

**International Journal of Enterprise Network Management**

ISSN online: 1748-1260 - ISSN print: 1748-1252

<https://www.inderscience.com/ijenm>

---

**Understanding the interaction among motivators of entrepreneurial aspiration of university students in India**

Amit Kumar Agrawal, Vanchan Tripathi, Pravin Kumar Bhoyar

**DOI:** [10.1504/IJENM.2023.10055885](https://doi.org/10.1504/IJENM.2023.10055885)

**Article History:**

Received:	19 June 2021
Last revised:	07 November 2021
Accepted:	26 November 2021
Published online:	06 May 2023

---

## **Understanding the interaction among motivators of entrepreneurial aspiration of university students in India**

---

**Amit Kumar Agrawal\***

Department of Management and Business Informatics,  
International Institute of Information Technology,

Naya Raipur, Chhattisgarh, India

Email: amitag@iiitnr.edu.in

\*Corresponding author

**Vanchan Tripathi**

IMS – Ghaziabad,

University Courses Campus,

Ghaziabad, Uttar Pradesh, 201015, India

Email: vanchan.tripathi@gmail.com

**Pravin Kumar Bhojar**

Symbiosis Institute of Management Studies (SIMS),

Symbiosis International University, Pune,

Pune, 411020, India

Email: pravink@sims.edu

**Abstract:** This paper aims to study the motivators of entrepreneurial aspiration of university students in the Indian scenario. The authors identified 12 motivators through an extensive literature review and an expert survey. This study adopted the interpretive structural modelling (ISM) technique to assess the interrelationship among the various motivators of entrepreneurial aspirations in the context of university students in India. The present study suggests that strong self-efficacy, need for achievement and entrepreneurship education are the prime motivators of entrepreneurial aspiration among university students in India. On the other hand, high motivation, propensity to create new business, entrepreneurship funding, and entrepreneur identity creation are the dependent motivators and enjoy high dependence and weak driving power. This study provides valuable insights to policymakers and universities on ways to focus on variables that are deemed critical for developing entrepreneurial aspirations among students.

**Keywords:** entrepreneurial aspirations; interpretive structural modelling; students; university; India.

**Reference** to this paper should be made as follows: Agrawal, A.K., Tripathi, V. and Bhojar, P.K. (2023) 'Understanding the interaction among motivators of entrepreneurial aspiration of university students in India', *Int. J. Enterprise Network Management*, Vol. 14, Nos. 1/2, pp.99–121.

**Biographical notes:** Amit Kumar Agrawal is currently serving as an Assistant Professor in the Department of Humanities and Management, Dr. S.P. Mukherjee International Institute of Information Technology, Naya Raipur, India. He has obtained his PhD from the Department of Management Studies, Indian Institute of Technology Roorkee.

Vanchan Tripathi is an Assistant Professor at the Department of Management in IMS University Courses Campus and specialises in the area of human resource management and organisational behaviour. She holds a first-class Master's in Human Resource Management and has around 11 years of teaching experience.

Pravin Kumar Bhojar is an Assistant Professor in the area of Marketing and Entrepreneurship with the Symbiosis Institute of Management Studies since 2005 and in-charge of Centre for Corporate Governance and Centre for Entrepreneurship. He completed his PhD from the Symbiosis International University, Pune in Rural Marketing.

This paper is a revised and expanded version of a paper entitled 'Understanding the interaction among motivators of entrepreneurial aspiration of university students in India' presented at International Conference on Dynamic Business Environment: Challenges & Opportunities in the New Normal, IMS Ghaziabad, 5–6 February 2021.

---

## 1 Introduction

“An entrepreneur is one who creates a new business in the face of risk and uncertainty for the purpose of achieving profit and growth by identifying significant opportunities and assembling the necessary resources to capitalize on them” [Sanyal and Hisam, (2008), p.1]. The transformational journey of an individual into an entrepreneur encompasses various steps. These steps include identifying the entrepreneurial opportunities, developing plans to exploit the potential opportunities, effective execution of programs, and incorporating improvement and adjustments in the plans. An entrepreneur should have a strong sense of self-belief to pursue his goals and engage in entrepreneurial activities constantly. Similarly, by their success, entrepreneurs encourage others to take the path of entrepreneurship (Davidsson, 2006). Several drivers push an entrepreneur to take that risk. Understanding what motivates individuals to follow the path of entrepreneurship is the critical question in this field of study (Shane and Venkataraman, 2000; Pfeifer et al., 2016).

Aspirations are long referred to as the aim, ambition or the longings still not achieved. These aims and ambitions define how we would move, act and see our self in life. Stressing upon the innate spirit of enterprise lying within an individual as a strong motivational force, Farmer et al. (2011) insists on self-efficacy as a powerful pre-cursor behind the entrepreneurial spirit. Morrison (2000) emphasise that factor such as personal, intuitional, cultural background plays a significant role in the entrepreneurial aspiration of a person.

Extant literature on entrepreneurship in recent times has focused explicitly on the environmental surroundings of an entrepreneur and opportunities revolving around it (Aldrich, 2000). Constant focus on environment and opportunities has resulted in

negligence of personal traits of an entrepreneur, which plays a vital role in influencing the decision of students to turn in an entrepreneur (Carroll and Mosakowski, 1987). Understanding the importance of personal traits as essential predictors of entrepreneurial aspirations, Shane et al. (2003) and Aldrich and Zimmer (1986) has called for further research to understand the role of various predictors in fuelling the entrepreneurial aspirations of students

Today, universities are emerging as a platform for students to avail funds, create their ventures, and integrate ethics and values to run business in the long run (Rasmussen and Borch, 2010; Van Der Merwe et al., 2008). Hence, entrepreneurial aspirations of students require persistent efforts, defining of goals, and intention (Shane et al., 2003). In forthcoming times, universities have to play an essential role in enhancing the entrepreneurial aspirations amongst the students through the delivery of proper education, knowledge, skills, and attitude. The undertaking of entrepreneurial activity means following the path of complex decision-making over various activities such as sourcing, vendor selection, and opportunity identification and taking the business forward on the way to success (Wilson et al., 2007). According to Segal et al. (2005), universities help students in developing skills and specialisation for execution of business plans, and enhance their supervisory and persuasion skills.

Various factors motivate entrepreneurial aspirations among university students. These motivators contribute significantly to entrepreneurial outcomes. The quantum of effect is different in the case of other motivators (Hessels et al., 2008). Therefore, it is vital to understand the interrelationship existing amongst various motivators of entrepreneurial aspirations of university students. The objective of this paper is multifold and are as follows:

- To identify the motivators of entrepreneurial aspiration among university students.
- To discover the interrelationship among these barriers.

The rest of the study is structured as follows: First, the study presents an extensive literature review on the entrepreneurial aspirations of university students. Next, we elaborated upon various factors which are essential for enabling entrepreneurial aspirations. Third, we prioritise and develop inter-relationship amongst identified factors. Finally, we present our discussion, conclusion and implications of the study.

## **2 Literature review**

Entrepreneurship helps in job creation, technology enhancement and economic development (Linan and Fernandez-Serrano, 2014). These features of entrepreneurial activities also attracted the interest of the policymakers to develop various policies to increase the entrepreneurial activities in the economy (Kwong and Thompson, 2016). Entrepreneurs attribute multiple factors as a reason to adopt entrepreneurship as a profession (Henley, 2007; Bielli and Bielli, 2008). As per entrepreneurship literature, there are two significant categories of entrepreneurship motivators: personal characteristics and environmental factors (Afutu-Kotey et al., 2017; Gartner, 1989; Ravichandran et al., 2016). Bosma and Harding (2006) suggest various reasons behind individuals' intention behind entrepreneurship could range from perceived business opportunities or the absence of any good work options. On similar lines, state of the art

literature proposes various motivators of entrepreneurial aspirations. These motivators for entrepreneurship aspirations are as follow.

### *2.1 Family background*

According to a study by Sinha (1996), family background is an essential motivator in developing the aspiration of younger entrepreneurs. The family background generally accustoms young entrepreneurs with art and science involved in the process of creating ventures. The social atmosphere students receive from his family helps develop and nourish several ideas and strategies to build the future venture. Gibb (1996) further authenticated that conditioning of a child right through reinforcement of various family roles, cultures and life, right from the beginning, lead to the shaping of entrepreneurial behaviour of the child. Asserting a similar view, Shapero and Sokol (1982) found the role of father and mother is paramount in establishing any kind of entrepreneurial behaviour of an individual.

Deakins and Freel (2009) asserted family background play a crucial role in the life of an entrepreneur. They held that an entrepreneur is more prepared to undertake his entrepreneurial journey if he has earned prior experiences from his family. Also, robust support of family to an entrepreneur creates subs sustenance for his aspirations. Thus, a strong family background emerges as a critical factor in developing entrepreneurship aspirations in any student.

### *2.2 High motivation*

Motivation is the drive that compels individuals to act or perform in a particular manner implied as goal-oriented behaviour (Sprinthall et al., 1994). Hence, motivation constitutes an essential factor in building entrepreneurial aspirations among individuals. A study by Shane and Venkataraman (2000) argue on differences in motivational level and their influence on the entrepreneurial aspirations of students. Further, their study found that entrepreneurial decisions of students are greatly affected by the perception of risk and opportunities associated with their choices. Emphasising the willingness of an individual to move ahead regardless of whatever odds are present in his path, Palich and Bagby (1995) attributed the high motivation of an entrepreneur as a success factor in their study.

Accordingly, Hessels et al. (2008) found three kinds of motivation for an individual to indulge in any kind of entrepreneurial behaviour: First, opportunities or necessities primarily act as a critical motivator for pursuing entrepreneurial dreams. Second, the cost-benefit approach also serves as an essential motivator behind aspirations to shape into behaviour. Third, entrepreneurial aspirations are also affected by deep psychological motivators. Thus, the high motivation of an individual is a key for nurturing its entrepreneurial aspiration and shaping its behaviour.

### *2.3 Propensity to create new business*

Propensity to create new business is also a crucial determinant behind the aspirations of budding entrepreneurs (Corbett, 2002). According to Kirzner (1995), humans have always strived high to discover opportunities, to create more value. Elaborating further, Venkataraman (1997) and Shane (2000) suggested that prior learning, innovation, knowledge, and events are some of the key pre-cursor for finding new business

opportunities. Various researchers in the past have tried to understand the reasons for the creation of new ventures (Marchesnay, 1998; Daniel, 2006). A critical study by Estay et al. (2013) provides two-prong links between propensities to create new business with entrepreneurial aspiration:

- 1 high intensity for change
- 2 high level of novelty.

Thus, we find a propensity to develop new business has shaped up the entrepreneurial aspiration of an individual for his greater autonomy and satisfaction.

#### *2.4 Strong self-efficacy*

A strong self-efficacy refers to the belief an individual has in accomplishing a task undertaken based on critical resources, competencies and skills possessed (Bandura, 1997; Soto-Acosta, 2008). Self-efficacy is a job-specific concept (Wilson et al., 2007). A high self-efficacy of an individual for any given task means the more significant amount of effort and resources spent by the person in a given period with his ability to absorb setbacks (Rahmati, 2014; Yu et al., 2015). It also runs down to planning, developing, and executing essential strategies to reach their goals or adopt a particular career choice (Wilson et al., 2007). Self-efficacy constitutes a necessary attribute in any entrepreneurial process undertaken, right from creating a new business or venture, facing predictable and unpredictable challenges, and taking decisions to mitigate and move ahead. According to Markham et al. (2002), self-efficacy perception leads to any individual's aspiration to perform entrepreneurial action. However, self-efficacy is affected by various contextual and situational factors such as previous experiences and level of education (Hollenbeck and Hall, 2004). Ajzen (2002) found self-efficacy as the critical building block for stimulating entrepreneurial aspirations and influences the perceived feasibility to start a business (Shaper, 1975). Thus, increasing an individual's self-efficacy means strengthening the student's self-confidence to pursue entrepreneurship activity in the future.

#### *2.5 Individual cultural context*

Individual cultural context is essential in shaping personal aspirations toward entrepreneurship (Vernon-Wortzel and Wortzel, 1997). "To understand the individual, the focus must be on his/her internalized culture versus his/her cultural group membership" [Daya, (2001), p.51]. A cultural institution such as personality traits and societal culture significantly influences individual entrepreneurship initiation. The business environment of a particular country also affects the respective culture (Resmi et al., 2014). These business environments encourage the entrepreneur to undertake new venture creation, which echoes an individual vision and ambitions to realign and review their social background and cultural context (Gordon, 1996). Unique cultural values direct the behaviour of an individual in adopting a particular career choice (Young et al., 2007). According to Linan and Fernandez-Serrano (2014, p.689), "a culture sharing more pro-entrepreneurial values and patterns of thinking would lead to more individuals showing psychological traits and attitudes consistent with entrepreneurship."

## 2.6 *Self-employment*

Self-employment is a particular condition where an individual has to decide between two career alternatives, one as an employee in any organisation and the second as a self-employed (Kolvereid and Isaken, 2006). Perceiving oneself as a business owner defines one's attitude towards self-employment. Further previous research has tried to distinguish between self-employment attitude and self-employment intentions (Kolvereid and Isaken, 2006; Walter et al., 2017). A study by Souitaris et al. (2007) suggests self-employment intentions of students plays a vital role in creating new ventures. However exact relation between the attitudes towards self-employment and entrepreneurial aspiration is hard to establish.

Van Praag and Cramer (2001) found individual decisions to start a business as a tradeoff between expected benefits and salary received through employment. It was further examined empirically by Levesque et al. (2002), who found individual choices as the critical reason behind self-employment or work in an organisation. In their study, Van Praag and Cramer (2001) listed three factors related to self-employment and perusal of entrepreneurial aspiration as perceived desirability, feasibility, and propensity to act.

## 2.7 *Access to resources*

For starting a new business, an entrepreneur requires aspirations and access to resources (Sarasvathy, 2001). An entrepreneur has to obtain different resources and establish trust amongst various partners to turn their dream into reality (Hannan and Freeman, 1984; Delmar and Shane, 2004; Sharma, 2007). A new business venture has to undergo a series of activities such as drawing a business plan, looking out for funds, and recruiting personnel over time (Gartner, 1985). This series of actions results in resource accumulation, defining organisational boundaries, and establishing resource exchange amongst partners (Brush, 2008).

Citing the importance of resource integration, Schumpeter (1934) finds that an entrepreneur has to continuously develop and modify new markets. Further, Stevenson and Jarillo (1990) argued that entrepreneurship is an activity to pursue opportunity even when resources are not readily available or controlled. Thus, students would be more tempted toward entrepreneurship activities if resources were free and readily available, thus fuelling more aspirations amongst the companion students.

## 2.8 *Need for achievement*

Need for achievement has been one of the most researched streams in the entrepreneurship literature. According to McClelland (1965), the need for achievement is the single person logical factor closely associated with new business creation. Murray (1938, p.164) defines the need for achievement as "To accomplish something difficult. To master, manipulate, or organize physical objects, human beings, or ideas; to do this as rapidly, and as independently as possible; to overcome obstacles and attain a high standard; to excel one's self; to rival and surpass others; to increase self-regard by the successful exercise of talent." Extant literature insists that people with a high need for achievement are more likely to indulge in creative and innovative activities with a greater sense of responsibility (Che Embi et al., 2019).

## *2.9 Entrepreneurship education*

Entrepreneurship education plays a critical role in improving the quality and quantity of entrepreneurs in the country (Matlay, 2006). Entrepreneurship education leads to developing other vital skills such as team building and problem-solving (Heinonen, 2007). Previous research has pointed out the critical role of entrepreneurship education in influencing the attitude of university students, their life goals, and their motivation and aspiration in building new startups (Peterman and Kennedy, 2003). Further, the entrepreneurship education of the students also enables desirability to start a new business. In addition, entrepreneurship education has other varied goals such as team learning and goal building, which may help them get positive regards in the new industry, if not instant, maybe in the future (Reynolds, 1993). Entrepreneurship education is a critical driver in developing entrepreneurial attitudes among youth (Kourilsky and Walstad, 1998).

## *2.10 Entrepreneurship funding*

Availability of entrepreneurship funding is one of the most important motivators to inspire new generations to pursue their dreams. According to Hurst and Lusardi (2004), the availability of financial resources helps utilise more significant entrepreneurial opportunities. The importance of capital access is that Ramayah and Harun (2005) designated as the biggest hurdle in entrepreneurship growth. The shortage of funding opportunities is a major dismaying factor for university students in China (Qunlian, 2011; Bhagwat et al., 2008).

Sandhu et al. (2011) found similar results in the case of Malaysian university students. Entrepreneurship funding includes both direct and indirect financing. Direct financing refers to private lending institutions which include venture capital, stocks and bonds, whereas indirect funding refers to bank loans. Due to lack of fixed assets, formidable credit history and equity capital, most university students find it hard to acquire bank loans. Hence venture capital is designated as the most crucial source of funding for budding university startups and entrepreneurs. Therefore, funding occupies such an important position for enabling students to undertake entrepreneurial ventures.

## *2.11 Entrepreneurship environment*

Creating an entrepreneurship environment is believed to enhance entrepreneurship aspirations and feelings (Kuratko, 2005). An entrepreneurship environment is existence and perception regarding opportunities for creating new ventures (Reynolds et al., 1999). Entrepreneurs accomplish success by exploiting these opportunities through their intensive efforts (Qunlian, 2011).

The presence of an entrepreneurial environment in the form of government support, technological and financial support can foster entrepreneurs. Two views on the environment are visible: the environment as extrinsic conditions and the reality created by entrepreneurs through their selective perceptions (Weick, 1979; Starbuck, 1983). According to China's GEM report (Bosma and Harding, 2006), a good business environment is critical for aspiring university entrepreneurs. Hence, enabling improved mentorship and a business atmosphere will positively change university students' entrepreneurship aspirations.



## 2.12 Identity creation

Ireland and Webb (2007) have referred the entrepreneurship process as a means to identity creation. Self-identities have been supposed to drive entrepreneurs for creating new businesses. The concept of identity creation is an individual self-image perceived in terms of economic utility (Akerlof and Kranton, 2000). Thus, identity acts as non-monetary incentives for a person who wants to turn into an entrepreneur.

Expanding the view of Akerlof and Kranton (2000), Falck et al. (2012) insisted on identity as an essential consideration behind the individual who wants to pursue entrepreneurship. Linking passion with identity, Cardon et al. (2009, p.12) describe it as “consciously accessible intense positive feelings experienced by engagement in entrepreneurial activities associated with roles that are meaningful and salient to the self-identity of the entrepreneur.” It means strong identity creation deals with shaping behaviour, which generates a passion for pursuing entrepreneurship. Thus, it is evident that the product of self-identity or possible self- has a strong effect on the entrepreneurial aspirations of startups.

## 3 ISM methodology and model development

The entrepreneurial aspiration of students is a complex issue, and it is understood and analysed by various stakeholders in their manner. Therefore, to understand a complex and ill-defined problem, the complex system’s structure needs to be conceived. Interpretive structural modelling (ISM) identifies and delineates relationships amongst different variables of a complex problem or issue. Warfield (1973) first introduced ISM, later extended by various prominent authors comprising of Sage and Smith (1977), Moore (1987), etc.

ISM helps in determining the hierarchal level of various elements or sub-elements of the complex problem under study. ISM further brings clarity and distinction to mental models of complex systems that are previously unclear and ill-defined (Saxena et al., 2006). ISM is defined as “the systematic application of graph theory in such a way that theoretical, conceptual, and computational leverage is exploited to efficiently construct a directed graph, or network representation, of the complex pattern of a contextual relationship among a set of elements” [Kanungo, (2005), p.2]. Thus, it enables the identification of structure within a complex system consisting of related elements. Matrix or digraph depicts relationship information. Further, ISM also helps illustrate the various levels of the hierarchy of multiple variables, which otherwise often leads to conundrums amongst variables that inform of equality or interventions. Thus, clarity on hierarchal order helps develop a mental model with a well-organised and systematic categorisation of variables.

### 3.1 ISM in literature

ISM techniques have widely been used in many studies to understand the relationship among the variables in interest (Goyal and Kumar, 2017). Various authors(s) have used ISM in the supply chain, marketing, management education, CSR, etc. Table 1 shows the few critical studies from literature with the application of ISM.

**Table 1** ISM in literature

<i>S. no.</i>	<i>Author(s)</i>	<i>The objective of the study</i>
1	Goyal and Kumar (2017)	Barriers to CSR implementation
2	Katiyar et al. (2015)	Measures of supply chain performance
3	Mahajan et al. (2014)	Factors of quality of management education
4	Kumar and Rahman (2013)	Relationship marketing strategies for sustainability adoption
5	Garg et al. (2011)	Factors of customer experience
6	Pfohl et al. (2011)	Supply chain risk
7	Qureshi et al. (2008)	Third-party logistic supplier
8	Singh et al. (2007)	Factors for improving SMEs competitiveness
9	Bolaños et al. (2005)	Modelling of strategic decision-making groups

### 3.2 Hierarchy-based model development

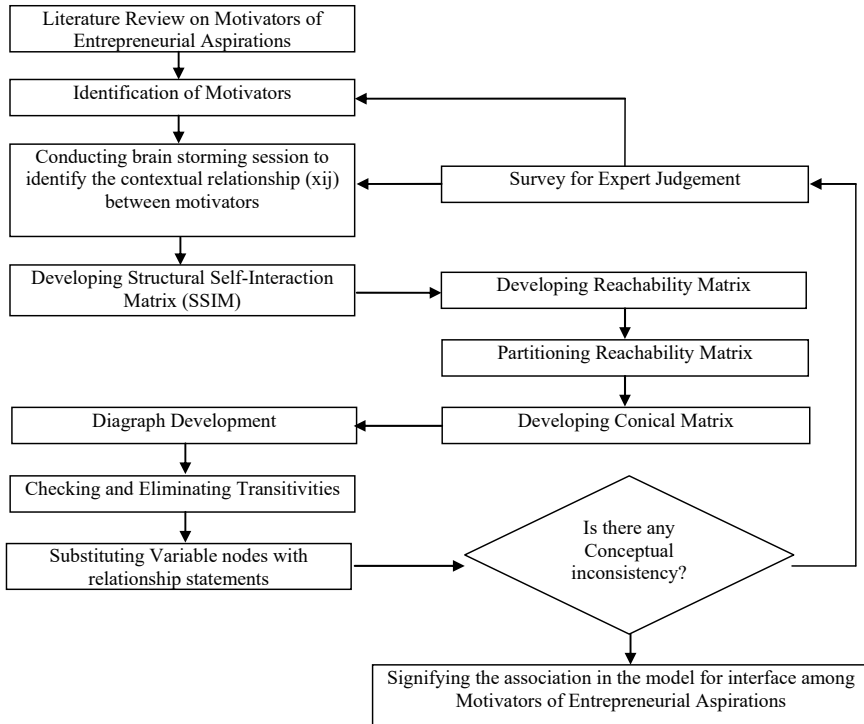
The entrepreneurial aspiration of students depends upon the number of variables and their interrelationship, which would help identify critical factors essential for inducing entrepreneurship spirit. Individuals use ISM in complex situations where they have to use their knowledge and understanding to derive subjective evaluation about the presence or absence of a relationship amongst each pair of variables (Ravi et al., 2005). This methodology helps decide the order and direction among variables in a complex system (Sage and Smith, 1977). ISM is a group cognition process where a set of various variables forms a model. For our present case, numerous variables affect entrepreneurial aspirations; however, the interrelationship amongst the variables, whether direct or indirect, defines the model instead of individual factors taken into consideration. Thus, ISM presents the collective wisdom of the group on these interrelationships.

Judgement of the group on the relationship amongst variables defines the interpretative aspect of ISM, whereas extraction of structure based on relationship demonstrates the structural element of ISM. A diagraph model of the ISM (Figure 1) presents the relationship of the variables and the associated arrangement of the system. The process of ISM methodology involves the following steps:

- Step 1 All the variables which can affect the system are considered.
- Step 2 A contextual relationship is developed among identified factors with one pair at a time.
- Step 3 Developing a structural self-interaction matrix (SSIM) for factors representing the pairwise relationship.
- Step 4 Develop a reachability matrix from the SSIM and conduct a transitivity assessment (The basic assumption behind the transitivity check is that if variable A has a relationship with B and B has a relationship with C. It means that A is also related to C).
- Step 5 Partitioning the reachability matrix into various levels.

- Step 6 Elimination of transitivity links in reachability matrixes lead to the development of diagraph.
- Step 7 Digraph is further transformed into an ISM model.
- Step 8 The ISM model created is examined for any theoretical discrepancies present to make changes accordingly.

**Figure 1** ISM methodology flow chart



### 3.2.1 Variables affecting entrepreneurial aspirations

The authors approached a group of young entrepreneurs, professors, and management professionals from a private university in India (Table 2) to carry out an idea generation exercise. Five young entrepreneurs, three aspiring student entrepreneurs, and two professors participated in the process. The participants comprised seasoned entrepreneurship professors and young entrepreneurs with over seven years of experience and students with more than one year of experience actively involved in various entrepreneurial activities at a particular university. Participants donated sufficient time to reach t consensus on contextual relationships and scores. The exercise led to the generation of the following parameters: family background, high motivation, propensity to create new business, strong self-efficacy, individual cultural context, self-employment, access to resources, need for achievement, entrepreneurship education, entrepreneurship funding, entrepreneurship environment, and identity creation.



3.2.3 Reachability matrix

A binary matrix named the initial reachability matrix is created from SSIM (Table 4). Notations V, A, X, O are replaced with binary numbers 0 and 1 using the following rules:

- if the (i, j) entry in the SSIM is V, then the (i, j) entry in the reachability matrix becomes 1, and the (j, i) entry becomes 0
- if the (i, j) entry in the SSIM is A, then the (i, j) entry in the reachability matrix becomes 0, and the (j, i) entry becomes 1
- if the (i, j) entry in the SSIM is X, then the (i, j) entry in the reachability matrix becomes 1, and the (j, i) entry also becomes 1
- if the (i, j) entry in the SSIM is O, then the (i, j) entry in the reachability matrix becomes 0, and the (j, i) entry also becomes 0.

**Table 4** Preliminary reachability matrix

<i>Drivers of entrepreneurial aspiration</i>		1	2	3	4	5	6	7	8	9	10	11	12
D1	Strong self-efficacy	1	1	1	0	1	1	0	1	0	0	1	0
D2	High motivation	0	1	1	1	0	0	0	1	0	0	0	1
D3	Propensity to create new business	0	0	1	0	0	0	0	0	0	1	1	1
D4	Family background	0	1	0	1	0	1	0	1	0	0	0	1
D5	Individual cultural context	1	0	1	0	1	0	0	0	0	0	1	0
D6	Self-employment	0	0	1	0	0	1	1	0	0	0	0	0
D7	Access to resources	1	1	1	0	0	0	1	0	0	1	0	1
D8	Need for achievement	0	0	1	0	0	1	0	1	0	0	0	1
D9	Entrepreneurship education	0	1	1	0	0	1	0	0	1	1	1	1
D10	Entrepreneurship funding	0	1	1	0	0	1	1	0	0	1	1	0
D11	Entrepreneurship environment	1	1	1	0	0	1	0	0	1	1	1	1
D12	Entrepreneur identity creation	0	1	1	1	0	1	0	1	0	0	0	1

**Table 5** Concluding reachability matrix

<i>Drivers of entrepreneurial aspiration</i>		1	2	3	4	5	6	7	8	9	10	11	12	<i>Driving power</i>
D1	Strong self-efficacy	1	1	1	0	1	1	1*	1	1*	1*	1	1*	11
D2	High motivation	1*	1	1	1	0	1*	0	1	1*	1*	1*	1	10
D3	Propensity to create new business	1*	1*	1	0	0	1*	1*	1*	1*	1	1	1	10
D4	Family background	0	1	1*	1	0	1	1*	1	0	0	0	1	7
D5	Individual cultural context	1	0	1	0	1	0	0	0	0	0	1	1*	5
D6	Self-employment	0	1*	1	1*	0	1	1	0	0	1*	1*	1*	8
D7	Access to resources	1	1	1	0	0	0	1	0	0	1	1*	1	7
D8	Need for achievement	0	1*	1	1*	0	1	1*	1	0	0	0	1	7
D9	Entrepreneurship education	0	1	1	0	0	1	1*	0	1	1	1	1	8
D10	Entrepreneurship funding	0	1	1	0	0	1	1	0	0	1	1	1*	7
D11	Entrepreneurship environment	1	1	1	0	0	1	1*	0	1	1	1	1	9
D12	Entrepreneur identity creation	0	1	1	1	0	1	1*	1	0	1*	0	1	7
Dependence power		6	11	12	5	2	10	10	6	5	9	9	12	

Notes: \*The transitivity assessment is done by evaluating that if i leads to element j and element j leads to element k, then element i should lead to element k.

A concluding reachability matrix (Table 5) is created from the Preliminary reachability matrix (Table 4) by infusing transitivity. Transitivity depicts the association existing among three variables where if variable (i) has a relationship with variable (j), and variable (j) has a relationship with variable (k), then it means that variable (i) is also having a relationship with variable (j). Transitivity is denoted by 1\* in the final reachability matrix (Table 5).

3.2.4 Partition of reachability matrix

Partitioning of the final reachability matrix is performed to determine each variable’s place in the hierarchy. Each variable’s reachability and antecedent sets are obtained from the final reachability matrix (Warfield, 1974). The partition level of the reachability set comprises key factors and various other vital variables to attain partition level. Similarly, the antecedent set contains critical factors and associated factors that help derive the interaction set. Wherever consensus is received on reachability and intersection section, the highest priority is assigned to that variable with the condition that it will not be included in successive iteration. Similar steps are performed till the lowest level is reached, and it becomes a final iteration. For our model, four factors are identified at level I are: high motivation, propensity for creating new business, Entrepreneurship funding, Entrepreneurship Identity creation are found to be the at level I (Table 6). Similarly, iterations are performed till each of the variables are placed at their level. The final results of each variable through iterations are summarised in Table 7.

**Table 6** Motivators iteration I

<i>Driver code</i>	<i>Antecedent set</i>	<i>Reachability set</i>	<i>Intersection set</i>	<i>Level</i>
D1	1, 2, 3, 5, 7, 11	1, 2, 3, 5, 6, 7, 8, 9, 10, 11, 12	1, 2, 3, 5, 7, 11	
D2	1, 2, 3, 4, 6, 7, 8, 9, 10, 11, 12	1, 2, 3, 4, 6, 8, 9, 10, 11, 12	1, 2, 3, 4, 6, 8, 9, 10, 11, 12	I
D3	1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12	1, 2, 3, 6, 7, 8, 9, 10, 11, 12	1, 2, 3, 6, 7, 8, 9, 10, 11, 12	I
D4	2, 4, 6, 8, 12	2, 3, 4, 6, 7, 8, 12	2, 4, 6, 8, 12	
D5	1, 5	1, 3, 5, 11, 12	1, 5	
D6	1, 2, 3, 4, 6, 8, 9, 10, 11, 12	2, 3, 4, 6, 7, 10, 11, 12	2, 3, 4, 6, 10, 11, 12	
D7	1, 3, 4, 6, 7, 8, 9, 10, 11, 12	1, 2, 3, 7, 10, 11, 12	1, 3, 7, 10, 11, 12	
D8	1, 2, 3, 4, 8, 12	2, 3, 4, 6, 7, 8, 12	2, 3, 4, 8, 12	
D9	1, 2, 3, 9, 11	2, 3, 6, 7, 9, 10, 11, 12	2, 3, 9, 11	
D10	1, 2, 3, 6, 7, 9, 10, 11, 12	2, 3, 6, 7, 10, 11, 12	2, 3, 6, 7, 10, 11, 12	I
D11	1, 2, 3, 5, 6, 7, 9, 10, 11	1, 2, 3, 6, 7, 9, 10, 11, 12	1, 2, 3, 6, 7, 9, 10, 11	
D12	1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12	2, 3, 4, 6, 7, 8, 12	2, 3, 4, 6, 7, 8, 12	I

**Table 7** Motivators level iterations II–V

<i>Driver code</i>	<i>Antecedent set</i>	<i>Reachability set</i>	<i>Intersection set</i>	<i>Level</i>
D1	1, 2, 3, 5, 7, 11	1, 2, 3, 5, 6, 7, 8, 9, 10, 11, 12	1, 2, 3, 5, 7, 11	V
D2	1, 2, 3, 4, 6, 7, 8, 9, 10, 11, 12	1, 2, 3, 4, 6, 8, 9, 10, 11, 12	1, 2, 3, 4, 6, 8, 9, 10, 11, 12	I
D3	1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12	1, 2, 3, 6, 7, 8, 9, 10, 11, 12	1, 2, 3, 6, 7, 8, 9, 10, 11, 12	I
D4	2, 4, 6, 8, 12	2, 3, 4, 6, 7, 8, 12	2, 4, 6, 8, 12	III
D5	1, 5	1, 3, 5, 11, 12	1, 5	III
D6	1, 2, 3, 4, 6, 8, 9, 10, 11, 12	2, 3, 4, 6, 7, 10, 11, 12	2, 3, 4, 6, 10, 11, 12	III
D7	1, 3, 4, 6, 7, 8, 9, 10, 11, 12	1, 2, 3, 7, 10, 11, 12	1, 3, 7, 10, 11, 12	II
D8	1, 2, 3, 4, 8, 12	2, 3, 4, 6, 7, 8, 12	2, 3, 4, 8, 12	IV
D9	1, 2, 3, 9, 11	2, 3, 6, 7, 9, 10, 11, 12	2, 3, 9, 11	IV
D10	1, 2, 3, 6, 7, 9, 10, 11, 12	2, 3, 6, 7, 10, 11, 12	2, 3, 6, 7, 10, 11, 12	I
D11	1, 2, 3, 5, 6, 7, 9, 10, 11	1, 2, 3, 6, 7, 9, 10, 11, 12	1, 2, 3, 6, 7, 9, 10, 11	II
D12	1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12	2, 3, 4, 6, 7, 8, 12	2, 3, 4, 6, 7, 8, 12	I

3.2.5 *Developing conical matrix*

The rearrangements of each variable in their respective level are conducted to achieve a conical matrix from the partition reachability matrix. Each variable on a similar level is aggregated to get the final Diagraph (Qureshi et al., 2008). Variables 2, 3, 10, 12 are on a level I. Similarly, variables 7, 11 on level II; variables 1, 5, 6 on level III; variables 8, 9 on level IV, and variable 4 on level V. All variables with their respective partition levels are grouped presented in Table 7. Now, through rearrangement of these elements, the conical matrix is derived and shown in Table 8.

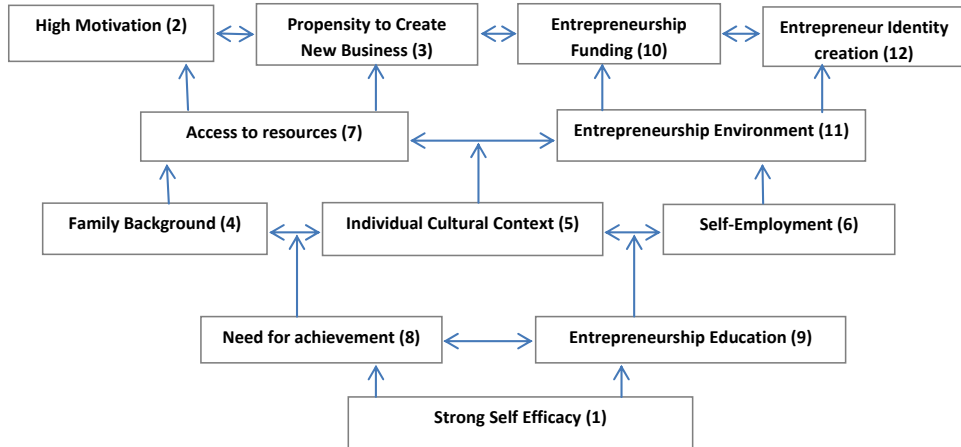
**Table 8** Conical matrix

<i>Drivers of entrepreneurial aspiration</i>	2	3	10	12	7	11	4	5	6	8	9	1	<i>Rank</i>
D2 High motivation	1	1	1	1	0	1*	1	0	1	1	1	1	I
D3 Propensity for creating new business	1	1	1	1	1	1	0	0	1	1	1	1	I
D10 Entrepreneurship funding	1	1	1	1	1	1	0	0	1	0	0	0	I
D12 Entrepreneur identity creation	1	1	1	1	1	0	1	0	1	1	0	0	I
D7 Access to resources	1	1	1	1	1	1	0	0	0	0	0	1	II
D11 Entrepreneurship environment	1	1	1	1	1	1	0	0	1	0	1	1	II
D4 Family background	1	1	0	1	1	0	1	0	1	1	0	0	III
D5 Individual cultural context	0	1	0	1	0	1	0	1	0	0	0	1	III
D6 Self-employment	1	1	1	1	1	1	1	0	1	0	0	0	III
D8 Need for achievement	1	1	0	1	1	0	1	0	1	1	0	0	IV
D9 Entrepreneurship education	1	1	1	1	1	1	0	0	1	0	1	0	IV
D1 Strong self-efficacy	1	1	1	1	1	1	0	1	1	1	1	1	V

### 3.2.6 Development of digraph

An initial digraph with transitivity is obtained from the conical reachability matrix. For the simplicity of the model, we have deleted all the transitivity links. Now variables that are identified at level one are placed on the top of the model. Therefore, variables 2, 3, 10, and 12 are placed on the top and assigned level I (Figure 2).

**Figure 2** ISM of motivators of entrepreneurial aspirations (see online version for colours)



## 4 MICMAC analysis

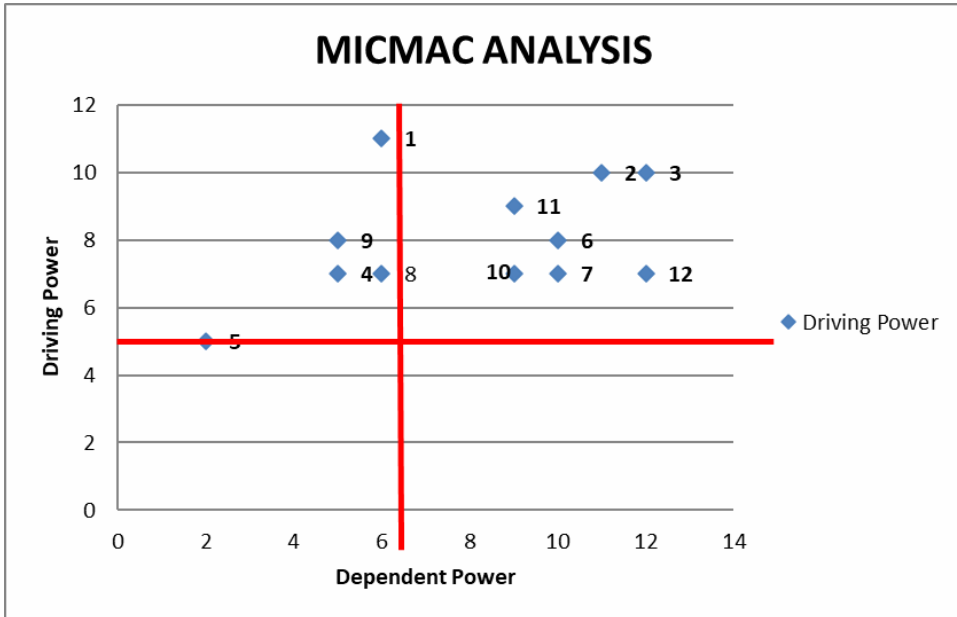
To develop a relevant system, identification and classification of critical elements or variables are necessary steps (Kumar and Rahman, 2013). The author followed similar measures in the present study. Duperrin and Godet (1973) introduced MICMAC analysis, which, according to Watson (1973), lays the importance of critical variables and also demonstrate various other essential variables likely to be affected by critical variables (Qureshi et al., 2008). These affected variables play a crucial role due to their indirect linkage shared with essential variables.

Certain variables strongly influence other variables, suppressing latent variables. According to Saxena and Vrat (1992) and Kumar and Rahman (2013), these latent variables, at times, have a significant effect on the study under consideration. Further, each variable’s driving and dependence power is derived from the reachability matrix (Table 7). Four types of criteria are identified through MICMAC analysis: dependent criterion, independent criterion, autonomous criterion and linkage criterion. Next, all the motivators are classified based on their dependence and driving power (Figure 3).

Figure 3 depicts that individual cultural construct acts as an autonomous criterion, which varies from individual to individual and is isolated from the overall system. Similarly, we found that strong self-efficacy, entrepreneurship education, need for achievement, and the family background represents higher driving power. These are the factors that inspire any individual to take up entrepreneurship initially in his career. These all factors shape individual minds, bodies, and souls to make a career decision in favour of entrepreneurship.



**Figure 3** MICMAC clustering of motivators (see online version for colours)



Rest all the factors are linkage factors having intense driving and dependence power. However, these factors tend to be highly unstable as any change in these variables significantly affects the other variables linked to them. Therefore, variables 2, 3, 11, 6, 7, and 10 were the linkage factors.

### 5 Results, discussion and conclusions

Our study contributes to the present literature by investigating motivators critical for initiating entrepreneurial aspirations amongst university students in India. The present study concludes that the entrepreneurial aspiration of students consists of various factors such as self-efficacy, need for achievement, high motivation, propensity for creating new business and identity creation. These factors suggest that the personal traits of an entrepreneur play an essential role in increasing the probability of university students taking up the entrepreneurial route (Tajeddini and Mueller, 2009; Begley and Boyd, 1987).

Apart from the above factors, entrepreneurship environment, entrepreneurship education, funding, and access to resources are essential for entrepreneurial aspirations. Individual cultural context and family background are vital for fostering entrepreneurial ambitions. The application of ISM techniques has led to building interrelationship amongst different variables and bringing the role of self-efficacy to the centre stage. Self-efficacy has emerged as the driving factor in aspiring entrepreneurial aspirations, which also means that it is essential for any individual who takes a non-conventional path to have a strong belief in oneself. Suppose the student entrepreneur is confident that the decision to opt for independence and decision making is the right path for him. In that case, it indicates the presence of solid self-efficacy an individual possesses. Various

driving forces such as the need for achievement, entrepreneurship education, and family background enhance strong self-efficacy.

Although a vast amount of literature is present on entrepreneurial motivation, most studies have undertaken few factors. Therefore, this study assumes importance because it brings out interrelationships existing amongst various motivators of entrepreneurial aspirations and provides policymakers and university administration with an opportunity to understand how students could take entrepreneurship seriously.

The present study lays increased emphasis on identifying a student's traits, which play an essential role in fanning the entrepreneurial aspiration of students. This trait ranges from self-efficacy to identity creation. These factors emerge as the most significant drivers for student's entrepreneurs and also affect various other motivators. The high driving power variables have a crucial role in bringing strategic orientation and involving dependent variables. Hence critical focus has to be made on identifying students who have the inclination and traits to develop into entrepreneurs.

The current study analyses and presents relationships among various motivators of students' entrepreneurial aspirations through the ISM model in a straightforward manner. Indian students are the reference point for the present model. However, predictors of entrepreneurial aspiration are pretty generic and equally apply in various South Asian and other Asian countries.

Some of the predictors, such as easy availability of funding opportunities and Propensity to create new businesses, are important for entrepreneurs. However, these issues are substantial and secondary. Further, these factors do not deter individuals from undertaking new venture creation. So the two factors which are essential in identifying students who can be potential entrepreneur is personal traits and knowledge of the business environment.

## **6 Limitations and scope for future research**

Like any other study, the present study suffers from various limitations. Since we have used subject experts' inputs for creating our model, it may have the chance of bias in it. Further, the present ISM model must be validated statistically, which means that further study should test the current model using the structural equation modelling (SEM) technique.

An extant literature review helped us identify essential variables for the present study; however, we cannot ignore the possibility of some variables being absent. Some variables considered crucial for future research are risk-taking, tolerance for ambiguity, and locus of control. Risk-taking consists of entrepreneur acceptance of uncertainty concerning financial well-being. At the same time, tolerance of ambiguity means a tendency to view conditions with any clear outcome as attractive. Locus of the control is one's belief regarding how their characteristics affect the results (Shane et al., 2003). With flexibility incorporated in ISM, these variables also give us new opportunities to extend our ISM model in future.

Our model opens up various vistas for future study, considering self-efficacy as the most crucial factor for aspiration amongst students. Hence, to boost the morale and self-beliefs of students, they need to be nurtured from the very beginning. It could positively affect their aspirations for entrepreneurship. Therefore, future researchers can

also study students who wish to undertake entrepreneurship and those not interested and study their self-efficacy and various other factors.

Further, a future study can use case-based methodology on various student entrepreneurs and startups to understand what inspires them to take this unconventional path. The path of entrepreneurship is a path of uncertainty, but it also is the path of opportunity to expand, grow and play an essential role in the economy's growth. If provided with the proper education, skills, and funding opportunities, student entrepreneurial aspirations could lead to a voracious change in the newer generations in the form of role models.

## References

- Afutu-Kotey, R.L., Gough, K.V. and Owusu, G. (2017) 'Young entrepreneurs in the mobile telephony sector in Ghana: from necessities to aspirations', *Journal of African Business*, Vol. 18, No. 4, pp.476–491
- Ajzen, I. (2002) 'Perceived behavioural control, self-efficacy, locus of control and the theory of planned behaviour', *Journal of Applied Social Psychology*, Vol. 32, No. 4, pp.665–683.
- Akerlof, G.A. and Kranton, R.E. (2000) 'Economics and identity', *Quarterly Journal of Economics*, Vol. 115, No. 3, pp.715–753.
- Aldrich, H. (2000) *Organizations Evolving*, Sage, Beverly Hills.
- Aldrich, H. and Zimmer, C. (1986) 'Entrepreneurship through social networks', in Sexton, D. and Smilor, R. (Eds.): *The Art and Science of Entrepreneurship*, pp.3–23, Ballinger, Cambridge, MA.
- Bandura, A. (1997) *Self-efficacy: The Exercise of Control*, Freeman, New York.
- Begley, T.M. and Boyd, D.P. (1987) 'Psychological characteristics of associated with performance in entrepreneurial firms and small businesses', *Journal of Business Venturing*, Vol. 2, No. 1, pp.79–83.
- Bhagwat, R., Carbonara, N. and Sharma, M.K. (2008) 'Opportunities and the spread of information and communication technologies: evidence from the Indian clusters of small-and medium-sized enterprises', *International Journal of Enterprise Network Management*, Vol. 2, No. 3, pp.280–300.
- Bielli, M. and Bielli, A. (2008) 'Innovation paths management in collaborative enterprise clusters', *International Journal of Enterprise Network Management*, Vol. 2, No. 4, pp.366–376.
- Bolaños, R., Fontela, E., Nenclares, A. and Pastor, P. (2005) 'Using interpretive structural modelling in strategic decision-making groups', *Management Decision*, Vol. 43, No. 6, pp.877–895
- Bosma, N. and Harding, R. (2006) *Global Entrepreneurship Monitor (GEM)* [online] <https://www.babson.edu/Academics/centers/blank-center/global-research/gem/Documents/gem-2006-global-report.pdf> (accessed 12 October 2021).
- Brush, C.G. (2008) 'Pioneering strategies for entrepreneurial success', *Business Horizons*, Vol. 51, No. 1, pp.21–27.
- Cardon, M.S., Wincent, J., Singh, J. and Drnovsek, M. (2009) 'The nature and experience of entrepreneurial passion', *Academy of management Review*, Vol. 34, No. 3, pp.511–532.
- Carroll, G.R. and Mosakowski, E. (1987) 'The career dynamics of self-employment', *Administrative Science Quarterly*, Vol. 32, No. 4, pp.570–589.
- Chander, M., Jain, S.K. and Shankar, R. (2013) 'Modeling of information security management parameters in Indian organizations using ISM and MICMAC approach', *Journal of Modelling in Management*, Vol. 8, No. 2, pp.171–189.

- Che Embi, N.A., Jaiyeoba, H.B. and Yussof, S.A. (2019) 'The effects of students' entrepreneurial characteristics on their propensity to become entrepreneurs in Malaysia', *Education + Training*, Vol. 61, Nos. 7/8, pp.1020–1037.
- Corbett, A.C. (2002) 'Recognizing high-tech opportunities: a learning and cognitive approach', *Frontiers of Entrepreneurship Research* [online] [http://www.babson.edu/entrepreneur/Babson2002/II/II\\_P2/II\\_P2.htm](http://www.babson.edu/entrepreneur/Babson2002/II/II_P2/II_P2.htm) (accessed 20 October 2016).
- Daniel, L.J. (2006) 'Integrating innovation: frameworks for entrepreneurial leverage', *International Journal of Enterprise Network Management*, Vol. 1, No. 2, pp.127–146.
- Davidsson, P. (2006) 'Nascent entrepreneurship: empirical studies and developments', *Foundations and Trends® in Entrepreneurship*, Vol. 2, No. 1, pp.1–76.
- Daya, R. (2001) 'Changing the face of multicultural counselling with principles of change', *Canadian Journal of Counselling*, Vol. 35, No. 1, pp.49–62.
- Deakins, D. and Freel, M.S. (2009) *Entrepreneurship and Small Firms*, 5th ed., McGraw-Hill, New York.
- Delmar, F., and Shane, S. (2004) 'Legitimizing first: organizing activities and the survival of new ventures', *Journal of Business Venturing*, Vol. 19, No. 3, pp.385–410.
- Duperrin, J.C. and Godet, M. (1973) 'Methode de hierarchisation des elements d'un systeme', *Rapport economique du CEA*, Vol. 1, No. 2, pp.49–51.
- Estay, C., Durrieu, F. and Akhter, M. (2013) 'Entrepreneurship: From motivation to startup', *Journal of International Entrepreneurship*, Vol. 11, No. 3, pp.243–267.
- Falck, O., Heblich, S. and Luedemann, E. (2012) 'Identity and entrepreneurship: do school peers shape entrepreneurial intentions?', *Small Business Economics*, Vol. 39, No. 1, pp.39–59.
- Farmer, S.M., Yao, X. and Kung-Mcintyre, K. (2011) 'The behavioral impact of entrepreneur identity aspiration and prior entrepreneurial experience', *Entrepreneurship Theory and Practice*, Vol. 35, No. 2, pp.245–273.
- Garg, R., Rahman, Z. Kumar, I. and Qureshi, M.N. (2011) 'Identifying and modelling the factors of customer experience towards customers' satisfaction', *International Journal of Modelling in Operations Management*, Vol. 1, No. 4, pp.359–381.
- Gartner, W.B. (1985) 'A conceptual framework for describing the phenomenon of new venture creation', *Academy of management review*, Vol. 10, No. 4, pp.696–706.
- Gartner, W.B. (1989). Some suggestions for research on entrepreneurial traits and characteristics', *Entrepreneurship Theory and Practice*, Vol. 14, No. 1, pp.27–38.
- Gibb, A.A. (1996) 'Entrepreneurship and small business management: can we afford to neglect them in the twenty-first century business school?', *British Journal of Management*, Vol. 7, No. 4, pp.309–321.
- Gordon, C. (1996) *The Business Culture in France*, Butterworth-Heinemann, Oxford.
- Goyal, P. and Kumar, D. (2017) 'Modeling the CSR barriers in manufacturing industries', *Benchmarking: An International Journal*, Vol. 24, No. 7, pp.1871–1890.
- Hannan, M.T. and Freeman, J. (1984) 'Structural inertia and organizational change', *American Sociological Review*, Vol. 49, No. 2, pp.149–164.
- Heinonen, J. (2007) 'An entrepreneurial-directed approach to teaching corporate entrepreneurship at university level', *Education + Training*, Vol. 49, No. 4, pp.310–324.
- Henley, A. (2007) 'Entrepreneurial aspiration and transition into self-employment: evidence from British longitudinal data', *Entrepreneurship & Regional Development*, Vol. 19, No. 3, pp.253–280.
- Hessels, J., Van Gelderen, M. and Thurik, R. (2008) 'Entrepreneurial aspirations, motivations, and their drivers', *Small Business Economics*, Vol. 31, No. 3, pp.323–339.
- Hollenbeck, G.P. and Hall, D.T. (2004) 'Self-confidence and leader performance', *Organizational Dynamics*, Vol. 33, No. 3, pp.254–269.
- Hurst, E. and Lusardi, A. (2004) 'Liquidity constraints, household wealth, and entrepreneurship', *Journal of Political Economy*, Vol. 112, No. 2, pp.319–347.

- Ireland, R.D. and Webb, J. W. (2007) 'Strategic entrepreneurship: creating competitive advantage through streams of innovation', *Business Horizons*, Vol. 50, No. 1, pp.49–59.
- Kanungo, S. (2005) 'Using process theory to analyze direct and indirect value-drivers of information systems', *Proceedings of the 38th Hawaii International Conference on System Sciences* [online] <https://www.computer.org/csdl/proceedings/hicss/2005/2268/08/22680231c.pdf> (accessed 12 October 2021).
- Katiyar, R., Barua, M.K. and Meena, P.L. (2015) 'Modelling the measures of supply chain performance in the Indian automotive industry', *Benchmarking: An International Journal*, Vol. 22, No. 4, pp.665–696.
- Kirzner, I.M. (1995) *Creatividad, capitalismo y justicia distributiva*, Union Editorial S.A., Madrid.
- Kolvereid, L. and Isaksen, E. (2006) 'New business startup and subsequent entry into self-employment', *Journal of Business Venturing*, Vol. 21, No. 6, pp.866–885.
- Kourilsky, M.L. and Walstad, W.B. (1998) 'Entrepreneurship and female youth: knowledge, attitudes, gender differences, and educational practices', *Journal of Business Venturing*, Vol. 13, No. 1, pp.77–88.
- Kumar, D. and Rahman, Z. (2013) 'Modelling relationship marketing strategies for sustainability adoption', *International Journal of Intercultural Information Management*, Vol. 3, No. 4, pp.277–291.
- Kuratko, D.F. (2005) 'The emergence of entrepreneurship education: development, trends, and challenges', *Entrepreneurship theory and practice*, Vol. 29, No. 5, pp.577–598.
- Kwong, C. and Thompson, P. (2016) 'The when and why: student entrepreneurial aspirations', *Journal of Small Business Management*, Vol. 54, No. 1, pp.299–318.
- Levesque, M., Shepherd, D.A. and Douglas, E.J. (2002) 'Employment or self-employment: a dynamic utility-maximizing model', *Journal of Business Venturing*, Vol. 17, No. 3, pp.189–210.
- Linan, F. and Fernandez-Serrano, J. (2014) 'National culture, entrepreneurship and economic development: different patterns across the European Union', *Small Business Economics*, Vol. 42, No. 4, pp.685–701.
- Mahajan, R., Agrawal, R., Sharma, V. and Nangia, (2014) 'Factors affecting quality of management education in India: An interpretive structural modelling approach', *International Journal of Educational Management*, Vol. 28, No. 4, pp.379–399.
- Marchesnay, M. (1998) *The State of the Art in Small Business and Entrepreneurship*, Ashgate, Aldershot.
- Markham, G., Balkin, D. and Baron, R. (2002) 'Inventors and new venture formation: the effects of general self-efficacy and regretful thinking', *Entrepreneurship Theory and Practice*, Vol. 27, No. 2, pp.149–165.
- Matlay, H. (2006) 'Researching entrepreneurship and education: part 2: what is entrepreneurship education and does it matter?', *Education+ Training*, Vol. 48, Nos. 8/9, pp.704–718.
- McClelland, D.C. (1965) 'N achievement and entrepreneurship: a longitudinal study', *Journal of personality and Social Psychology*, Vol. 1, No. 4, pp.389–392.
- Moore, C.M. (1987) *Group Techniques for Idea Building*, Sage Publications, London.
- Morrison, A. (2000) 'Entrepreneurship: what triggers it?', *International Journal of Entrepreneurial Behavior & Research*, Vol. 6, No. 2, pp.59–71.
- Murray, H.A. (1938) *Explorations in Personality*, Oxford Univ. Press, Oxford, England.
- Palich, L.E. and Bagby, D.R. (1995) 'Using cognitive theory to explain entrepreneurial risk-taking: challenging conventional wisdom', *Journal of Business Venturing*, Vol. 10, No. 6, pp.425–438.
- Peterman, N.E. and Kennedy, J. (2003) 'Enterprise education: influencing students' perceptions of entrepreneurship', *Entrepreneurship theory and practice*, Vol. 28, No. 2, pp.129–144.

- Pfeifer, S., Salija, N. and Susac, M.Z. (2016) 'Shaping the entrepreneurial mindset: entrepreneurial intentions of business students in Croatia', *Journal of Small Business Management*, Vol. 54, No. 1, pp.102–117.
- Pfohl, H., Gallus, P. and Thomas, D., (2011) 'Interpretive structural modeling of supply chain risks', *International Journal of Physical Distribution & Logistics Management*, Vol. 41, No. 9, pp.839–859.
- Qunlian, H. (2011) 'The major difficulties and countermeasures of current university graduates' entrepreneurship in China', *Journal of Chinese Entrepreneurship*, Vol. 3, No. 3, pp.228–239.
- Qureshi, M.N., Kumar, D. and Kumar, P. (2008) 'An integrated model to identify and classify the key criteria and their role in the assessment of 3PL services providers', *Asia Pacific Journal of Marketing and Logistics*, Vol. 20, No. 2, pp.227–249.
- Rahmati, Z. (2014) 'The study of academic burnout in students with high and low level of self-efficacy', *Procedia Social and Behavioral Sciences*, Vol. 171, No. 1, pp.49–55.
- Ramayah, T. and Harun, Z. (2005) 'Entrepreneurial intention among the student of Universiti Sains Malaysia (USM)', *International Journal of Management and Entrepreneurship*, Vol. 1, No. 1, pp.8–20.
- Rasmussen, E. and Borch, O.J. (2010) 'University capabilities in facilitating entrepreneurship: a longitudinal study of spin-off ventures at mid-range universities', *Research Policy*, Vol. 39, No. 5, pp.602–612.
- Ravi, V., Shankar, R. and Tiwari, M.K. (2005) 'Productivity improvement of a computer hardware supply chain', *International Journal of Productivity and Performance Management*, Vol. 54, No. 4, pp.239–255.
- Ravichandran, K., Venkatesh, K., Saravanan, K., Muruganandham, R. and Muralidharan, S. (2016) 'Applying fuzzy logic decision-making approach to analyse the students' self-management perspective in professional education', *International Journal of Enterprise Network Management*, Vol. 7, No. 4, pp.285–297.
- Resmi, A.T., Gemini, V.J., Silvian, P. and Kannan, K. (2014) 'Leadership, commitment, culture and employee turnover – a deeper examination', *International Journal of Enterprise Network Management*, Vol. 6, No. 1, pp.1–13.
- Reynolds, P.D. (1993) 'The role of entrepreneurship in economic systems: developed market and post-socialist economies', Paper presented at the *2nd Freiberg Symposium on Economics*, Freiberg, Germany, 9–11 September.
- Reynolds, P.D., Hay, M. and Camp, S.M. (1999) *Global Entrepreneurship Monitor*, p.3, Kauffman Center for Entrepreneurial Leadership, Kansas City, Mo.
- Sage, A.P. and Smith, T.J. (1977) 'On group assessment of utility and worth attributes using interpretive structural modeling', *Computers & Electrical Engineering*, Vol. 4, No. 3, pp.185–198.
- Sandhu, M.S., Sidique, S.F. and Riaz, S. (2011) 'Entrepreneurship barriers and entrepreneurial inclination among Malaysian postgraduate students', *International Journal of Entrepreneurial Behavior & Research*, Vol. 17, No. 4, pp.428–449.
- Sanyal, S. and Hisam, M.W. (2015) 'Factors affecting entrepreneurial aspirations among Omani youth: an empirical study', *International Journal of Business and Administration Research Review*, Vol. 2, No. 9, pp.1–14.
- Sarasvathy, S.D. (2001) 'Causation and effectuation: toward a theoretical shift from economic inevitability to entrepreneurial contingency', *Academy of management Review*, Vol. 26, No. 2, pp.243–263.
- Saxena, J.P., and Vrat, P. (1992) 'Hierarchy and classification of program plan elements using interpretive structural modeling: a case study of energy conservation in the Indian cement industry', *Systems Practice*, Vol. 5, No. 6, pp.651–670.
- Saxena, J.P., Sushil and Vrat, P. (2006) *Policy and Strategy Formulation: An Application of Flexible Systems Methodology*, GIFT Publishing, Delhi.

- Schumpeter, J.A. (1934) *The Theory of Economic Development: An Inquiry Into Profits, Capital, Credit, Interest, and the Business Cycle*, Vol. 55, Transaction Publishers, Piscataway, USA.
- Segal, G., Borgia, D. and Schoenfeld, J. (2005) 'The motivation to become an entrepreneur', *International Journal of Entrepreneurial Behavior & Research*, Vol. 11, No. 1, pp.42–57.
- Shane, S. (2000) 'Prior knowledge and the discovery of entrepreneurial opportunities', *Organization Science*, Vol. 11, No. 4, pp.448–469.
- Shane, S. and Venkataraman, S. (2000) 'The promise of entrepreneurship as a field of research', *Academy of Management Review*, Vol. 25, No. 1, pp.217–226.
- Shane, S., Locke, E. and Collins, C. (2003) 'Entrepreneurial motivation', *Human Resource Management Review*, Vol. 13, No. 2, pp.257–279.
- Shapiro, A. (1975) 'The displaced, uncomfortable entrepreneur', *Psychology Today*, Vol. 9, No. 6, pp.83–88.
- Shapiro, A. and Sokol, L. (1982) 'The social dimensions of entrepreneurship', in Kent, C., Sexton, D. and Vesper, K. (Eds.): *The Encyclopedia of Entrepreneurship*, pp.72–90, Prentice-Hall, Englewood Cliffs, NJ.
- Sharma, M.K. (2007) 'Information system architecture: a framework for Indian small and medium enterprises', *International Journal of Enterprise Network Management*, Vol. 1, No. 4, pp.406–424.
- Singh, R.K., Garg, S.K. and Deshmukh, S.G. (2007) 'Interpretive structural modelling of factors for improving competitiveness of SMEs', *International Journal of Productivity and Quality Management*, Vol. 2, No. 4, pp.423–440.
- Sinha, T.N. (1996) 'Human factors in entrepreneurship effectiveness', *Journal of Entrepreneurship*, Vol. 5, No. 1, pp.23–39.
- Soto-Acosta, P. (2008) 'The e-business performance measurement in SMEs', *International Journal of Enterprise Network Management*, Vol. 2, No. 3, pp.268–279.
- Souitaris, V., Zerbinati, S. and Al-Laham, A. (2007) 'Do entrepreneurship programmes raise entrepreneurial intention of science and engineering students? The effect of learning, inspiration and resources', *Journal of Business Venturing*, Vol. 22, No. 4, pp.566–591.
- Sprinthall, A.S., Sprinthall, R.C. and Oja, S.O. (1994) *Educational Psychology. A Developmental Approach*, 6th ed., McGraw-Hill, New York.
- Starbuck, W.H. (1983) 'Organizations as action generators', *American Sociological Review*, Vol. 48, No. 1, pp.91–102.
- Stevenson, H.H. and Jarillo, J.C. (2007) 'A paradigm of entrepreneurship: entrepreneurial management', in *Entrepreneurship*, pp.155–170, Springer Berlin, Heidelberg.
- Tajeddini, K. and Mueller, S.L. (2009) 'Entrepreneurial characteristics in Switzerland and the UK: a comparative study of techno-entrepreneurs', *Journal of International Entrepreneurship*, Vol. 7, No. 1, pp.1–25.
- Van Der Merwe, R., Pitt, L., Barnes, B.R., Berthon, P.R. and Salehi-Sangari, E. (2008) 'Finding the hidden value in SME networks', *International Journal of Enterprise Network Management*, Vol. 2, No. 2, pp.145–166.
- Van Praag, C.M. and Cramer, J.S. (2001) 'The roots of entrepreneurship and labour demand: individual ability and low risk aversion', *Economica*, Vol. 68, No. 269, pp.45–62.
- Venkataraman, S. (1997) 'The distinctive domain of entrepreneurship research: an editor's perspective', in Katz, J. and Brockhaus, R. (Eds.): *Advances in Entrepreneurship, Firm Emergence, and Growth*, JAI, Press, Greenwich, CT.
- Vernon-Wortzel, H. and Wortzel, L.H. (Eds.) (1997) *Strategic Management in a Global Economy*, John Wiley and Sons, New York.
- Walter, S.G., Parboteeah, K.P. and Walter, A. (2017) 'University departments and self-employment intentions of business students: a cross-level analysis', *Entrepreneurship Theory and Practice*, Vol. 37, No. 2, pp.175–200.

- Warfield, J.N. (1973) 'Binary matrices in system modeling', *IEEE Transactions on Systems, Man, and Cybernetics*, Vol. 3, No. 5, pp.441–449.
- Warfield, J.W. (1974) 'Developing interconnected matrices in structural modeling', *IEEE Transcript on Systems Men and Cybernetics*, Vol. 4, No. 1, pp.51–81.
- Weick, K.E. (1979) *Social Psychology of Organizing*, Addison-Wesley, Reading, MA.
- Wilson, F., Kickul, J. and Marlino, D. (2007) 'Gender, entrepreneurial self-efficacy, and entrepreneurial career intentions: implications for entrepreneurship education', *Entrepreneurship Theory and Practice*, Vol. 31, No. 3, pp.387–406.
- Young, R.A., Marshall, S.K. and Valach, L. (2007) 'Making career theories more culturally sensitive: implications for counselling', *The Career Development Quarterly*, Vol. 56, No. 1, pp.4–18.
- Yu, X., Wang, P., Zhai, X., Dai, H. and Yang, Q. (2015) 'The effect of work stress on job burnout among teachers: the mediating role of self-efficacy', *Social Indicators Research*, Vol. 122, No. 3, pp.701–708.