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Role of intellectual capital in augmenting the start-up intentions of Indians—an analysis using GEM data

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Abstract

Purpose: Although the intellectual capital (IC) has already received much attention from the researchers in the field of innovation performance, there is still a paucity in the measuring of the role of IC in venture creation. The present study is an attempt to examine the influence of IC on start-ups.

Methodology: In this study, a large data set of 3360 respondents from India provided by the largest entrepreneurship research project GEM has been used. A logistic regression technique has been applied to measure the influence of IC on the entrepreneurial intentions.

Findings: It has been found that the components of intellectual capital, i.e., knowledge and skills, entrepreneurial opportunities, and the network, has a positive and significant impact on the entrepreneurial intentions.

Contribution: To the best of our knowledge, it is among the initial studies, which have examined the relationship between intellectual capital and entrepreneurial intentions. Only a few studies have already been done in developing countries like India by using a large data set.

Introduction

Intellectual capital (IC), defined as the set of intangible assets from which ventures can derive their competitive advantage, enhance profit and create value, continues to attract widespread attention (Bontis 1996; Bontis 1998; Bontis 2001; Sveiby 1997; Petty and Guthrie 2000; Hormiga et al. 2011). Many scholars have already shed light on the different dimensions of intellectual capital (Andrikopoulos 2010). One of the most widely accepted definition by Edvinsson and Sullivan 1996 considered IC as the knowledge that can be converted into value. It is an excellent source for generating wealth and has garnered much attention in the present scenario (Seng et al. 2018). The intellectual is something which cannot be measured independently, and it always depends on some other factors for its measurement. The selection of these variables is still an intriguing question, and many authors have proposed various compositions of different variables.

It is an established fact that the venture creation is one of the most significant component for the growth of a nation (Arenius & Minniti 2005). There are numerous factors which

either enhances the venture creation or diminishes it. It is necessary to understand and nurture those factors, which will take the venture creation capacity to the next level. The primary objective of this study is to measure the potential of intellectual capital in promoting the venture creation specifically in India which is yet to be explored (Kamath 2017).

Until now most of the studies which have been conducted on intellectual capital were related with different aspects like measuring its impact on economic performance (Ya-Hui 2013) or with innovation performance (Agostini et al. 2017; Yitmen 2011).

Nowadays the policy makers are very much interested in exploring new areas related to start-ups. The importance of start-ups has motivated some researchers to examine the role of IC in the success of start-ups (Hayton 2005; Hormiga et al. 2011; Link and Ruhm 2009; Martina and Ahsan 2013; Peña 2002). Some researchers have also analyzed the relationship between intellectual capital and venture creation (Arafat and Saleem 2017; Matricano 2016; Ramos-Rodríguez et al. 2010; Ramos-rodríguez et al. 2012) but the results of these studies cannot be generalized in a developing country like India. In this study, the authors have tried to analyze the relationship of intellectual capital with the entrepreneurial intentions, as the intention is the best predictor of entrepreneurial activity (Krueger et al. 2000).

It is quite understood that the relationship between intellectual capital and venture creation has not been clearly defined so far. The contributions of this manuscript are multi-fold. Firstly, the research sheds light on the significance of intellectual capital in promoting the avenues for venture creation. Secondly, a large data set of 3360 respondents from India has been used. The largest entrepreneurship research project, Global Entrepreneurship Monitor, has provided the data. To the best of our knowledge, it is among the initial studies, which have examined the relationship between intellectual capital and entrepreneurial intentions. This seeks to overcome from the limitations of previous studies which are confined up to analyzing the impact of intellectual capital from managerial perspective only. The findings of the study also seek to suggest a different composition of the components of intellectual capital in relation to entrepreneurship.

To measure the effect of IC on the venture creation, this paper is structured in the following manner. In “Literature review” section, the relevant literature has been reviewed for understanding the concept of IC. After mentioning the detailed description of the dependent variable (entrepreneurial intention), the IC has also explained instead of the entrepreneurial studies. In “Hypotheses of the study” section, the hypotheses of the study have been discussed. In “Research methodology” section, the research methodology (binary logistic regression model) and the research design are elaborated. The empirical part has been done with the help of secondary data provided, by the Global Entrepreneurship Monitor (GEM) website for 2014 in India. In “Results and discussion” section, the findings of the analysis have been discussed. In “Implications of the study” section, the managerial implications related to the study have been given. In “Limitations” section, the limitations of the study have been highlighted. At last, in “Conclusion” section, the overall conclusion of the research has been discussed.

Literature review

The intellectual capital theorists believe that knowledge improves an individual's cognitive skills thus allowing them to work more productively and efficiently. Entrepreneurs

discover opportunities easily because their experience and education help them understand the value of new information easily as compared to others (Roberts 1991; Shane 2000). The knowledge base which constitutes the intellectual capital and determines the individual's capacity in recognizing business opportunities consists of their educational qualification, their knowledge and soft skill competency, their relationships with existing entrepreneur, and their previous experience as an entrepreneur. Intellectual capital has been classified into different components by different authors. It is also tough to decide which classification is incorrect. The present study considers knowledge & skills, entrepreneurial opportunities, networking and owning and managing as proxy measures for calculating the intellectual capital of Indians.

Entrepreneurial intention

The main point of investigation over here is the extent to which intellectual capital is relevant to aspiring entrepreneurs. The proxy measure for entrepreneurial intention (latent variable) is the expectation to start-up, i.e., the inclination of intentional entrepreneurs toward initiating new ventures.

The entrepreneurial intention is the set of reasons that determines individuals to engage in a particular behaviour or for venture creation (Shane et al. 2003). The intention to start a new venture generally depends on three perceptions; individual perception, the perception of economic opportunities and socio-cultural perceptions (Liñán et al. 2011).

Nowadays the researchers are keenly interested in forming the promotional policies for entrepreneurship, and they need to know the propensity towards entrepreneurship (Ajzen 1991; Baron 2004; Bird 1988; Krueger et al. 2000; Lee and Wong 2004; Maticano 2016; Shaver and Scott 1991). In the light of existing literature, it can be said that the entrepreneurs have a stronger entrepreneurial intention or inclination towards venture creation while the non-entrepreneurs have a weaker inclination or even have no affinity.

Knowledge and skills

The entrepreneurial skills and knowledge are not necessarily linked to the educational level. Some authors claim that it is not always necessary to have a specific education for possessing entrepreneurial abilities (Leazar 2005; Murphy et al. 1991). These skills and knowledge can be acquired through the past experiences and those people who have them are more likely to become entrepreneurs (Ucbasaran et al. 2003; Szivas 2001). Individuals who possess necessary skills and knowledge would be more likely to engage in activities relating to entrepreneurship (such as opportunity recognition). The above discussion has hypothesized the effect of knowledge and skills on the start-up intentions of Indians.

Ability to recognize opportunities

Opportunity recognition plays a pivotal role in encouraging the individuals to start their businesses (Shane et al. 2003; McMullen and Shepherd 2006). The theory of planned behaviour states that the actions of individuals have been influenced by their attitude (Ajzen 1991). It also defined attitude as "the degree to which a person has a favourable or unfavourable evaluation or appraisal of the behaviour in question."

Whenever individuals perceive that a lot of business opportunities are there, they immediately start evaluating their abilities to get some of them. If their evaluations are positive a favorable attitude towards the behaviour will be formulated (Ajzen 1991). This attitude will lead to the formation of intention and behaviour as well.

The start-ups can use the acts of recognition, discovery or knowledge creation (Alvarez and Barney 2008; Matricano 2016; Sarasvathy et al. 2005). The aspiring entrepreneurs can use the existing entrepreneurial opportunities like technological or social. In other words, the entrepreneurs are supposed to have possessed some specific capabilities for identifying new entrepreneurial opportunities which already exist in the economic context, e.g., short gaps occurring in the market (Kirzner 1973). By above discussion, it can be asserted that the recognition of opportunities enhances the entrepreneurial intentions.

Networking

According to the perspective of the theory of planned behaviour (Ajzen 1991), knowing existing entrepreneurs personally, always help in generating positive attitudes towards the entrepreneurs.

According to the role theory, those individuals who have a strong networking with existing entrepreneurs are more likely to come across the information and facts which would make them more competent in venture creation.

Finally, the network theory states that networking plays a significant role in suggesting a business plan, providing preliminary information and resources for start-ups (Larson and Starr 1993). Contacts with entrepreneurs will also provide access to other entrepreneurs of interest to the new firm (Ramos-rodríguez et al. 2012).

Owning and managing a firm

It is related with those individuals who possess prior experience in owning and managing a firm. Generally, individuals pay more attention to that information which are related to their existing pool of knowledge (Shane 2000). It is a common presumption that experienced entrepreneurs are mostly good at recognizing and developing opportunities (McGrath and Macmillan 2000; Westhead et al. 2005). There is also a difference of opinion among the authors regarding the same; some authors argue that those people who possess experience in owning and managing any business would be better in recognizing opportunities McGrath (1996) and Ronstadt (1988). While other authors believe that entrepreneurial expertise would be helpful in generating opportunities (Ucbasaran et al. 2006; Shane et al. 2003).

In the light of various previous literature, it can be said that entrepreneurial experience in a specific sector helps entrepreneurs recognize business opportunities (Markahm and Baron 2003; Cooper and Park 2008).

For example, someone who already worked in the FMCG industry would be able to identify the strengths, weaknesses, opportunities & threats of that particular industry very quickly as compared to others. An existing business can be a source of new ideas both in itself and for the entrepreneur through previous experiences in the search for opportunities (Alsos and Kaikkonen 2004). Individual's prior knowledge consists of three factors which are essential for opportunity discovery – prior knowledge of markets, previous experience of ways to serve those markets, and prior knowledge of customer problems.

Hypotheses of the study

The primary objective of this study is to gauge the impact of intellectual capital on the inclination toward venture creation/entrepreneurial intention. The intellectual capital has been measured by the amount of knowledge and skills, the ability to recognize opportunities, networking, and owning and managing a firm. The expectation to start a new business after some time has been taken as the proxy measure for entrepreneurial intention. Some demographic factors have also been considered as control variables.

Figure 1 shows the hypothesized relationship between the components of intellectual capital and the entrepreneurial intention. It shows a clear relationship between the measures of intellectual capital, knowledge and skills, entrepreneurial opportunities, networking, and owning and managing a firm with entrepreneurial intentions. It also shows the relationship of demographic variables; age, gender, and education with entrepreneurial intentions.

H1: More knowledge and skills lead to the higher entrepreneurial intentions.

H2: More entrepreneurial opportunities lead to the higher entrepreneurial intentions.

H3: Networking has a positive influence on an entrepreneurial intention of Indians, or it increases the probability of being entrepreneurs in India.

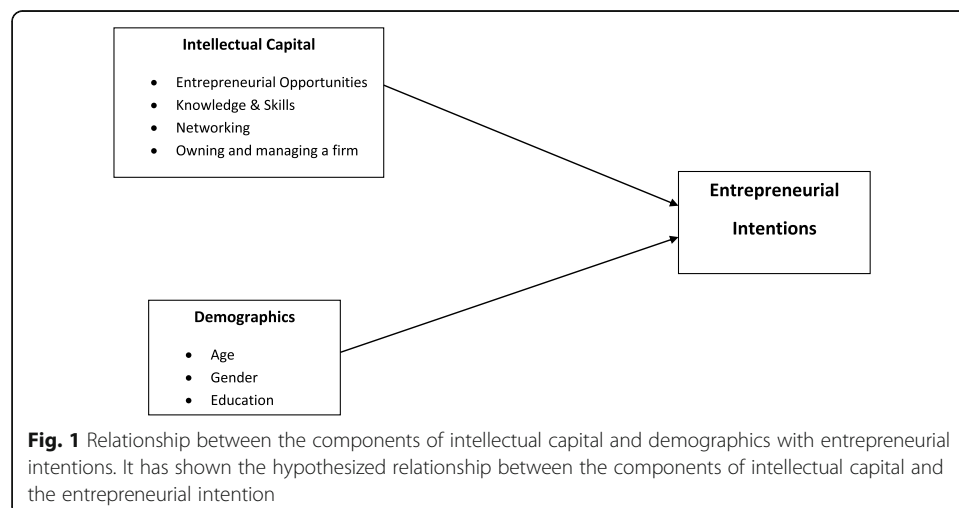
H4: Individuals who own and manage a firm are more likely to become entrepreneurs.

Research methodology

Data

It has been stated earlier that the present study is based on a cross-sectional survey and the data for empirical analysis has been extracted from the Global Entrepreneurship Monitor (GEM) database. The primary aim of this study is to measure the effect of intellectual capital on the start-up intentions in India for 2014.

The questionnaires of GEM also contain items related to intellectual capital and entrepreneurial intentions which help examine the entrepreneurial activity up to a decent level (Reynolds et al. 2005). The GEM database is not meant to provide all the



information about the entrepreneurial intentions. Moreover, the survey provides data on many variables; we selected those variables which are coherent to the objectives of this study (Arafat and Saleem 2017). It has overcome some previous limitations as the data is generated through an extensive international survey of general Adult Population Survey (APS). This dataset relies on the interviews of 3360 respondents from India. The data has been gathered accordingly to the collection procedure of GEM which had been discussed by (Reynolds et al. 2005).

Measures

Table 1 provides the detailed description of the dependent and independent variables.

Logistic regression

The logistic regression model has been used because the dependent variables as well as the independent variables both are dichotomous or categorical. It helps in estimating that a respondent belongs to a particular group (dependent = 1) or not (independent = 0).

Results and discussion

Analysis of this research has been divided into three parts; descriptive statistics, correlation, and regression analysis.

Descriptive statistics

The descriptive statistics (Table 2) shows that only 10% of individuals are expected to start their own business in the next three years, 38% see excellent opportunities in starting their own business, 38% of individuals are confident in their skills and knowledge to start a new business, 24% of the respondents have a relationship with existing

Table 1 Description of variables

Dependent variables	Description	
Entrepreneurial intention	Do you expect to start a new business in the next three years?	If, Yes = 1 No = 0
Independent variables		
Intellectual capital	Perceives to have the required knowledge and skills to start a business	If, Yes = 1 No = 0
	Perceives good opportunities to start a business in the area where you live	If, Yes = 1 No = 0
	Personally knows someone who started a firm in the past two years	If, Yes = 1 No = 0
	Have some prior experience in owning and managing a firm	If, Yes = 1 No = 0
Control variables		
Age	Age of the respondents	Year of Birth
Gender	Gender	If, Females = 2 Males = 1
Education	There are 5 categories for education 0 = None, 1 = Some secondary education, 2 = Secondary degree, 3 = Post-secondary education, and 4 = University Bachelor's degree or higher	The reference category for logistic regression will be "none"

entrepreneur, and only 9% of individuals have prior experience in owning and managing a firm. The average age of the respondents is 36 years.

Correlation

Correlation matrix (see Table 3) provides preliminary support for the hypotheses. Table 3 depicts that all the variables except education are correlated with the entrepreneurial intention in the expected direction. However, age and gender are negatively associated with entrepreneurial intention.

Logistic regression

In the omnibus test (Table 4), if all the values are lesser than 0.05, it shows that the goodness of fit of the model is acceptable.

To measure the goodness of fit, the Hosmer and Lemeshow's (Table 5) test has been used. If the p value is more than .05, it is considered significant, and the hypothesis of an adequate model fit is acceptable. In this way, Table 5 shows the model is the proper fit.

Table 6 presents the binomial logistic regression results with the all intellectual capital factors and demographic factors showing an impact on entrepreneurial intention. All the intellectual capital factors have been found significant in influencing entrepreneurial intention.

In the first hypothesis, it had been proposed that the knowledge & skills of an individual influencing the entrepreneurial intentions in a positive way. The marginal effect for this variable is positive and significant ($p < .01$) so the hypothesis has been confirmed. The odds ratio for this variable is 2.059 which means those individuals who possess the skill, knowledge, and expertise are almost two times more likely to start their own business. This finding is also in congruence with previous research examining the influence of knowledge, skill, and expertise on entrepreneurial propensity (Ahmad et al. 2014; Fernández et al. 2009; Guzmán-Alfonso and Guzmán-Cuevas 2012;

Table 2 Descriptive statistics

	<i>N</i>	Minimum	Maximum	Mean	Std. Deviation
Are you alone or with others, expecting to start a new business, including any type of self-employment, within the next three years?	3294	0	1	.10	.302
In the next 6 months, will there be good opportunities for starting a business in the area where you live?	3122	0	1	.38	.484
Do you have the knowledge, skill, and experience required to start a new business?	3275	0	1	.38	.485
Do you know someone personally who started a business in the past 2 years?	3308	0	1	.24	.428
Are you alone or with others, currently the owner of a business you help manage, self-employed, or selling any goods or services to others?	3340	0	1	.09	.291
Age	3360	18	64	35.68	12.543
Gender	3360	1	2	1.53	.499
Education level	3357	0	1720	825.44	574.306
Valid <i>N</i> (list wise)	2985				

Table 3 Correlations

	Entrepreneurial intention	Entrepreneurial opportunities	Knowledge and skills	Networking	Owning and managing	Age	Gender	Education level
Entrepreneurial intention	1							
Entrepreneurial opportunities	.195**	1						
Knowledge and skills	.175**	.291**	1					
Networking	.101**	.206**	.262**	1				
Owning and managing	.136**	.126**	.184**	.148**	1			
Age	-.066**	-.0018	0.024	.046**	.038*	1		
Gender	-.045**	-.074**	-.122**	-.113**	-.135**	.072**	1	
Education level	0.02	-.0026	.042*	.094**	-.036*	-.237**	-.189**	1

**Correlation is significant at the 0.01 level

*Correlation is significant at the 0.05 level

Table 4 Omnibus tests of model coefficients

		Chi-square	df	Sig.
Step 1	Step	200.212	10	.000
	Block	200.212	10	.000
	Model	200.212	10	.000
Model summary				
Step		-2 Log likelihood	Cox and Snell R Square	Nagelkerke R Square
1		1791.801	.065	.133

Estimation terminated at iteration number 6 because parameter estimates changed by less than .001

Honjo 2015; Liñán et al. 2011; Matricano 2016; Nishimura and Tristan 2011; Noguera et al. 2013; Pathak and Laplume 2015; Puriwat and Tripopsakul 2015; Tsai et al. 2016; Vidal-suñé and López-Panisello 2013; Wennberg et al. 2013).

In the second hypothesis, it had been proposed that the ability to recognize opportunities increases the probability of becoming an entrepreneur. The marginal effect for this variable is positive and significant ($p < .01$) in about the regression supporting this hypothesis. This variable has the most substantial impact on the entrepreneurial intentions, since its odds ratio is 2.649. It indicates that opportunity identification increases the likelihood of new start-up by more than 2.5 times than the rest of the individuals. This result also coincides with the results of other studies examining the same relationship (Ahmad et al. 2014; Fernández et al. 2009; Honjo 2015; Issue et al. 2016; Liñán et al. 2011; Matricano 2016; Nishimura and Tristan 2011; Pathak and Laplume 2015; Puriwat and Tripopsakul 2015; Ramos-rodríguez et al. 2012; Tsai et al. 2016; Vidal-suñé and López-Panisello 2013).

It had been proposed in the third hypothesis that knowing existing entrepreneurs increases the entrepreneurial propensity. The marginal effect for this variable is also positive and significant ($p < .01$) which supports the hypothesis. The odds ratio for networking is 1.431 which indicates that the relations with the existing entrepreneur increases the likelihood of becoming an entrepreneur by 1.5 times. This result also coincides with the previous findings in the entrepreneurship and intellectual capital literature (Arafat et al. 2018; Ahmad et al. 2014; Fernández et al. 2009; Honjo 2015; Issue et al. 2016; Liñán et al. 2011; Mancilla and Amoros 2015; Matricano 2016; Pathak and Laplume 2015; Puriwat and Tripopsakul 2015; Ramos-rodríguez et al. 2012).

In the fourth and last hypothesis, it had been proposed that prior experience in owning or managing a firm enhances the probability of becoming an entrepreneur or entrepreneurial intentions. The marginal effect for this variable is positive and significant ($p < .01$) in about the regression supporting this hypothesis. The odds ratio for this variable is 2.011 which shows that those individuals who have already owned & managed a firm ever in their lifetime, have a probability to start their own business, almost two times higher than the others. This finding is also similar to some previous researches (Ramos-rodríguez et al. 2012, Mickiewicz, Stephen 2016).

Table 5 Hosmer and Lemeshow test

Step	Chi-square	Df	Sig.
1	10.192	8	.252

Table 6 Logistic regression (dependent variable: entrepreneurial intention)

	B	S.E.	Wald	df	Sig.	Exp(B)
Intellectual capital						
Knowledge and Skills	.722	.136	28.372	1	.000	2.059
Opportunities recognition	.974	.135	52.447	1	.000	2.649
Networking	.358	.137	6.826	1	.009	1.431
Owning and managing	.698	.171	16.721	1	.000	2.011
Demographic variables						
Age	-.023	.006	15.725	1	.000	.978
Gender	-.041	.129	.103	1	.748	.959
Education level			9.170	4	.057	
Some secondary	-2.104	.739	8.108	1	.004	.122
Secondary	-2.131	.726	8.602	1	.003	.119
Post-secondary	-2.181	.721	9.146	1	.002	.113
Graduate	-2.134	.723	8.714	1	.003	.118
Constant	-.227	.765	.088	1	.767	.797

Results related to demographic variables indicate that age and education level are significantly affecting the entrepreneurial intention. The influence of age is opposite, as expected since every additional year of age of respondents is associated with decreasing probability to show entrepreneurial intention. This result is robust as it confirms the past research (Fernández et al. 2009).

Similarly, education is also negatively related to entrepreneurial intention, even, all the categories of education level are negatively correlated with the start-up intention. The finding explains that higher the education level lower the entrepreneurial start-up. Analogous to age and education, gender is also negatively related to the intention to start the new business, but this association is not significant (Noguera et al. 2013).

Implications of the study

The positive and significant impact of knowledge and skills on the entrepreneurial intentions show that those who possess the required knowledge and skills are more likely to become entrepreneurs. That is why the government is being supposed to reform its existing policies in such a way that it should be focused, especially for the development of skills and knowledge.

The theoretical knowledge can be provided very easily and quickly but when it comes to the practical exposure, only a few institutes are providing expertise and training for entrepreneurship altogether. Like National Institute for Entrepreneurship and Small Business Development, Indian Institute of Entrepreneurship, Entrepreneurship Development Institute of India. The government needs to expand and establish new institutes for entrepreneurial training.

The policymakers are also supposed to be more focused on developing the opportunity recognition abilities because it has been established by the findings that whosoever can recognize an opportunity in starting the business is more likely to become an entrepreneur than the rest of the masses. The government needs to make people aware

about the avenues where they can find an opportunity for themselves like special economic zones, a concept of Make in India and other sectors in which the government is providing some subsidies, etc.

The networking is also influencing the entrepreneurial intentions in a positive manner which indicates that those people who are in contact with the existing entrepreneurs are more likely to start their own ventures. The policymakers are required to facilitate the interactions and discussions between the current entrepreneurs and intentional entrepreneurs. The problems of the upcoming entrepreneurs will get resolved by the experience of existing entrepreneurs and they will get other resources as well.

The entrepreneurial experience also has a significant impact on the entrepreneurial intentions which means those people who have entrepreneurial or job experience are more likely to become entrepreneurs. Therefore, the government should start focusing on existing entrepreneurs and those who are working; it will help out in enhancing the entrepreneurial activities. Moreover, other explanation of this finding is that if the policy makers focus on nurturing the experienced and existing entrepreneur, this practice will increase the chances of developing the serial and portfolio entrepreneurs.

Limitations

Like other studies, it also has some research constraints. First one is related to the data provided by the GEM consortium; the items related to intellectual capital are few. The second obstacle is associated with the nature of data, as the data was collected on single item measures. It prevents more accurate statistical techniques such as structural equation modeling that may show mutual interaction among the variables. The third aspect is that the model is based on Western countries and the Indians may not entirely share the same frame of reference as their western counterparts. The last constraint is that the respondents that formed entrepreneurial intention would remain stable over time.

Conclusion

Though intellectual capital research is in its infancy (Andrikopoulos 2010) yet a promising field for researchers (Forte et al. 2017). This is particularly true in developing countries like India only a few studies have been conducted so far to understand the effects of intellectual capital on the venture creation phenomenon.

The present study has gauged the impact of knowledge and skills, ability to recognize opportunities, networking, and owning and managing a firm, along with some demographic variables on the entrepreneurial intentions. The data had been extracted from the Global Entrepreneurship Monitor and the data set relies upon the interviews of 3360 respondents from India. The analysis has been done with the help of logistic regression. The results of the study suggest that all the components of intellectual capital are positively significant with the entrepreneurial intentions. Those people who possess these traits are more likely to become an entrepreneur while old age and educated people are less likely to become entrepreneurs. The unexpected relationship between demographic variables with entrepreneurial intention raises another debate.

Abbreviations

AME: Association of Muslim Entrepreneurs; APS: Adult population survey; CWEL: Consortium of Women Entrepreneurs of India; EDII: Entrepreneurship Development Institute of India; EI: Entrepreneurial intentions; GEM: Global entrepreneurship monitor; IC: Intellectual capital; IIE: Indian Institute of Entrepreneurship; NIESBUD: National Institute for Entrepreneurship and Small Business Development

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Availability of data and materials

The data had been extracted from the GEM, which is generated through a large international survey of general Adult Population Survey (APS). This data set relies upon the interviews of 3360 respondents from India. The data had been gathered accordingly to the collection procedure of GEM which had been discussed by (Reynolds et al. 2005).

Authors' contributions

All the authors have read and approved the final manuscript. Both first and second authors have contributed the major part while the third, fourth, fifth, sixth, and seventh have contributed comparatively lesser.

Competing interests

The authors declare that they have no competing interests.

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