Proactive entrepreneurial characteristics of science and technology students: an empirical study in Indian context

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In this article we examine the entrepreneurial tendencies among science and technology (S&T) graduates in India. The study was carried out to understand the entrepreneurial psyche among S&T students from India-based institutions of national repute, i.e. Indian Institutes of Technology and National Institutes of Technology. We found that there is a low level of interest among students to pursue an entrepreneurial career. In the psychological context, factors such as self-efficacy, locus of control, innovativeness, achievement orientation were found to positively influence students' entrepreneurial aspirations, but surprisingly not the risk taking propensity. Moreover, environmental factors such as existence of vital resources were found to motivate entrepreneurship. On policy implication *per se*, our finding concludes with suggestions to impart entrepreneurial knowledge through programmes especially designed for S&T graduates. Additionally, in the context of entrepreneurial ecosystem, policy makers can pave new dimensions by creating an environment that serves as a catalyst for high-tech venturing.

Keywords: Entrepreneurial intention, entrepreneurship education, science and technology graduates.

THE very non-linear and non-traditional nature of entrepreneurship has often dumbfounded the logical thinker. Generally speaking, entrepreneurship literature is multifaceted. Gartner's[1] identification of entrepreneurs as individuals with inimitable personality characteristics and abilities, suggests the psychological perspective of entrepreneurship. Ranging from this psychological standpoint, opportunity oriented entrepreneurship philosophy[2,3] argues that entrepreneurial existence is defined by the effectiveness of an entrepreneur's trade with entrepreneurial opportunity identification, assessment and exploitation[4].

On the other hand, resource-based theory hypothesizes amassing particular predictor resources for venture formation. Thus, whether the researcher follows resource-based theory or entrepreneurship theory, the heterogeneity in relative value perception alters a situation, making a simple event an opportunity to a particular individual and mundane to the rest. To explain this phenomenon, scholars often illustrate attributes like entrepreneurial intention, self-efficacy, locus of control, innovation, risk-taking propensity and need for achievement[5–7]. Ambitious models on various entrepreneurial processes, such as entrepreneurial potential[8], new venture initiation[9] and entrepreneurial motivation[10] have been reported.

Throughout human history it has been noticed that technical graduates are more inclined to form companies in dynamic and innovative areas than graduates in any other discipline, thus promoting significant economic growth and increase in employment[11]. In the views of recent public policy makers in India, the promotion of science and technology (S&T) based entrepreneurship has become a theme of highest priority. With advances in technology and information science, entrepreneurial passion among new age S&T students has proliferated, resulting in the implementation of a broad array of entrepreneurial programmes and services to provide a better set-up for new endeavours. Various efforts have been put forward as part of these initiatives, e.g. setting up of incubation centres, entrepreneurship training centres, technology transfer offices and chairs for entrepreneurship in universities, to inspire S&T students to pursue entrepreneurial careers.

However, promoting such entrepreneurship campaigns will become a reality only if the career preferences of S&T students, be it corporate or entrepreneurial are known as the students' career-choice for entrepreneurship is profoundly affected both by personality traits and contextual founding conditions. Thus, if the choice of S&T students to pursue an entrepreneurial career is based on contextual conditions, then the policy makers can commendably improve the situation for new venture formation by changing the context involving economic, legal, political, social, infrastructure conditions and prominently the entrepreneurial education system. However, if the choice of career is based on the personality of students, it is difficult unless the initiatives taken by policy makers are enduring. Thus to assess the antecedents of entrepreneurial intention among S&T students, it is important to answer dilemmas such as: What is the level of entrepreneurial intention among Indian S&T graduates?

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What are the factors most significantly affecting entrepreneurial intention among S&T students? While finding an answer to the above mentioned questions, this study enriches our understanding of the mindsets of current generation S&T students in India and their entrepreneurial intent. Also the study supplements research gaps in entrepreneurial research in a more generalized way.

Theoretical background and hypothesis

With the rise of globalization in the world economy, international competition has multiplied in recent decades. This has ultimately resulted in increasing disappointment with the traditional occupations in large companies. This dissatisfaction has increased the desirability for self-employment[12]. Consequently, a good number of S&T students both in the global arena and even in Indian context often give up on the luxurious paycheck from big multinationals for the sake of founding his or her own company. The most persuasive arguments that these graduates put forward is their need for independence, personal goals, self-realization and commitment to bring about new changes. A survey, conducted by Karr[13] on USA students, shows that 46% of college students consider their own business as a good opportunity to get ahead. Similarly, a study on Norwegian students claimed that 43% of graduates preferred self-employment as their first career choice[12]. Such an overwhelmingly positive claim was refuted by Wang and Wong[14] on science and engineering graduates from Singapore. With Singapore's rapid economic development and high demand for manpower, the well-educated generation typically prefers jobs in large corporations rather than self-employment.

Various personal characteristics, cognitions and social conditions affect an individual's choice to pursue entrepreneurial activities[15]. Entrepreneurial intention scholars have strived to draw models that determine how beliefs, attitudes and perceptions make certain individuals better understand the feasibility of a new opportunity and feel confident that they are able to start their own business[16]. Ajzen[17] confirmed that attitudes explain over 50% of the variance in intentions, which in turn explains 30% or more of the variance in behaviour. Furthermore, effort to streamline founders' beliefs, perceptions and motives to explain individual differences in perceived desirability and feasibility to start a business and gained considerable value[18] (Figure 1).

Though not only psychology, even sociology at large influences the intention to become an entrepreneur. Sociology theory stretches from socio-cultural to economic and legal affairs of a nation, factors in societal attitude towards entrepreneurship and finally to the availability of funds or the existence of small business incubators[19]. Exogenous factors like gender, family background, race, nationality and educational performance increase alertness to opportunities[14] and impact emotional chemistry between the individual and particular opportunity. Such a theoretical claim was confirmed when a multicultural study in USA, Asia, and Scandinavia, specifically for S&T graduates, found that entrepreneurial career preferences are influenced by the image of an entrepreneur in the social context of a particular country and the support received from the university[20].

At individual level, values, attitudes, motivations and personality traits influence individuals towards forming entrepreneurial intentions. To explain this phenomenon, entrepreneurial intention researchers took references from the Theory of Planned Behaviour[17,21] and the Model of Entrepreneurial Event[19], and combined it with the principal elements of the Theory of Social Learning and Self-Efficacy[22]. For social dimensions like political and economic a tendency towards a sense of social support, resources, perception of opportunities[16] and subjective norms[17] contribute to the formation of entrepreneurial intention.

The objectives of this study have been (a) attaining a deeper understanding about the perception of entrepreneurship as a career option among young S&T students in India, (b) comprehending the students' psychological bent of mind on entrepreneurship with a tint of environmental influence. Since only the views of S&T students toward entrepreneurship were under consideration, so principally, we focused on psychological dimension along with a controlled measure of the students' perception about the importance of vital resources. Because a detailed measurement of the impact of environmental resources on entrepreneurial intention formation requires other stakeholders', views namely, educationists, policy makers, professors, etc. are inadvertent in this study. Thus, the variables under study, focused on specific personality traits: self-efficacy, locus of control, innovativeness, risk-taking propensity, achievement orientation, and existence of required resources and their relation to the entrepreneurial intention formation.

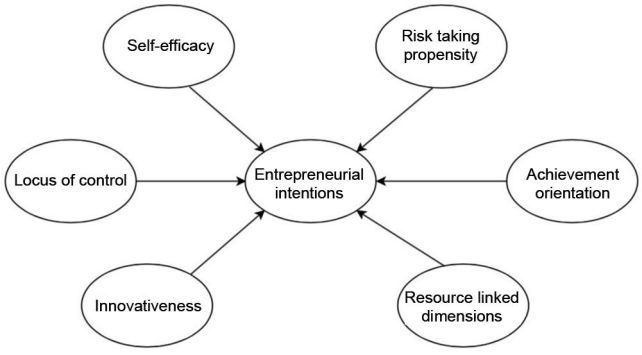

Figure 1. A conceptual model of the entrepreneurial decision process.

Self-efficacy

Self-efficacy is a strong predictor of performance in stressful tasks that an individual rarely performs. Historically, self-efficacy and entrepreneurship have always had a strong positive interaction. In the tempestuous field of entrepreneurship, self-efficacy resonates an individual's coping behaviour and sustenance in the face of complications and hostile experiences. Self-efficacy is often found to affect motivations at individual level, and plays an important role in defining intentions. Additionally, a higher level of cognition allows an individual to perceive important risks and constraints in the system while pursuing entrepreneurship. Hence, in the script of entrepreneurial opportunity finding, self-efficacy takes the centre-stage and defines the personal predisposition to act on an opportunity. Accordingly, we follow with this hypothesis.

Hypothesis 1: S&T students with high level of self-efficacy are more entrepreneurially intended.

Locus of control

Binaries in the locus of control bifurcate a population into two groups, one with internal locus of control and another with external locus of control. Individuals with higher internal locus of control exercise higher levels of self-efficacy. Hence such individuals achieve and accomplish more with their personal abilities and efforts[23]. Whereas individuals with external locus of control believe in uncontrollable factors such as God, powerful people and fate. High external locus of control results in risk aversion and low initiative[24], and causes fear of failure about the new venture because individuals with external locus of control perceive 'beyond control' nature of outcome[25,26].

Thus our second proposal:

Hypothesis 2: S&T students with high level of internal locus of control are more entrepreneurially intended.

Innovativeness

Innovativeness is one of the most distinctive characteristics of entrepreneurial spirit and has been the theme of a plethora of entrepreneurship literature[27–30]. The association between entrepreneurial psyche and innovation is historic and undeniably pristine for generations to come. But innovativeness does not always result in economic success (Leibnitz's idea to dig up the Suez Canal had no impact either on his personal economic gain throughout his life time or on the economic history for the subsequent two hundred years)[31]. It is market-oriented innovativeness that defines an entrepreneur. The above discussion leads to the next hypothesis.

Hypothesis 3: S&T students with high level of innovativeness are more entrepreneurially intended.

Risk taking propensity

An individual's proclivity to preserve an effort where returns could be inexact, reflects his/her level of risk taking propensity. Again risk taking is expressed either as a probability function or as an individual disposition towards risk[32]. Various studies have shown the inordinate amount of risk an entrepreneur unfailingly faces, and cites risk taking propensity as an irrefutable characteristic of entrepreneurial intention[33–36]. In addition, Bird[37] splits the potential risk into financial, opportunity cost for career development, and extended up to family and social front. Based on the above discussion we propose the following hypothesis.

Hypothesis 4: S&T students with high level of risk-taking propensity are more entrepreneurially intended.

Achievement orientation

Need for achievement or achievement orientation, a concept that began in the 1950s still found its presence as a prominent personality trait of entrepreneurial individuals[38]. Henceforth, achievement orientation as an entrepreneurial variable is used significantly to sketch the psychographic profile of an entrepreneur[28,39,40]. Individuals with higher need for achievement are found to have a strong motivation to overcome interferences[41,42]. It is not always extrinsic success or rewards that incite individuals with higher need for achievement to undertake a challenging job. Many a time it is the sense of intrinsic success of having direct control over outcomes or events that make them realize how their efforts affect the outcomes of a given event[39]. Therefore, we predict that

Hypothesis 5: S&T students with high level of achievement orientation are more entrepreneurially intended.

Vital resources

The history of economic development quite categorically emphasized that it is not only personal characteristics such as human values, motivations, attitudes, etc. and psychological dimensions described above, but also social factors like political, economic, environmental support, subjective norms, perception of opportunities, recognition of opportunities and also the existence of vital resources to exploit[2,17,43], predispose individuals toward entrepreneurial intention formation[44]. Through the resource-based views of entrepreneurship, scholars[45–48] validate the importance of essential resources. Henceforth, entrepreneurship consists of an integrated process

where personal characteristics like self-efficacy, locus of control, innovativeness, risk-taking propensity and achievement orientation synchronize with an individual's cognitive process to identify and manipulate attractive resources so as to seize opportunities to generate profit. Thus, we hypothesize that

Hypothesis 6: S&T students with better access towards vital resources are more entrepreneurially intended.

Methodology and statistical test

Results of descriptive statistics

We followed a questionnaire survey method and collected data from various regions spread over eastern India. A four-member panel, consisting of experts in the field of entrepreneurship, marketing, psychology and economics was formed for questionnaire review on content validity. We followed a rigorous pre-test involving 40 students spread over different engineering and technology disciplines to validate the instrument. The target population included students pursuing four-year bachelors degree in engineering (B. Tech), two-year masters degree in engineering/science (M. Tech), and Ph D in engineering/science from premier institutes such as the Indian Institutes of Technology (IITs) and National Institutes of Technology (NITs). Constrained by resources such as time and geography (only 23 IITs and 31 NITs spread over all India), we picked 3 IITs (IIT-Kharagpur, IIT-Patna and IIT(ISM)-Dhanbad); and 3 NITs (NIT-Durgapur, NIT-Jamshedpur and NIT-Patna), located in the eastern part of India.

Out of 273 responses, the survey yielded 245 ready to use responses, i.e. 89.74%. We confirmed to the students that the survey was for an academic purpose. Hence their responses would be confidential and filling up the questionnaires was voluntary. Since our data was predominantly collected from students at IITs and NITs with an engineering and science background, a lower representation from female students is not very peculiar. Institutes like IITs and NITs are notoriously famous for skewed sex ratios, with a male-to-female ratio of 10 : 1 for undergraduate engineering courses. Table 1 gives the details of the demographic profiling.

Results of factor analysis

We implemented exploratory factor analysis (EFA) with varimax rotation for dimension reduction along with principal component analysis where the number of retained factors was classified by total variance explained. Five factors were derived from nineteen items considered to be dealing with psychological construct, viz. self-efficacy, locus of control, innovativeness, risk-taking propensity and achievement orientation. Similarly, three items corresponding to environmental constructs were condensed in one factor and the remaining three items dealing with entrepreneurial intention were abstracted in a single factor (Table 2).

A convincing KMO (Kaiser-Meyer Olkin measure of sampling adequacy) measure of 0.808 and eigen-value more than one for each factor along with the sum of total variance explained, 76.705%, approves the suitability fit for factor analysis[49,50]. Again factor loading ranging, lowest from 0.546 to highest 0.938, with Bartlett's test of sphericity measure (3455.229 with 231 df, $P < 0.001$), confirms correlation among various attributes of different constructs, thus permitting factor analysis.

Table 3 represents the factor analysis result for the variables under consideration, linked to intention dimension. A KMO measure 0.717 and Bartlett's test of sphericity result (259.631, d$f = 3$, $P < 001$), confirms basic norms. The model explained 73.682% of the total variance.

Results of validity and reliability analysis

The survey instruments consisted of eight items namely, demography, entrepreneurial intention, self-efficacy, locus of control, innovativeness, risk-taking propensity, achievement orientation and vital resources. While designing the questionnaire we adopted recognized items from entrepreneurial literature[51–57]. Students were asked to specify their responses on a five-point Likert scale except for the demography segment.

Table 4 illustrates the result of confirmatory factor analysis (CFA) to measure the convergent validity. All

Table 1. S&T students' demographic profile

Dimensions	Particulars	Percentage
Age	Mean: 23.64	–
	Standard deviation: 2.68	–
Gender	Male	81.22
	Female	18.78
Religion	Hindu	84.08
	Muslim	09.38
	Christian	02.85
	Others	03.69
Caste	General	52.65
	OBC	28.57
	SC	13.87
	ST	04.91
Marital status	Single	95.91
	Married	04.09
Family type	Nuclear	64.08
	Joint	35.92
Professional experience	Freshman	79.68
	Job experience	20.32

Table 2. Dimension reduction for psychological and resource linked variables

Construct	Item	Eigenvalue
Self-efficacy	I must believe in my ability to persevere in spite of all indications that failure is imminent I can persist in the face of adversity I can handle the situations that life brings I often feel that there is nothing I can do well[R] I can identify and build management teams	5.278
Achievement orientation	I do not like a well-paid job if I cannot derive a sense of achievement and satisfaction from it. I do my best work even when my job assignments are fairly difficult I do not mind routine, unchallenging work if the pay is good[R] I want to earn only as much as possible to attain a comfortable way of life[R]	3.348
Locus of control	I cannot wait and watch things happen; I prefer to make things happen It is not luck or fate, but my own action determine my life I do not enjoy outcomes, no matter how favourable, if they do not stem from my own efforts. When I get what I want, it is because I am lucky[R]	2.579
Risk taking propensity	My decisions are always made carefully and accurately[R] I follow the motto, 'nothing ventured, nothing gained' I can handle big losses and disappointments with little difficulty	2.394
Innovation	I often surprise people with my novel ideas I believe there are always new and better ways of doing things. I am able to get around difficulties through strokes of ingenuity and resourcefulness	1.871
Vital resources	I feel, I will have access to necessary vital resources I feel my government will support my venture I feel there is a pro-venture ecosystem exist in my economy	1.405

Table 3. Dimension reduction for intention linked variables

Construct	Item	Eigen value
Entrepreneurial intention	I am ready to do anything to be an entrepreneur I have a very low intention of ever starting a business[R] Being an entrepreneur would give me great satisfaction	2.210

results sufficed the rules of thumb mentioned[58]: (a) Factor loadings should range between >0.5 and <0.95; (b) composite reliabilities (CR) value should be ≥0.06; and (c) average variance extracted (AVE) value should be ≥0.05.

Similarly, in Table 5 all the diagonal elements of the matrix surpassed the inter-construct correlations. This confirms the discriminant validity of the instruments.

Entrepreneurial intention

While measuring the intention to pursue an entrepreneurial career and creating a new venture, we adopted multiple items consistent with prior literature[54]. The questions adopted in this instrument are meant to unearth the S&T students' intention to start their own venture. The five-point Likert scale measured the level of agreement and disagreement-1 ('strongly disagree') to 5 ('strongly agree'). The internal consistency of items measuring the underlying construct was above the recognized level (Cronbach's alpha = 0.820).

Psychological constructs

Items used to measure psychological dimensions were adopted from previous studies[55–57]. With variables defined on the psychological aspect, contributors were asked to evaluate multiple items. Options to answer each item followed Likert's scale, and students responded with scores-1 ('strongly disagree') to 5 ('strongly agree'). On reliability aspect, the scale showed consistency for each variable mentioned above (self-efficacy, $\alpha = 0.912$; locus of control, $\alpha = 0.845$; innovativeness, $\alpha = 0.813$; risk-taking propensity, $\alpha = 0.918$; achievement orientation, $\alpha = 0.820$).

Vital resources

To prepare this part of the questionnaire, we intervened with mechanisms, such as exploratory interview and group discussions. The participants came from different strata of academics – ranging from prominent faculty members, programme directors of entrepreneurship

Table 4. Construct reliability and convergent validity

Construct	Item	Factor loading	Composite reliability (CR)	Average variance extracted	Cronbach's alpha
Self-efficacy	Self_1	0.909	0.915	0.687	0.912
	Self_2	0.907			
	Self_3	0.869			
	Self_4	0.794			
	Self_5	0.726			
Achievement orientation	Achi_1	0.868	0.825	0.550	0.820
	Achi_2	0.855			
	Achi_3	0.780			
	Achi_4	0.598			
Locus of control	LOC_1	0.904	0.851	0.593	0.845
	LOC_2	0.841			
	LOC_3	0.824			
	LOC_4	0.546			
Risk-taking propensity	RTP_1	0.938	0.919	0.792	0.918
	RTP_2	0.925			
	RTP_3	0.907			
Entrepreneurial intention	EI_1	0.856	0.822	0.606	0.820
	EI_2	0.856			
	EI_3	0.824			
Innovativeness	Inno_1	0.856	0.821	0.608	0.813
	Inno_2	0.854			
	Inno_3	0.737			
Vital resources	RLD_1	0.837	0.796	0.565	0.794
	RLD_2	0.815			
	RLD_3	0.788			

Table 5. Analysis of discriminant validity

	Innovativeness	Self-efficacy	Achievement orientation	Locus of control	Risk taking propensity	Intention	Vital resources
Innovativeness	0.780						
Self-efficacy	0.287	0.829					
Achievement orientation	–0.011	0.125	0.742				
Locus of control	0.112	0.198	0.313	0.770			
Risk taking propensity	0.014	0.112	0.043	0.123	0.890		
Intention	0.035	0.380	0.216	0.225	–0.028	0.779	
Vital resources	0.442	0.062	0.161	0.016	0.059	0.230	0.752

development centres and students. We applied the same designing techniques with each item following a five-point Likert-type scale ranging with scores-1 ('strongly disagree') to 5 ('strongly agree'). Cronbach's alpha ($\alpha = 0.794$) registered the internal consistency of items measuring the underlying construct.

Results of dependent variable

The intention to set up a new venture, i.e. entrepreneurial intention or motivation has long been an important dimension defining the dependent variable and cited in no less than 35% of existing literature on entrepreneurship[59]. Ajzen[21] emphasized 'intention' as a planned behaviour, which can predict actual behaviour and mirror the founders' desire to create a new venture. From a student's point of view, career intention indicates his or her perspective towards entrepreneurship and eventually the actual entrepreneurial or non-entrepreneurial behaviour.

In our study, students pursuing B Tech showed slightly more inclination to follow an entrepreneurial career after graduation compared to students pursuing M Tech and Ph D. Peculiar results were from Ph D students, we found that more number of students (23.86%) having very low intention compared with the number of students having low intention (19.56%). Not surprisingly, in the Indian context, where very few Ph D students want to be

Table 6. Intention towards having an entrepreneurial career

Degree pursuing	Very low (%)	Low (%)	Moderate (%)	High (%)	Very high (%)
Bachelor of technology	7.69	23.07	50	15.38	3.84
Master of technology	19.29	21.05	44.35	12.28	3.01
Ph D	23.86	19.56	45.65	8.26	2.6

Table 7. Results of multiple regression on entrepreneurial intention

	Unstandardized coefficients		Standardized coefficients		
Model	B	Std. error	Beta	*t*	Sig.
(Constant)	0.452**	0.156		2.906	0.004
Self-efficacy	0.313**	0.022	0.494	14.356	0.000
Locus of control	0.218**	0.021	0.352	10.551	0.000
Innovativeness	0.148*	0.072	0.245	2.050	0.041
Risk-taking propensity	–0.148	0.031	–0.163	–4.813	0.060
Achievement orientation	0.170**	0.029	0.196	5.884	0.000
Vital resources	0.159*	0.076	0.253	2.104	0.036
F-statistic	115.767				
R^2	0.745				
Adjusted R^2	0.738				

$N = 245$, $*P < 0.05$, $**P < 0.01$.

self-employed, we found only one in forty Ph D students likely to ever own an organization (Table 6).

In all three categories the maximum number of students, B Tech (50%), M Tech (44.35%) and Ph D (45.65%) were equivocal as to whether they have any future entrepreneurial plans. The findings substantiate that there is not much of a positive tendency towards being entrepreneurial among students pursuing various degrees at institutions of national importance such as IITs and NITs. Assigning entrepreneurial intention as a precursor of actual entrepreneurial behaviour, our research design had literature support from earlier studies[60–63].

Results of multivariate analysis

For further investigation on the inter-relational dynamics between dependent and independent variables, and to test the six hypotheses in a multivariate setting, we implemented bivariate correlation and multiple regression analysis with the help of SPSS 23. According to our conceptual model, entrepreneurial intention to set up a venture has been accorded with the role of dependent variables and various psychological and environmental factors signify the six independent variables. The multicollinearity issues has often been a matter of serious concern. In our study, the inter-factor correlations range from 0.442 to 0.011. Thus, no instances of correlation above 0.70, between the predictor variables, confirm non-multicollinearity[64].

Further, to test the magnitude of the effect of various psychological traits and environmental characteristics on the changes in level of entrepreneurial intention among S&T graduates, we used multiple regression analysis. The regression model was run to test the hypothesis. In the main effect model, the dependent variable, i.e. intention to venture formation was regressed on six independent variables, viz. self-efficacy, locus of control, innovativeness, risk taking propensity, achievement orientation and vital resources (Table 7).

Consistent with hypothesis 1, the regression analysis result ($b = 0.494$, $p < 0.01$) confirmed that there has been a positive effect of self-efficacy (independent variable) on the intention to be entrepreneurial (dependent variable). Simultaneous multiple regression shows strong linear (positive) relationship between entrepreneurship intention and other independent variables, such as locus of control ($b = 0.352$, $p < 0.01$), innovativeness ($b = 0.245$, $p < 0.05$), achievement orientation ($b = 0.196$, $p < 0.01$) and vital resources ($b = 0.253$, $p < 0.05$). Thus, all our accepted hypotheses, i.e. self-efficacy, locus of control, innovativeness, achievement orientation and vital resources had a positive effect on students' entrepreneurial intention formation. One hypothesis failed in the regression test and was rejected, i.e. H4. Such finding is rather peculiar and we will confer on this issue in the next section.

The R^2 value (0.745) indicates that 74.5% of the variability in entrepreneurial intention is explained by independent variables which demonstrate a strong association. The adjusted R^2 (addition of an extra independent variable to the model results in a marginal change in R^2) value of 0.738 and the F-statistic (115.767, $P < 0.01$) shows that the model is a good fit to understand the dependency of psychology and environment-related factors on entrepreneurial intention.

Discussion

With the research question: to what extent does the entrepreneurial intention towards venture creation among S&T graduates in India is influenced by the individual psychological characteristics and environmental factors? We derived the answer to this question, based on the survey conducted on 245 Indian students pursuing undergraduate, post-graduate and Ph D degrees in various S&T streams. With theoretical support from prior literature, the expected effects of psychological and environmental factors on entrepreneurial intention obtained general support from the actual outcomes of the analysis.

Hypothesis 1, on self-efficacy, was found to be statistically significant, and hence was accepted. Results of the regression analysis showed that self-efficacy was the most significant psychological factor. Our finding on the relationship between self-efficacy and entrepreneurial intention also resembles prior literature[43]. Thus, students reporting higher level of self-efficacy are found to have a strong intention to own a venture. Hypothesis 2, which defines the relationship between locus of control and entrepreneurial intention, was accepted from regression analysis. With a positive co-efficient value of 0.352, locus of control as a psychological trait was found to be positively associated with entrepreneurial intention. Our finding here follows Lüthje and Franke[60], where they compared entrepreneurial intention among MIT and two other European university students.

Hypothesis 3, which was designed based on the association between innovativeness and entrepreneurial intention, registered its acceptance from the regression analysis. Innovativeness has been a critical focal point of entrepreneurial research for a long time. With a positive beta co-efficient, our analysis follows the same pattern that was found in a study on Hong Kong based MBA students[51]. The result from regression analysis on hypothesis 4 confused us because most of the earlier findings have shown a positive association between risk-taking propensity and entrepreneurial intention[51,65]. A recent study on university students in Singapore disconfirmed the positive association between risk and entrepreneurial intention and argued that such findings may actually be because of low rate of participation of talented graduates in starting a business[14]. A similar argument may be made, as our data set is from premier technology institutes in India, which assure its graduates of well compensated jobs and rewarding careers in multinational corporations.

Hypothesis 5 was accepted on the basis of the regression analysis result. Here we hypothesized a positive relationship between achievement orientation and entrepreneurial intention. The regression analysis was documented with a beta co-efficient of 0.196, indicating the strength of the association. This finding confirms that stronger the influence of achievement orientation in any student, higher the chances that he or she will pursue an entrepreneurial career. Our deduction here finds its literature support from Koh's study[51].

Hypothesis 6 is based on the association between environmental factors and entrepreneurial intention. It is not only the psychological traits that define a student's intention to look for entrepreneurial opportunities, but the socio-economic environment has its fair share. We accept H6 from regression analysis. Although the co-efficient has a relatively lower positive value, our finding follows Bandura's comment that there are reciprocal causal links existing between the person, environment and behaviour[66]. On empirical settings, we found similar results[60].

Conclusion

The paper, through empirical inspection, envisioned to observe the entrepreneurial psyche of young talented students pursuing undergraduate, post-graduate and Ph D degrees in S&T at premier institutes in India. The study was focused on driving two outcomes: (a) level of entrepreneurial intention among young engineers; (b) factors influencing entrepreneurial intention.

First, the entrepreneurial interest among students studying at IITs and NITs ranks way below their western counterparts. Studies in USA show higher levels of entrepreneurial interest among students from MIT and other top universities. But the patterns are quite similar; the more degrees you earn, the less entrepreneurial you become, i.e. undergraduate students are more entrepreneurial than post-graduate students, and post-graduate students are more entrepreneurial than Ph D students.

Secondly, to assess the interaction – we hypothesized entrepreneurial intention as a dependent variable and measured the influences of psychological and environmental factors on the formation of intention. Our test results predominantly followed global standards, i.e. positive relationship between entrepreneurial intention and self-efficacy; locus of control; innovativeness; achievement orientation; and resources. The association between risk and intention showed an inverse nexus.

Several implications were drawn from the findings on behalf of technology institute educators and supervisors. The existence of low entrepreneurial interest indicates a higher need for entrepreneurship courses especially designed to target S&T students. The course contents need to attempt in accelerating the risk-taking propensity among students. Entrepreneurship is all about taking calculated risks. Hence, students can be trained with the upside prospects of venturing, by using native businessmen as role models and also through in-depth review of their success stories.

Learning from the recent economic crisis, and aspiring to be a global tech-hub, the Indian Government's start-up India Action Plan (2016) has stressed on fostering homegrown high-tech start-ups. From the policy maker's point

of view, to promote such ambitious high-tech start-ups, they first need to address the issue of entrepreneurial interest among technically proficient university graduates. Indeed, the Indian government's recent policy measure (Atal Innovation Mission) is exclusively devised to make a significant change in the direction of techno-preneurship. Such initiatives will eventually result in relaxation of bankruptcy laws, changes in taxation, and reduced patent costs. Many such incentives for new venture will attract highly talented young graduates to pursue an entrepreneurial career for a relatively risky but potentially gratifying future. We conclude with suggestions for policy makers to emphasize on issues like socio-economic factors (education, governance and institutional capacity and infrastructure), which contribute to entrepreneurial awareness formation, attenuate perceived risk of failure and eliminate red-tape bureaucracy and opportunity cost of entrepreneurship.

Future research can find new directions from the present study. One direction could be a faculty-wise comparison at the same degree-level. In the current study, we surveyed students with engineering and science background, irrespective of their faculties. One could also study in greater depth, as to whether there exist any dissimilarities in start-up intention level among different strata of social class of students from the same faculty or same institute. It would be interesting to study whether students from the management faculty have higher entrepreneurial propensity than students from the S&T faculty.

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