

Role of Entrepreneurial Motivation towards the Entrepreneurial Intentions among Engineering Students: A Mediated Moderated Research Framework

Kittisak Jernsittiparsert^{1,2}, Jutamat Sutduean³, Chutipan Sutduean⁴

²Department for Management of Science and Technology Development, Ton Duc Thang University, Ho Chi Minh City, Vietnam

³ Faculty of Social Sciences and Humanities, Ton Duc Thang University, Ho Chi Minh City, Vietnam

E-mail: kittisak.jernsittiparsert@tdtu.edu.vn

³ College of Innovative Business and Accountancy, Dhurakij Pundit University, Bangkok, Thailand

E-mail: 607191030012@dpu.ac.th

⁴ Graduate School, Suan Sunandha Rajabhat University, Bangkok, Thailand

E-mail: chutipan_law@outlook.com

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Abstract:

With the increasing unemployment around the globe, entrepreneurship has gained intense attention from the professional of different domains. In this regard academia has paid extensive attention to this. Having considered the importance of such issue the present study attempted to examine the impact of entrepreneurial motivation on the entrepreneurial intentions of the engineering students. In this regard data were collected from the engineering discipline students by using simple random sampling. Measurement model and structural equation modeling techniques have been used in data analysis. The findings of the study revealed that entrepreneurial motivations (need for success, independence, and economic motivations) significantly influence the entrepreneurial intentions of the engineering students. In addition to this study also reported that attitude, subjective norms and perceived behavioral control found to be significant mediator between relationships of entrepreneurial motivations (attitude and perceived behavioral control) and entrepreneurial intentions. Whereas subjective norms were not found to be significant mediator between relationships of entrepreneurial motivations and entrepreneurial intentions.

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I. INTRODUCTION

Entrepreneurship has emerged to be feasible solution for individual career adoption. It has become a more prevalent choice for the individuals to go for (Sriyakul & Jernsittiparsert, 2019). Besides this, it is also serving as a key driver for the economic development around the globe, making a viable contribution towards the jobs and social wealth as well (O'Connor, 2013; Rabbi, Bature, Omari, & Jernsittiparsert, 2019). Interestingly it has emerged to be an

important subject at undergraduate level. Now the entrepreneurship education is more widely demanded by students as well. In this regard it is important to consider the few facts as well which are as follows: 41% of "college freshman" regard the entrepreneurial education either "essential" or "very important" (Petrakis, Kostis, & Kafka, 2016). Besides the entrepreneurial education there are other factors as well which do contribute towards the entrepreneurial intentions. Such as the need to become independent and ear one's own livelihood is the leading

factors which do motivate an individual towards the entrepreneurship. Whereas some of the individuals are motivated because of their wish to gain the economic independence. Or some may go for it because of their social needs as they have to live in a society and they are very much conscious regarding their social status.

With the increasing unemployment and shrinking job markets it has become necessary for the engineering students also to go for the entrepreneurship. There is obvious difference between the perceptions towards the entrepreneurship of both the engineering and non-engineering students. They are being educated regarding the entrepreneurship which tends to shape their behaviors and intentions (Law & Breznik, 2017). However the question regarding what are the other factors which can influence their intentions towards the entrepreneurship is still unanswered. In this regard the present study has opted the entrepreneurial motivation of the engineering students regarding the entrepreneurial intentions. Nowadays universities are also paying greater attention and are striving hard to accomplish their ultimate mission of encouragement of the social and economic development of their surroundings by new business ventures, developing the entrepreneurial abilities among graduates and by employing the new ways to boost up the engineering students to get engaged with the entrepreneurship (Barba-Sánchez & Atienza-Sahuquillo, 2018).

Furthermore, Barba-Sánchez and Atienza-Sahuquillo (2018), supported that above mentioned arguments by contending that the present crisis and higher unemployment rates has intensified the labor markets and thus there is more need of skilled engineers besides their engineering education only. They go on further and argued that education related to engineering is confronted with new challenges and one of them is the equipped engineers have greater entrepreneurial viability. They also made an argument that entrepreneurial education has been incorporated into new engineering degrees but still it poses a question that is it sufficient to scale entrepreneurship among engineers? Following such an interesting and promising question raised, the present study is aimed to explore the factors that lead towards the entrepreneurship. The study also seeks for the role of entrepreneurial motivation in influencing the attitude, subjective norms and perceived behavioral control of the engineering students. This seeks to answer that how the individual motivation can influence the entrepreneurial intentions.

So the study will address the following research questions:

1. Do the need for success influence the entrepreneurial intentions?
2. Do the need for independence influence the entrepreneurial intentions?

3. Do the economic motivations influence the entrepreneurial intentions?
4. Do entrepreneurial motivations influence the attitude, subjective norms and perceived behavioral control of the engineering students?
5. Do the behavioral aspects mediate between the relationship of entrepreneurial motivations and entrepreneurial intentions?

Now the teaching and learning dynamics are changing around the globe rapidly which has altogether changed the college and university environment. Theory and practice is being merged globally regardless of the discipline of study. Thus it has gained much attention from the academicians. When it comes to the engineering discipline the work integrated learning has emerged as a significant concept and teaching methodology which is extensively used by the academicians. It helps the universities to produce engineering students which do have the value added skills such as experience. It ensures the better learning skills and better economic outcome as well (Agwa-Ejon & Pradhan, 2017). So the present study has considered the engineering work integrated learning as a potential moderator between the relationships of behavioral aspects and entrepreneurial intentions. Therefore the study will address the following research questions:

1. Do engineering work integrated learning will moderate between relationship of attitude and entrepreneurial intentions?
2. Do engineering work integrated learning will moderate between relationship of subjective norm and entrepreneurial intentions?
3. Do engineering work integrated learning will moderate between relationship of perceived behavioral control and entrepreneurial intentions?

It is obvious that everybody is not entrepreneur by birth. Every student do not pursue the entrepreneurial career. Similar is the case with the engineering graduates as well. It is not compulsory and observed that very student pursue the entrepreneurial career. However efforts can be put to scale their intentions and provide them with value added skills besides providing them with good and extra ordinary coaching. So they can gain knowledge beyond the engineering and go for a new venture (Schnell, gen Westarp, & Sheppard, 2019). So it is argued that when students provide with the practical knowledge regarding their subjects and they learn more from the practice will bring about more positive changes among them and will scale up their entrepreneurial intentions as well. They can be provided with the practical experience by offering them with the opportunity of the internships, integrating their education with industry etc. In this regard it has been argued that intentions regarding the entrepreneurship vary not even from person to person but they do vary from disciplines as well. Previously the major focus of the studies

was on the factors which can engage students in the entrepreneurship. However the present study followed a different perspective and went beyond the engaging factors only.

The careful literature analysis reveals that Theory of planned behavior (TPB) has been used for more than 20 years to study the entrepreneurial education impact on entrepreneurial intentions. Besides the intensive focus on TPB still there are research gaps which needs to be fulfilled (Sun, Lo, Liang & Wong, 2016). In this regard the current study has considered the entrepreneurial motivations as a potential antecedent for the entrepreneurial intentions. There are great number of studies which have focused on the entrepreneurship but only few of them have considered the role of the work integrated learning as a potential factor that can boost the relationship between behavioral aspects and entrepreneurial intentions of engineering students. In addition to previously mentioned research questions the present study will address the following question as well:

1. Do the engineering work integrated learning moderate the relationship between behavioral aspects and entrepreneurial intentions?

The study has extensively focused on the engineering education and students because it is part of routine life. Samadi (2013), stated that engineering students demand is increasing rapidly. Besides this they are also supposed to possess some extra skills other than their academia only. Need for technology is increasing thus it also put a pressure on the individuals which belong to the engineering discipline, the individuals who are self-motivated to go for business ventures and are not in need of the long period of mentorship. While on the other hand the work being done in the engineering domain is also increasing ever and it has left the business graduates with no more time for mentorship. Thus created a demand for the self-initiative among the graduates. Consequently, universities, industry and firms etc. are keenly searching for the individuals who do possess the knowledge, better communication skills and are ready to take on the industry. Furthermore, the entrepreneurship of engineering students has gained much more attention because the cost to get educated is increasing over the years and universities are also being pressurized to put forward the graduates which are employable and can get success in their career either by pursuing a job or going for a new business venture.

The focus of the study is the engineering education. The study is bases in Indonesia which is the fourth most populous country of the world. Among the top five academic discipline choices engineering ranked as the second largest academic choice of the Indonesian students. The following chart is showing that over the period of five years the trend to go for engineering among the Indonesian students remained persistent.

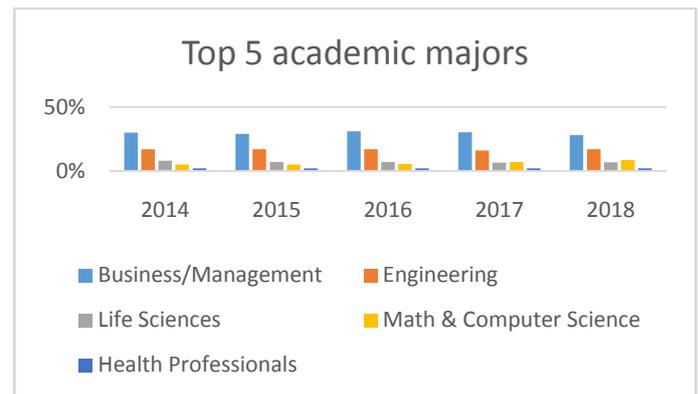


Figure 1

Source: *Export.gov* (2019)

The present research study contributes to the knowledge by providing evidence about how to motivate and enable the engineer entrepreneurs. The study provides the evidence regarding the motivational factors for the entrepreneurial intentions of the engineering graduates which can be used to develop more positive and entrepreneurship oriented strategy to deal with the industry demands and meet the giant challenge of the unemployment at all levels. The study provides evidence regarding the needs of students/graduates which do motivate them to be entrepreneur. The next sections of the study will elaborate the detailed literature review regarding the underlying constructs, methods adopted, discussion and future directions as well.

II. LITERATURE REVIEW

Entrepreneurial Intentions

Jwara and Hoque (2018), made a comment on the rapidly changing world and argued that nowadays the growth rate of unemployed graduates is increasing with the time. Such an increase is adding to the value of the entrepreneurship due to which it has become a factor which can assist to effectively and efficiently increase the employment levels. Especially it can proved to be a significant factor to scale up employment and economic growth simultaneously.

Entrepreneurs are being encouraged in current era as it helps to drive the economic and social prosperity. It further also reduces the burden of the job creation from the government as well. In this regard it has been stated that entrepreneurship is key driver of job creation and making heavy contributions towards the economic growth and overall prosperity of the nation(OEDC, 2012). Entrepreneurship has also become a major concern and gaining importance in the Europe as well. Entrepreneurial intentions generally speaking refers to the individuals intentions to be an entrepreneur, to go for a business venture or to do something revolutionary for the existing business (Siriattakul & Jermstittiparsert, 2019). Thompson (2009) has defined the entrepreneurial intentions as

“self-acknowledged conviction by a person that they intend to set up a new business venture and consciously plan to do so at some point in the future”. Choo and Wong (2006), has defined the entrepreneurial intentions as “the exploration and assessment of information which is beneficial to achieve the objective of business creation”. In addition to this they argued that entrepreneurship is mainly focused to have intentions related to it before going for any actual new venture as it is the key determinant to start a business or doing something new in existing business.

These intentions denotes to the decision of a person to get employed from the unemployed state or be a salaried person based on self-employment (Krueger Jr, Reilly, & Carsrud, 2000). Basically it is the personal stimulus to become an employed individual where such decision is voluntary. From another perspective the entrepreneurial intentions denotes to the sensible know-how and personal belief regarding the intention to go for a new business and an aim to do such thing in future (Liñán, Nabi, & Krueger, 2013). Whereas it is also said that it do describe the intent to be self-employed or to start a new venture (Nabi, Liñán, Iakovleva, Kolvereid, & Stephan, 2011). Individual's commitment also plays a key role determining the entrepreneurial intentions. Fridoline (2009), stated that entrepreneurial intentions importance lies in self-employment intentions. So it can be argued that these intentions enable an individual to go for the new business ventures. These intentions stimulate the thrust to search for new things to do (Wmpgc & Gunatissa, 2014). A study was conducted which pointed out the factors that do account for the entrepreneurial intentions among individuals. The study findings revealed that the Indonesians have the higher entrepreneurial intentions which were due to the economic challenges being faced by the public (Kristiansen & Indarti, 2004).

Entrepreneurial Motivation

Entrepreneurship has become an optima and challenging career choice for individuals. The individual's tendency towards the entrepreneurship can be motivated by range of factors. One of the major factor for individual motivation is the education. When the individual are provided with the education and certain skills it boosts their confidence and they tend to go for new ventures (Jwara & Hoque, 2018). By definition entrepreneurship is move to accomplish certain goals. So besides education certainly there are other factors exist too. Current study has considered the factors such as need for success, need for independence and economic motivations as a potential determinant of the entrepreneurial intentions. These are the key motivators for an individual to go for the entrepreneurship. Recently a study has reported that entrepreneurial motivation namely; need for success, independence and economic motivations significantly predict

the entrepreneurial intentions (Barba-Sánchez & Atienza-Sahuquillo, 2018). Motivation can also change the behavioral patterns of an individual. From the previous studies (Alam, Kousar, & Rehman, 2019) it is concluded that when an individual is positively motivated by his or her personal needs he or she will strive hard to obtain the outcomes. Thus the motivation will ultimately influence the attitude positively.

H1: *Need for success is significantly associated with the entrepreneurial intentions*

H2: *Need for independence is significantly associated with the entrepreneurial intentions*

H3: *Economic motivation is significantly associated with the entrepreneurial intentions*

Theory of Planned Behavior

Theory of planned behavior is widely used and accepted theory in the domain of the organizational behaviors. Previously various studies have explained the comprehensiveness of the theory of planned behavior to explain the intentions from both perspectives individual or entrepreneurial. Theory of planned behavior argues that three components lead towards the intentions and then the intentions translates into the behavior. The three components of theory of planned behavior are as follows: attitude towards the behavior, social norms and perceived behavioral control. These mentioned three drivers drive the intentions (Ojiaku, Nkamnebe, & Nwaizugbo, 2018). Attitude denotes to the extent to which a behavior is positively or negatively performed. Social norms denotes to the pressure exerted by society or others such as family, friends, and other personal as well and then they accept or reject someone's behavior (Liñán & Chen, 2006). Finally the perceived behavioral control refers to the relative easiness or trouble to perform a certain behavior. It is somehow similar to the well-known concept self-efficacy. Following section will elaborate the three factors in detail and how do they influence the intentions.

Attitude

Theory of planned behavior has been widely used to determine the intentions; over the years it has been proved to be strong predictor and a good model to determine the intentions (Van Gelderen et al., 2008). Therefore, it is also most appropriate model to be used to determine the entrepreneurial intentions. The first factor in this model is attitudes of an individual which are said to influence and shape the intentions. In this regard Sheeran (2002) commented that intention is the key to behavior. Thus, various behaviors can be predicted by intentions. Entrepreneurial intentions can be predicted by the attitudes, which are linked with the person's perception and they are also learnable ultimately promotes the entrepreneurship. Previously researchers have

argued that when it comes to the attitude it denotes to the extent to which an individual is positively or negatively perceive the development of entrepreneurial career. Such attitude is very much broad and is inclusive of factors related to the affect such as preferences. It is also inclusive of factors related to the evaluations namely; benefits and demerits(Liñán, Rodríguez-Cohard, & Rueda-Cantuche, 2011).Furthermore, literature also highlights that individual attitude directed at the entrepreneurship is one of the major aspects which do shape the willingness to go for the new business venture (Kautonen, van Gelderen, & Fink, 2015; Kautonen, Van Gelderen, & Tornikoski, 2013). Therefore, it is argued that when an individual has the positive attitude towards the entrepreneurship, he or she may go for setting up a new business. In addition theory of planned behavior from the attitude perspective also do points out that personal belief regarding his or her capabilities can potentially impact the attitude towards the entrepreneurship(Rosique-Blasco, Madrid-Guijarro, & García-Pérez-de-Lema, 2018).

Attitude is the first factor in TPB which possess as a key aspect accountable for success when it comes to learning(Uygun & Kasimoglu, 2013). In addition Veludo-de-Oliveira (2009) contended that the attitude can be positive or negative regarding anything that a person is seeing or observing. Attitude has also been defined as aspect which is based on and survives on the trust, emotions and behavioral tendency aimed at the different objects, events or symbols as well(Ogundipe, Kosile, Olaleye, & Ogundipe, 2012). In addition to this attitude can be claimed as an individual's response towards the appraisal as well as the acceptance and rejection of behaviors. Previously studies have reported that attitude predicts the entrepreneurial intentions. Sun, Lo, Liang, and Wong (2017), conducted a study to assess the influence of entrepreneurial education on entrepreneurial intentions. They collected data from 200 students which were studying the engineering subjects from three universities in Hong Kong. They reported that attitude significant predicts the entrepreneurial intentions. Hence, it is argued that when the students have positive attitude towards becoming an entrepreneur they will tend to be more entrepreneurship oriented as compared to students with the negative attitude. Therefore, it is hypothesized that:

H4: *Attitude significantly predicts the entrepreneurial intentions among engineering students.*

Subjective Norms

Subjective norms is the second factor in the theory of planned behavior which denotes to "the people's perceptions about the approval or disapproval, of individuals who are close to them regarding the setting up of a business venture". Previously the subjective norms have been defined as influence on individual which is exerted by the society and environment and it also

serves as a stimulus for the individuals to go for setting up a new business or act in a certain specified way(Ajzen, 1991).How the subjective norms works? In this regard Marire (2015) argued that if a person's family rejects any of his or her behavior or idea to be an entrepreneur; there will be very few chances remain in a sense that such person will opt for the entrepreneurship. Hence, it is stated that individuals are surrounded by certain subjective norms which up to certain degree do influence the individual. Therefore it is hypothesized that:

H5: *Subjective norms significantly predicts the entrepreneurial intentions among engineering students.*

Perceived Behavioral Control

Entrepreneurship is regarded as a multifaceted construct which do have several challenges and complexities as well. It is also associated with various uncertainties and risks. Success is the ultimate goal in any domain of life so it is in the entrepreneurship as well. In this regard it has been argued that when in order to get success in the entrepreneurship it is necessary that the particular person should possess certain skills, abilities, confidence and resources to deal with the various uncertainties and can also control his or her entrepreneurship related actions. The higher control over the actions will tend to result in more positive assessment of the entrepreneurial actions(Rosique-Blasco et al., 2018). Perceived behavioral control is the third construct in theory of planned behavior which do denotes the control of an individual over his or her actions regarding the entrepreneurship or in general as well. Therefore it is hypothesized that:

H6: *Perceived behavioral control significantly predicts the entrepreneurial intentions among engineering students.*

Engineering Work Integrated Learning

Work integrated learning is the new way to advance the teaching at colleges and universities. Especially in the domain of engineering discipline the work integrated learning is regarded as the top notch method which helps to produce students who do possess the practical knowledge beforehand along with their recognition as a graduate. It is also regarded as a method which helps to introduce the lifelong learning which is related to the positive objectives and a beneficial financial consequence. On conclusive remarks it can be argued that work integrated learning is inclusive of incorporation of theory and practice. It further goes to the incorporation of laboratory practices as well which do assist the students to learn better. Finally it offers the students with personal, professional and academic success and betterment(Agwa-Ejon & Pradhan, 2017). Engineering is completely a

vocational education and students also do know that the practice they do will ultimately benefit them and will help them to gain the experience before they go to the next stage of workplace (Blackwell, Bowes, Harvey, Hesketh, & Knight, 2001). In a nutshell the work integrated learning provides the students with the benefits regarding their academic outcomes and general performance related to their domain as well (Samadi, 2013). Looking at the benefits of the work integrated learning there is strong need for the Higher Education Institutions to carry out such programs and meet the needs of the students and their professional development (Froyd, Wankat, & Smith, 2012).

The present study has considered the work integrated learning as a potential moderator which can uplift the relationship between TPB elements and entrepreneurial intentions. Previously there are different findings have been reported regarding this relationship such as few studies have reported the relationship between TPB elements and entrepreneurial intentions (Krueger Jr et al., 2000). Interestingly the findings of the studies previously conducted are not consistent regarding their reported results. Some of the previous studies have reported that subjective norms do not fully explain the entrepreneurial intentions. Previously few studies have reported that subjective norms do significantly explain the variance in entrepreneurial intentions (Kolvereid & Isaksen, 2006). Whereas some other studies are also available in the literature which reported that subjective norms are not significant predictor for the entrepreneurial intentions (Autio, H. Keeley, Klofsten, GC Parker, & Hay, 2001). In addition Ajzen (2005) conducted a study and reported that subjective norms significantly influence the entrepreneurial intentions. Recently Haider, Gill, and Noreen (2017) conducted a review study has argued that perceived organizational support may increase the entrepreneurial intentions of the business graduates. This affirms that when the engineering students are provided with the work integrated learning, they will gain the value added skills and can go for the business venture. As the results about the relationship are not consistent affirms that there is some other factor which is causing such issues. So the present study has considered the work integrated learning as a potential moderator which can boost up the relationship between TPB elements and entrepreneurial intentions. If an individual do have the right attitude, follow the norms and have a good control over the behavior, then if he provided with the right education with practical knowledge will be more oriented towards the entrepreneurship. Therefore, it is hypothesized that:

H7a: *Work integrated learning positively moderate between relationship of attitude and entrepreneurial intentions of engineering students.*

H7b: *Work integrated learning positively moderate between relationship of subjective norms and entrepreneurial intentions of engineering students.*

H7c: *Work integrated learning positively moderate between relationship of perceived behavioral control and entrepreneurial intentions of engineering students.*

Attitude, Subjective Norms and Perceived Behavioral Control as a Mediator

Previously studies have reported that entrepreneurial motivation significantly influence the attitudes and perceived behavioral control (Alam et al., 2019; Barba-Sánchez & Atienza-Sahuquillo, 2018). Moreover studies have also reported a relationship between attitude and entrepreneurial intentions (Kautonen et al., 2015; Kautonen et al., 2013; Sun et al., 2017), subjective norms and entrepreneurial intentions (Marire, 2015) and finally between perceived behavioral control and entrepreneurial intentions (Rosique-Blasco et al., 2018). Therefore it is hypothesized that all the factors of behavior acts as a significant mediator between relationship of entrepreneurial motivation and intentions. So it is hypothesized that:

H8a: *Need for success positively mediates between relationship of attitude and entrepreneurial intentions of engineering students.*

H8b: *Need for success positively mediates between relationship of subjective norms and entrepreneurial intentions of engineering students.*

H8c: *Need for success positively mediates between relationship of perceived behavioral control and entrepreneurial intentions of engineering students.*

H9a: *Need for independence positively mediates between relationship of attitude and entrepreneurial intentions of engineering students.*

H9b: *Need for independence positively mediates between relationship of subjective norms and entrepreneurial intentions of engineering students.*

H9c: *Need for independence positively mediates between relationship of perceived behavioral control and entrepreneurial intentions of engineering students.*

H10a: *Economic motivation positively mediates between relationship of attitude and entrepreneurial intentions of engineering students.*

H10b: *Economic motivation positively mediates between relationship of subjective norms and entrepreneurial intentions of engineering students.*

H10c: *Economic motivation positively mediates between relationship of perceived behavioral control and entrepreneurial intentions of engineering students.*

Following figure 2 is showing the research framework for the present study:

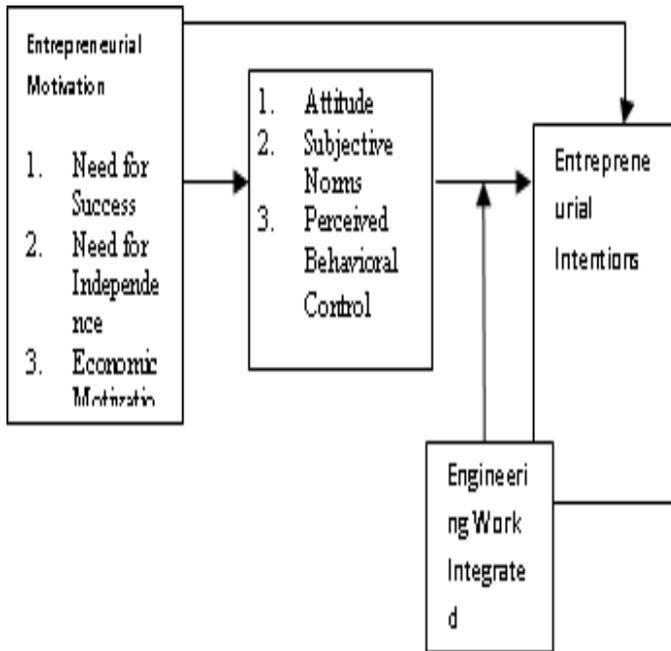


Figure 2. Research Framework

III. METHODOLOGY

Having considered the importance of the engineering education the present study attempted to explore the relationship between that do influence the entrepreneurial intentions among the engineering graduates. In this regard the entrepreneurial motivation which is compose of need for success, independence and economic motivations considered as independent variable, entrepreneurial intentions have been included as dependent variable. Furthermore, TPB elements have been considered as mediator which are composed of attitude, subjective norms and perceived behavioral control. In addition to this the study has also included the engineering work integration as a moderator. The study is quantitative and descriptive in nature.

Population of the current study are the students of engineering schools in Indonesian universities. For a research study it is necessary to collect data from the representative set of population which is called sample. It can be selected by using number of approaches such as Krejcie and Morgan (1970) according to which the maximum sample size is 384 for a given number of population, other one sample size criteria is proposed by Barlett, Kotrlik, and Higgins (2001) according to which the sample size should be at least 20% of the population. However, as the certain number of population was not known so the thumb rule has been used to determine the sample size. According to which the number of questions are to be multiplied with 10 and the outcomes will be the sample size. There were 26 total questions in the questions so as per the rule the sample size for the study is (26*10) 260 respondents. To ensure the minimum sample size 300 questionnaires were distributed out of which 250 responses were used as a valid for data collection.

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Data were collected from the respondents by using the questionnaire which collected their personal information and their responses to the questions regarding the variables under study. 5 point Likert scale has been used for all the measures in the study. Entrepreneurial motivation has been measured by adapting 10 items out of which three items were related to need for success and independence respectively and remaining four items related to the economic motivations (Amabile, Hill, Hennessey, & Tighe, 1994). Three items each were used to measure attitude and subjective norms, whereas four items were used for the perceived behavioral control (Rosique-Blasco et al., 2018). Five items were adapted for the work integrated learning and finally entrepreneurial intentions were also measured by using five items (Autio et al., 2001). For data analysis Smart-PLS has been used. The PLS-SEM has been applied in this study as it is suitable in case if the purpose of the study is to test a theory or to make some prediction. The next section of the present study will elaborate the findings in detail.

IV. FINDINGS

Table 1
Confirmatory Factor Analysis

Constructs	Items	Loadings	Alpha	CR	AVE
Attitude	Att.1	0.891	0.848	0.908	0.767
	Att.2	0.832			
	Att.3	0.904			
Entrepreneurial Intentions	EI1	0.78	0.776	0.851	0.554
	EI2	0.823			
	EI3	0.842			
	EI4	0.831			
	EI5	0.291			
Economic Motivations	EM1	0.831	0.827	0.886	0.662
	EM2	0.837			
	EM3	0.706			
	EM4	0.869			
Engineering Work Integrated Learning	EWI1		0.845	0.883	0.525
	L1	0.788			
	EWI2				
	L2	0.797			
	EWI3				
	L3	0.721			
Engineering Work Integrated Learning	EWI4		0.845	0.883	0.525
	L4	0.483			
	EWI5				
Engineering Work Integrated Learning	L5	0.747	0.845	0.883	0.525
	EWI6				
Engineering Work Integrated Learning	L6	0.772			

		EWI			
		L7	0.712		
Need for Success		NFS	0.61	0.7	0.5
	1	0.854	7	78	43
		NFS			
		2	0.596		
		NFS			
		3	0.738		
Need for Independence			0.69	0.8	0.6
	NI1	0.815	8	31	22
		NI2	0.834		
		NI3	0.711		
Perceived Behavioral Control	PBC		0.91	0.9	0.8
	1	0.921	3	45	52
		PBC			
		2	0.933		
		PBC			
		3	0.915		
Subjective Norms			0.79	0.8	0.7
	SN1	0.885	5	78	06
		SN2	0.833		
		SN3	0.801		

Table 2
Fornell-Larcker Criterion

	Att.	EI	EM	EWIL	NFS	NI	PBC	SN
Att.	0.876							
EI	0.710	0.744						
EM	0.524	0.556	0.813					
EWIL	0.579	0.589	0.466	0.724				
NFS	0.400	0.410	0.510	0.263	0.737			
NI	0.236	0.267	0.303	0.229	0.622	0.789		
PBC	0.468	0.520	0.467	0.423	0.205	0.171	0.923	
SN	0.560	0.588	0.538	0.594	0.329	0.284	0.554	0.840

Table 2 is showing the values for the Fornell-Larcker Criterion which determines the discriminant validity of the scale. As per this criterion the values of the variable correlation with itself must be greater than the other variables in the same column. As per the table 2 all the values are satisfying the criterion which affirms the discriminant validity.

Table 3
Cross Loadings

	Att.	EI	EM	EWIL	NFS	NI	PBC	SN
Att.1	0.891	0.6	0.465	0.541	0.316	0.177	0.358	0.41
Att.2	0.832	0.59	0.454	0.442	0.343	0.225	0.449	0.584
Att.3	0.904	0.673	0.459	0.535	0.39	0.218	0.423	0.48
EI1	0.546	0.78	0.414	0.485	0.288	0.201	0.394	0.493
EI2	0.574	0.823	0.412	0.465	0.345	0.241	0.458	0.527
EI3	0.629	0.842	0.508	0.506	0.356	0.203	0.426	0.446
EI4	0.584	0.831	0.488	0.496	0.327	0.189	0.443	0.477
EI5	0.182	0.291	0.144	0.101	0.202	0.217	0.091	0.13
EM1	0.404	0.445	0.831	0.342	0.391	0.256	0.354	0.381
EM2	0.355	0.415	0.837	0.372	0.307	0.177	0.375	0.439
EM3	0.461	0.41	0.706	0.389	0.577	0.333	0.31	0.444
EM4	0.474	0.524	0.869	0.407	0.387	0.222	0.465	0.477
EWIL1	0.53	0.518	0.404	0.788	0.201	0.128	0.369	0.537
EWIL2	0.395	0.371	0.349	0.797	0.152	0.159	0.294	0.398
EWIL3	0.382	0.411	0.367	0.721	0.207	0.173	0.297	0.401
EWIL4	0.251	0.323	0.223	0.483	0.26	0.298	0.209	0.274
EWIL5	0.469	0.48	0.327	0.747	0.191	0.135	0.325	0.497
EWIL6	0.371	0.339	0.305	0.772	0.129	0.136	0.257	0.37
EWIL7	0.45	0.469	0.346	0.712	0.192	0.172	0.342	0.449
NFS1	0.423	0.379	0.515	0.288	0.854	0.374	0.231	0.357

Confirmatory factor analysis has been used to assess the measurement model. Confirmatory factor analysis provided the reliability, convergent and discriminant validity of the scales. Convergent validity is calculated based on three criteria namely; composite reliability, average variance extract and factor loadings.

As per the criterion the factor loading for each single item must be greater than 0.7. As per the table all the values for loadings are greater than 0.7. Some of the items which are related to the teaching proficiency were deleted as their loading value was less than 0.7. Out of total 32 items in the questionnaires 26 items were retained which established that 81% of the complete scale further will be used for data analysis.

Second criterion is the values of composite reliability. The value for this parameter must be greater than 0.80 then we can say that it do exist in scale. As per the findings shown in table 1 all the values for the composite reliability are more than 0.80 which satisfies the criterion. Furthermore third criterion is the values of average variance extract. Value for this criterion must be greater than 0.7. As per the table 1 values of AVE for all the variables under study are greater than 0.7 which affirms the AVE. As per the table 1 all the values for factor loadings, CR and AVE are within range which affirm the convergent validity of the scale. Furthermore, table 1 is also showing the values for the scale reliability which must be greater than 0.7. As per the table all the reliability values are under range which affirms the internal consistency of the scale.

Discriminant Validity

NFS2	0.163	0.223	0.25	0.089	0.596	0.407	0.051	0.079
NFS3	0.21	0.268	0.279	0.134	0.738	0.703	0.106	0.196
NI1	0.139	0.182	0.237	0.122	0.529	0.815	0.151	0.227
NI2	0.153	0.212	0.189	0.142	0.514	0.834	0.095	0.176
NI3	0.243	0.226	0.271	0.252	0.428	0.711	0.147	0.251
PBC1	0.443	0.491	0.453	0.382	0.192	0.159	0.921	0.519
PBC2	0.423	0.483	0.422	0.377	0.198	0.164	0.933	0.48
PBC3	0.43	0.466	0.418	0.414	0.177	0.15	0.915	0.536
SN1	0.449	0.5	0.444	0.589	0.26	0.267	0.529	0.885
SN2	0.557	0.581	0.522	0.437	0.322	0.234	0.463	0.833
SN3	0.371	0.36	0.362	0.479	0.233	0.211	0.391	0.801

Table 3 is showing the values for the cross loadings as per the parameter the cross loadings of a particular variables must be greater than all other variables in the same column. Findings reported in table 3 are satisfying the criterion which also strengthen the discriminant validity.

Table 4
HTMT

	Att.	EI	EM	EWIL	NFS	NI	PBC	SN
Att.	0.852							
EI	0.623	0.852						
EM	0.668	0.672	0.852					
EWIL	0.668	0.686	0.55	0.852				
NFS	0.486	0.59	0.649	0.321	0.852			
NI	0.294	0.389	0.389	0.296	1.008	0.852		
PBC	0.532	0.592	0.533	0.474	0.228	0.208	0.852	
SN	0.665	0.702	0.646	0.711	0.39	0.367	0.642	0.852

Present study has also used the latest technique to determine the discriminant validity which is HTMT. Heterotrait-Monotrait Correlation Ratio according to which all the values of correlation in the table must be less than 0.85. Table 4 findings are showing that all the values are less than 0.85 which affirms the discriminant validity of the scale.

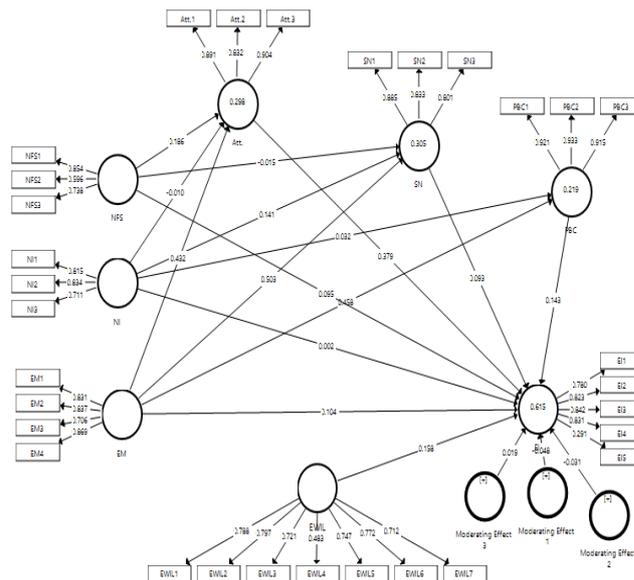


Figure 3

Table 5
Structural Equation Modeling

Relationships	B	SD	t value	p value
Att. -> EI	0.379	0.035	10.72	0.05
EM -> Att.	0.432	0.033	12.934	0.05
EM -> EI	0.104	0.034	3.081	0.00
EM -> PBC	0.458	0.035	13.009	0.00
EM -> SN	0.503	0.035	14.412	0.00
EWIL -> EI	0.158	0.032	4.904	0.00
NFS -> Att.	0.186	0.045	4.109	0.00
NFS -> EI	0.095	0.041	2.343	0.01
NFS -> SN	-0.015	0.045	0.331	0.370
NI -> Att.	-0.01	0.038	0.271	0.393
NI -> EI	0.002	0.031	0.05	0.480
NI -> PBC	0.032	0.033	0.994	0.160
NI -> SN	0.141	0.041	3.438	0.00
PBC -> EI	0.143	0.031	4.6	0.00
SN -> EI	0.093	0.039	2.345	0.01

Table 5 is showing the direct relationships between the variables. Some of the hypothesis of the present study are supported whereas some of the hypothesis are not supported. As per the findings reported in the table 5 economic motivations significantly influenced the attitude, subjective norms and perceived behavioral control which is valued at 0.432, 0.503 and 0.458 respectively. It means that individuals' behaviors change with their increasing motivation to get the finance.

Furthermore results also showed a significant relationship between need for success and attitude which is valued at

0.186. However the results did not report a significant relationship between need for success and subjective norms. In addition to this need for independence also not found be establishing a significant relationship with attitude. Notably, need for independence found to have positive significant relationship with the subjective norms and perceived behavioral control which is valued at 0.002 and 0.032 respectively.

Finally the results reported a significant relationship of attitude with entrepreneurial intentions valued at 0.379, subjective norms with entrepreneurial intentions valued at 0.093 and finally perceived behavioral control with entrepreneurial intentions valued at 0.143. Interestingly attitude found to be a stronger predictor for the entrepreneurial intentions.

Table 6
Specific Indirect Effects

Relationships	B	SD	t value	p value
EM -> Att. -> EI	0.164	0.02	8.162	0.050
NFS -> Att. -> EI	0.071	0.018	3.898	0.050
NI -> Att. -> EI	-0.004	0.015	0.269	0.394
EM -> PBC -> EI	0.066	0.015	4.4	0.050
NI -> PBC -> EI	0.005	0.005	0.952	0.171
EM -> SN -> EI	0.047	0.02	2.342	0.010
NFS -> SN -> EI	-0.001	0.004	0.331	0.370
NI -> SN -> EI	0.013	0.007	1.906	0.029

Table 6 is showing the findings of the study with regard to the mediation relationships between the variables. In this regarding it is notable that attitude did not proved to be a significant mediator between the relationship of need for independence and entrepreneurial intentions. Whereas perceived behavioral control and subjective norms also found not to be significant mediator between need for independence and entrepreneurial intentions. All other mediation relationships have been supported by the results of the study.

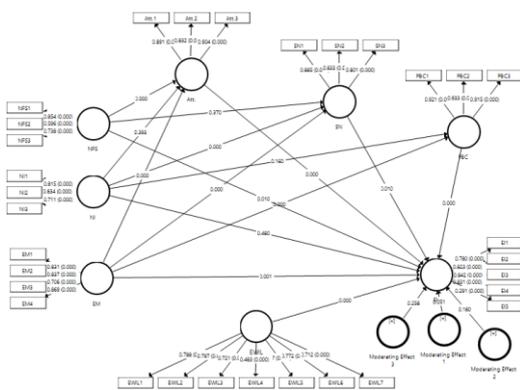


Figure 4

V. DISCUSSION

Having considered the importance of the engineering education the present study attempted to explore the factors which do influence the entrepreneurial intentions of the engineering students. In this regard study has used the lens of theory of planned behavior to understand the phenomenon. Few of the hypothesis of the study are not supported by the results of the study and therefore are not accepted. In this regard it is feasible to say that there may be some kind of cultural or language barrier for such findings. In addition to this it rarely happen that the norms of the society get influenced and tend to change. This could be the possible reason behind the rejection of various hypothesis belonged to especially the subjective norms variables. All other hypothesis are accepted.

Conclusion and Future Directions

On the conclusive remarks it can be stated that current study has made valuable contribution in the domain of entrepreneurship by studying the underlying factors from the lens of theory of planned behavior. Except few, majority of the study objectives have been accomplished. The study will serve as a potential guideline for the universities to redefine their course work in order to increase the entrepreneurial behaviors among the students.

1. The results of the study helped to understand the process of enhancing the entrepreneurial intentions.
2. The results of the study helped to understand the reasons or factors behind the entrepreneurial behaviors of the students. The factors identified are not the traditional factors which have already been widely studied and discussed.
3. From the findings of the study it is suggested that universities should understand and strive hard to motivate the students for the entrepreneurship in order to cope with the unemployment.
4. The teaching of the entrepreneurship course should be increased in order to have better outcomes in future.

Even though the study has accomplished all its objectives and majority of the hypothesis are supported, still there are few areas which remained unaddressed or poorly addressed and serve as a potential area for the future research. Future studies should consider more number of students from all universities. Future studies may compare the results of the very high quality and low quality universities to have better understating that these are the true factors which do impact the entrepreneurial intentions. Future studies should consider the underlying framework from the conservation resources theory to drive the determinants of the economic motivations.

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