering education often exposes students to real-world challenges, helping them identify gaps that can be converted into business opportunities. However, despite having this potential, not all engineering students choose entrepreneurship as a career, raising important questions about what influences their decisions.

The journey from campus to establishing a company is not always straightforward. Although many students express interest in entrepreneurship, several challenges prevent them from taking concrete steps. Common barriers include lack of practical exposure, limited access to financial resources, fear of failure, and inadequate institutional support. In addition, social factors such as family expectations, societal norms, and peer influence significantly affect students' career choices.

At the same time, certain factors play a positive role in shaping entrepreneurial intention. Entrepreneurship education helps build awareness, skills, and motivation among students. Self-efficacy, which refers to an individual's confidence in their ability to perform entrepreneurial tasks, is another critical factor. Moreover, a supportive institutional ecosystem—through incubation centers, mentorship, networking opportunities, and industry collaborations—can greatly enhance students' confidence and willingness to pursue startup ventures.

Problem Statement

Despite the growing interest in entrepreneurship among engineering students, a noticeable gap exists between their intention to start a business and their actual involvement in startup activities. While many students express enthusiasm toward entrepreneurship, only a small proportion take the initiative to establish ventures. This gap highlights the presence of underlying challenges and influencing factors that need to be understood more clearly. Therefore, identifying the key determinants of entrepreneurial intention and the barriers that hinder its conversion into action is essential for promoting effective entrepreneurial development among engineering students.

Objectives of the Study

- To assess the level of entrepreneurial interest among engineering students
- To identify the key factors that influence their inclination toward starting a business
- To examine the relationship between important variables such as self-efficacy, entrepreneurship education, and social influence
- To offer practical suggestions for improving entrepreneurial participation among students

Research Questions

- What is the current level of entrepreneurial interest among engineering students?
- Which factors play a major role in shaping their intention to start a business?
- Is there a meaningful relationship between self-efficacy and entrepreneurial intention?

Structure of the Study

This study is organized in a systematic manner to ensure clarity and logical flow. The introduction sets the context by explaining the background and importance of the topic. The literature review examines existing studies and highlights the research gaps that justify the present work. The research methodology section outlines the methods used for data collection and analysis. This is followed by the results and discussion, where the findings are presented and interpreted in detail. Finally, the conclusion summarizes the key insights of the study and provides suggestions, along with directions for future research.

Literature Review

Souitaris, Zerbinati, and Al-Laham (2007) examined the impact of entrepreneurship programs on science and engineering students. Their findings showed that such programs significantly enhance entrepreneurial intention, especially by inspiring students and providing access to resources rather than focusing solely on theoretical knowledge. The study highlights the importance of experiential learning in encouraging students to consider entrepreneurship as a viable career option.

Krueger, Reilly, and Carsrud (2000) applied the Theory of Planned Behavior to understand entrepreneurial intention. They identified three key factors—attitude toward entrepreneurship, subjective norms, and perceived behavioral control—as major predictors. Their findings suggest that students are more likely to pursue entrepreneurship when they see it as both desirable and achievable.

Thompson (2009) defined entrepreneurial intention as a conscious state of mind that directs individuals toward starting a business. The study emphasized that intention is a strong predictor of actual entrepreneurial behavior, making it an important variable to study among students.

Turker and Selcuk (2009) focused on the role of institutional support in shaping entrepreneurial intention. Their research found that both educational and structural support systems within universities significantly influence students' willingness to start a business. The study underlines the importance of universities in creating a supportive entrepreneurial environment.

Tong, Tong, and Loy (2011) explored various influencing factors such as need for achievement, family background, and subjective norms. Their findings revealed that students from entrepreneurial families are more likely to develop startup intentions due to early exposure to business practices.

Shiri, Hosseini, and Mohammadi (2012) examined the social and psychological aspects influencing entrepreneurial intention. The study highlighted the importance of role models and social norms, showing that students are more inclined toward entrepreneurship when they are surrounded by supportive social environments.

Verheul et al. (2012) investigated gender differences in entrepreneurial intention and found that male students generally exhibit higher entrepreneurial intention than female students. However, the study also noted that effective education and support systems can help reduce this gap.

Kautonen, Van Gelderen, and Fink (2015) analyzed the link between entrepreneurial intention and actual behavior. Their findings confirmed that intention is a strong predictor of business creation, although external challenges such as lack of financial resources may prevent individuals from taking action.

Shirokova, Osiyevskyy, and Bogatyreva (2016) studied the influence of the university environment on entrepreneurial intention. They found that students who are exposed to entrepreneurial ecosystems, mentorship, and networking opportunities are more likely to engage in startup activities.

Nabi et al. (2017) evaluated entrepreneurship education programs and concluded that they positively impact students' entrepreneurial skills and intentions. The study also emphasized that practical exposure is more effective than purely theoretical learning.

Li and Wu (2019) highlighted the importance of experiential learning approaches such as teamwork and project-based learning. Their findings showed that such methods significantly improve entrepreneurial intention among students.

Lingappa, Shah, and Mathew (2020) focused on engineering students in India and found that peer influence and institutional support play a significant role in shaping entrepreneurial interest.

Swarupa and Goyal (2020) conducted a comprehensive review and emphasized that entrepreneurship education is a key driver in developing startup interest among students, particularly in higher education institutions.

Li and Islam (2021) examined the role of government policies and support systems. Their study found that financial incentives, funding opportunities, and startup support programs significantly influence students' entrepreneurial intentions.

Maheshwari et al. (2022) conducted a systematic review identifying psychological traits, educational exposure, and environmental support as major determinants of entrepreneurial intention. The study stressed the importance of integrating entrepreneurship into academic curricula to encourage startup activities among students.

Conceptual Framework

Based on the theories and insights discussed in the literature, this study proposes that entrepreneurial interest among engineering students is shaped by a combination of key factors—namely entrepreneurship education, self-efficacy, social influence, and institutional support. These elements work together to influence how students perceive entrepreneurship and ultimately affect their intention to start a business. In simple terms, when students feel confident in their abilities, receive proper education, are supported by their environment, and are influenced positively by people around them, they are more likely to consider entrepreneurship as a career option.

Hypotheses Development

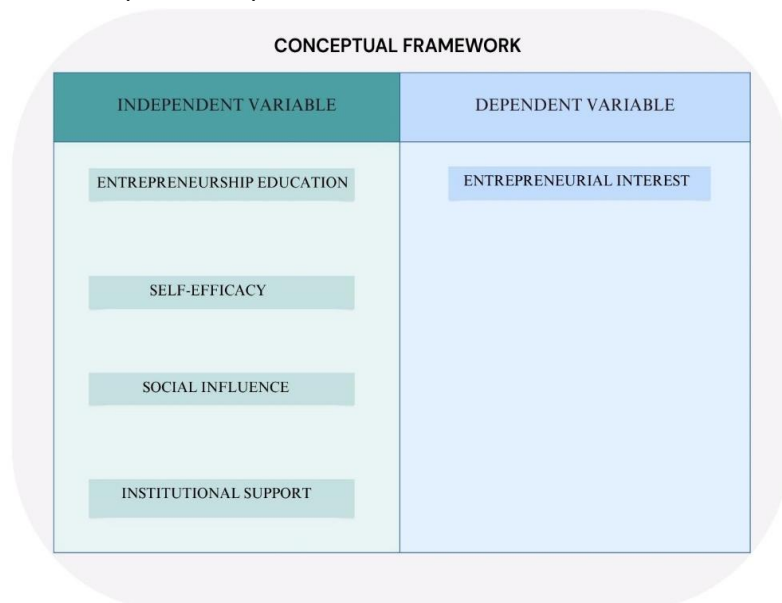
H₁: Entrepreneurship education has a significant positive impact on entrepreneurial intention.

H₂: Self-efficacy positively influences entrepreneurial interest.

H₃: Social influence significantly affects entrepreneurial intention.

H₄: Institutional support positively impacts entrepreneurial interest.

Conceptual Framework: (DIAGRAM)



Research Design

- Descriptive Design

Target Population

- The target population for the study consists of engineering students pursuing undergraduate and postgraduate programs in Chennai.

Sampling Technique

- The study uses a convenience sampling technique.

Sample Size - 300 respondents

Data Collection Methods

The study is based on primary data sources.

- **Primary:** Questionnaire

These techniques help in testing hypotheses and drawing meaningful conclusions from the data.

Data Analysis Techniques

The collected data was analyzed using **SPSS (Statistical Package for the Social Sciences)**, which offers reliable tools for handling and interpreting quantitative data.

The analysis was carried out in two main stages:

- **Descriptive Analysis**

Descriptive statistics, such as percentage analysis, were used to summarize the demographic details of respondents and their responses. This helps in identifying general trends and understanding the overall pattern of the data.

- **Inferential Analysis**

To draw deeper insights and test the hypotheses, the following statistical techniques were applied:

- **Karl Pearson Correlation**

Used to measure the strength and direction of the relationship between variables, such as self-efficacy and entrepreneurial intention.

- **Chi-Square Test**

Applied to examine the association between categorical variables, such as demographic factors and entrepreneurial interest.

- **ANOVA (Analysis of Variance)**

Used to identify whether there are significant differences in entrepreneurial intention across different groups.

Results and Data Analysis

Descriptive Statistics

Variable	Mean	Std. Deviation	Variance
Entrepreneurship Education	8.2933	2.54734	6.489
Family Business Background	8.6033	2.90185	8.421
Access to Startup Ecosystem	8.6533	3.06886	9.418
Financial Support Perception	8.0167	2.41713	5.843
Peer Influence	7.9433	2.25916	5.104
Entrepreneurial Self Efficacy	8.2667	2.63541	6.945
Attitude Toward Entrepreneurship	8.3133	2.88494	8.323
Risk Taking Propensity	8.33	2.66297	7.091
Entrepreneurial Interest in Startups	8.04	2.54296	6.467

Analysis Using Karl Pearson's Correlation

Correlation is a statistical measure that describes the strength and direction of the relationship between two variables.

Hypothesis

- **Null Hypothesis (H0):** There is no significant relationship on students' understanding, skills, and readiness for starting a business.
- **Alternative Hypothesis (H1):** There is a significant positive relationship on students' understanding, skills, and readiness for starting a business.

	EEI	FBB	ASE	FSP	PI	ESE	ATE	EIS	RTP
EEI	1								
FBB	0.621	1							
ASE	0.704	0.773	1						
FSP	0.688	0.727	0.695	1					
PI	0.725	0.729	0.708	0.828	1				
ESE	0.761	0.758	0.740	0.804	0.857	1			
ATE	0.731	0.792	0.778	0.736	0.786	0.904	1		
EIS	0.650	0.677	0.543	0.745	0.690	0.648	0.691	1	
RTP	0.708	0.804	0.760	0.748	0.669	0.765	0.806	0.722	1

Metric	Value	Interpretation
Pearson Correlation (r)	0.650	Strong positive correlation
P- Value	0.000	Statistically significant (p<0.05)

Hypothesis

- **Null Hypothesis (H0):** There is no significant relationship on an individual's motivation, experience, and interest in pursuing entrepreneurship.
- **Alternative Hypothesis (H1):** There is a significant positive relationship on an individual's motivation, experience, and interest in pursuing entrepreneurship.

	EEI	FBB	ASE	FSP	PI	ESE	ATE	EIS	RTP
EEI	1								
FBB	0.621	1							
ASE	0.704	0.773	1						
FSP	0.688	0.727	0.695	1					
PI	0.725	0.729	0.708	0.828	1				
ESE	0.761	0.758	0.740	0.804	0.857	1			
ATE	0.731	0.792	0.778	0.736	0.786	0.904	1		
EIS	0.650	0.677	0.543	0.745	0.690	0.648	0.691	1	
RTP	0.708	0.804	0.760	0.748	0.669	0.765	0.806	0.722	1

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One Way Anova

Analysis of variance (ANOVA) is a statistical test used to evaluate the difference between the means of more than two groups. This statistical analysis tool separates the total variability within a data set into two components: random and systematic factors. A one-way ANOVA uses one independent variable.

Hypothesis

- **Null hypothesis (H0):** There is no significant difference in the entrepreneurial interests among with students across different demographic categories (Age, Gender and Designation).
- **Alternative Hypothesis (H1):** There is a significant difference in the entrepreneurial interests among with students across at least one demographic category (Age, Gender and Designation).

Demographic Factor	Source of variation	Sum of squares	df	Mean Square	F-statistic	P-Value	Statistical Decision
Age	Between groups	130926.520	27	4849.130	-	-	(not significant)
	Within groups	0.000	272	0.000	-	-	(not significant)
Gender	Between groups	5.811	27	0.215	0.846	0.689	Fail to reject H0
	Within groups	69.175	272	0.254	-	-	(not significant)
Designation	Between groups	1.106	27	0.041	0.959	0.527	Fail to reject H0
	Within groups	11.624	272		-	-	(not significant)

Chi Square Test

The Chi-Square Test of Independence is a non-parametric statistical reach tool employed to determine whether there is a significant association between two categorical variables.

Hypothesis

- **Null hypothesis (H0):** There is no significant association between difference in the entrepreneurial interests among with students across different demographic categories (Age, Gender and Designation).

- **Alternative Hypothesis (H1):** There is a significant association between difference in the entrepreneurial interests among with students across different demographic categories (Age, Gender and Designation).

Statistical Metric	Value
Chi-square Statistic	50.860
Degrees of Freedom	54
P- value	0.596
Significance Level	0.05
Critical Value	72.15
Hypothesis Decision	Reject H0

Discussion

The findings of the study provide meaningful insights into the entrepreneurial interest of engineering students and the factors influencing their inclination toward startup ventures. The results indicate that a majority of students exhibit a positive attitude toward entrepreneurship, reflecting a growing shift from traditional job-oriented careers to more independent and innovation-driven paths. This trend highlights the increasing relevance of entrepreneurship in today's dynamic economic environment.

A key outcome of the study is the significant role of **self-efficacy** in shaping entrepreneurial intention. Students who possess higher confidence in their abilities are more likely to consider starting their own ventures. This suggests that belief in one's capability to handle challenges, take risks, and manage business activities is a crucial driver of entrepreneurial behavior. The finding reinforces the idea that psychological readiness is as important as technical knowledge in entrepreneurship.

The study also emphasizes the importance of **entrepreneurship education** in influencing students' interest. Students who have been exposed to entrepreneurship-related learning experiences demonstrate higher levels of awareness and motivation. However, the effectiveness of such education depends on its practical orientation. The results suggest that theoretical knowledge alone may not be sufficient to encourage students to pursue startups. Instead, experiential learning methods such as real-time projects, case studies, and industry interaction play a vital role in strengthening entrepreneurial intention.

Another important factor identified is **social influence**. Support from family, friends, and peers significantly affects students' career decisions. Positive encouragement enhances confidence and motivates students to explore entrepreneurial opportunities, while lack of support may discourage them from taking risks. This highlights the need for a supportive social environment that recognizes and promotes entrepreneurship as a viable career option.

The study further reveals the importance of **institutional support** in fostering entrepreneurial interest. Students who have access to resources such as incubation centers, mentorship programs, and startup exposure show greater readiness to engage in entrepreneurial activities. Educational institutions play a critical role in creating an ecosystem that nurtures innovation and provides students with the necessary tools and guidance.

Despite the positive inclination toward entrepreneurship, the study identifies a gap between **entrepreneurial intention and actual startup creation**. Many students express interest but hesitate to take action due to barriers such as fear of failure, lack of financial resources, and limited practical exposure. This indicates that while students are interested in entrepreneurship, they require additional support to translate their intentions into reality.

Overall, the findings suggest that entrepreneurial interest among engineering students is influenced by a combination of personal, educational, and environmental factors. Addressing these factors holistically is essential to promote effective entrepreneurial development.

Conclusion

The study aimed to explore the entrepreneurial interest of engineering students and identify the key factors influencing their inclination toward startups. The findings indicate that engineering students possess a strong interest in entrepreneurship, highlighting a shift toward innovative and self-driven career choices.

The study concludes that **self-efficacy, entrepreneurship education, social influence, and institutional support** are significant determinants of entrepreneurial intention. Among these, self-efficacy

plays a crucial role, as students with higher confidence levels are more likely to engage in entrepreneurial activities. Entrepreneurship education also contributes significantly, especially when it focuses on practical and experiential learning.

The findings further emphasize the importance of a supportive environment. Encouragement from social circles and the availability of institutional resources can enhance students' motivation and confidence. However, the presence of barriers such as fear of failure and lack of exposure continues to limit the transition from intention to action.

In conclusion, engineering students have strong entrepreneurial potential, but this potential needs to be supported through effective educational practices, institutional initiatives, and a positive social environment. Bridging the gap between academic learning and real-world application is essential to enable students to successfully transition from campus to company.

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