



DRUID
ASIA

Paper to be presented at
DRUID-Asia, Singapore, February 23-25, 2016
Co-organized by DRUID, NUS Business School and SMU - Lee Kong Chian
School of Business.

University Entrepreneurship Education Programs and the Antecedents of Entrepreneurship Intention in Students

Yuen Ping Ho
National University of Singapore
NUS Entrepreneurship Centre, Research Division
yuenping@nus.edu.sg

Su Juan Crystal Ng
National University of Singapore
NUS Entrepreneurship Centre, Research Division
crystal_ng@nus.edu.sg

Pei Chin Low
NUS
SAW SWEE HOCK SCHOOL OF PUBLIC HEALTH
ephlpc@nus.edu.sg

Poh Kam Wong
National University of Singapore
NUS Entrepreneurship Centre, Research Division
PohKam@nus.edu.sg

Abstract

This paper investigates empirically the influence of entrepreneurship education programs (EEPs) on the association between antecedents of intention as put forth by the Theory of Planned Behaviour and students' level of entrepreneurial intention, with a particular focus on the distinction between traditional classroom-based and experiential education. We posit that classroom-based and experiential EEPs result in different learning outcomes (cognitive vs. affective) which in turn, interact with the antecedents of intention to influence entrepreneurial intentions differently. Using cross-sectional survey data from the 2011 Global University

Entrepreneurial Spirit Students' Survey (GUESSS) covering over 50,000 students at 171 institutions of higher learning in 23 countries, we examine the association of EEP participation with entrepreneurial intention through their influence on the students' attitude towards entrepreneurship, family background and perceived behavioural control. The results show that participation in EEP has both a direct and indirect influence on entrepreneurial intentions through their interaction effects with the antecedents of intention. Experiential learning, in particular, is found to be as effective as classroom-based EEPs in stimulating entrepreneurial behaviour. The findings have important practical implications for universities in designing EEPs on campus. The study supports the call to move towards a more balanced approach of having a more proportionate number of hands-on experiential programs compared to classroom-based programs, as a more effective way for educational institutions to influence students' entrepreneurial behaviour and encourage venture creation activity on campus.

University Entrepreneurship Education Programs and the Antecedents of Entrepreneurship Intention in Students

Abstract

This paper investigates empirically the influence of entrepreneurship education programs (EEPs) on the association between antecedents of intention as put forth by the Theory of Planned Behaviour and students' level of entrepreneurial intention, with a particular focus on the distinction between traditional classroom-based and experiential education. We posit that classroom-based and experiential EEPs result in different learning outcomes (cognitive vs. affective) which in turn, interact with the antecedents of intention to influence entrepreneurial intentions differently. Using cross-sectional survey data from the 2011 Global University Entrepreneurial Spirit Students' Survey (GUESSS) covering over 50,000 students at 171 institutions of higher learning in 23 countries, we examine the association of EEP participation with entrepreneurial intention through their influence on the students' attitude towards entrepreneurship, family background and perceived behavioural control. The results show that participation in EEP has both a direct and indirect influence on entrepreneurial intentions through their interaction effects with the antecedents of intention. Experiential learning, in particular, is found to be as effective as classroom-based EEPs in stimulating entrepreneurial behaviour. The findings have important practical implications for universities in designing EEPs on campus. The study supports the call to move towards a more balanced approach of having a more proportionate number of hands-on experiential programs compared to classroom-based programs, as a more effective way for educational institutions to influence students' entrepreneurial behaviour and encourage venture creation activity on campus.

1. INTRODUCTION

Extensive amount of extant literature on entrepreneurship have employed the use of intentional models in an attempt to increase the understanding and predictive ability of entrepreneurial activity. Studies have shown that student's entrepreneurship intentions and consequently, their propensity for entrepreneurial behaviour, are shaped by their attitudes towards entrepreneurship (van Gelderen et al., 2008).

As put forth by Ajzen (1991), attitudes are precursors to intentions which may be viewed as antecedents of actual behaviour as they capture the motivational factors that shape behaviour. Grounded on the Theory of Planned Behaviour, entrepreneurial intentions may thus be best predicted by attitudes (attitudes towards entrepreneurship, subjective norms and perceived behavioural control). These attitudes are in turn, argued to be influenced by 'exogenous factors' such as traits and situational variables which indirectly affects the students' entrepreneurial intentions and behaviour (Ajzen, 1991; Krueger et al., 2000). An excellent example of such 'exogenous factor' is the entrepreneurship education programs (EEPs), offered in institutions of higher learning (Souitaris et al., 2007).

The association of EEPs with entrepreneurial attitudes has been widely studied. Research on entrepreneurship education has suggested that attitudes are learned and thus attitudes towards entrepreneurship may be influenced through the development of more appropriate student centred EEPs. (Harris and Glibson, 2008) Others like Florin et al. (2007) have supported this view with the argument that EEPs have a stronger influence over attitudes as compared to personality traits since they

are learned and experience based. In fact, Peterman and Kennedy (2003) reported an increase in the perception of the desirability and feasibility of starting a business among students after their participation in EEPs.

With studies finding that entrepreneurial attitudes and skills may be learned, developed and refined through EEPs (Robinson et al., 1991; Mitra and Matlay, 2004), there has been a rapid increase in the number of EEPs offered in institutions of higher learning around the world. The GEM Special Report on Education and Training (2010) reported that entrepreneurship education and training has grown rapidly in recent decades among the nations surveyed. According to Katz (2003), the number of colleges and universities that offer courses related to entrepreneurship has grown from a handful in the 1970s to 1,600 in the United States alone.

Drawing on the Theory of Planned Behaviour, this study seeks to investigate the association of EEPs with the students' entrepreneurial intention, by positioning entrepreneurship education as an 'exogenous' influence on the antecedents of intention. Using data from a survey of over 50,000 students from 23 countries, we measure students' participation in university EEPs in two distinct forms; traditional classroom-based education and experiential programs. More importantly, we seek to ascertain the effectiveness of experiential EEPs in stimulating entrepreneurial behaviour as compared to classroom-based EEPs.

At a broader level, this paper contributes to the literature of entrepreneurship education by examining both traditional classroom-based and experiential EEPs which are suggested to result in differing learning outcomes (affective vs. cognitive). While the influence of entrepreneurship education has been examined extensively in the current literature, few have made the distinction between classroom-based and experiential EEPs and have not address the learning objectives nor the mechanisms through which learning outcomes are achieved in the programs. In his paper, Solomon (2007) observed a move towards the use of technology and guest speakers in entrepreneurship courses, indicating more collaborative sharing methods as replacements to traditional classroom approaches. This shift towards a more experiential learning approach in the mid-2000s is indicative of a need for a more thorough understanding of EEPs particularly in experiential learning which may be beneficial for further conceptual and theoretical development of EEPs, increasingly viewed as a mean to boost economic activity in countries today.

This paper is organized as follows. The next section briefly discusses the literature on the antecedents of entrepreneurial intention in individuals, paying particular attention to the role of entrepreneurship education. The subsequent sections develop the key research questions and hypotheses, and describe the methodology used, including the construction of measures. Next, the empirical results are presented and finally, implications and conclusions are discussed.

2. LITERATURE REVIEW: FACTORS INFLUENCING ENTREPRENEURIAL INTENTIONS

2.1 Theory of Planned Behaviour (TPB)

Entrepreneurial intention is the precursor to entrepreneurial behaviour, when individuals take steps to create new ventures. To understand the drivers of an individual's intentions and subsequent behaviour, entrepreneurship researchers have turned to the social psychology literature where the Theory of Planned Behaviour (Ajzen, 2002) has been used as the theoretical basis for many studies of human behaviour. According to the theory, human behaviour is guided by three types of beliefs,

namely behavioural beliefs, normative beliefs and control beliefs. Behavioural beliefs refer to the expected outcomes of a behaviour that produce a favourable or unfavourable attitude toward the behaviour; normative beliefs refer to perceived expectations of other people that result in perceived social pressure or subjective norms; and control beliefs refer to the presence of factors which may facilitate or impede the behaviour, affecting how the individual perceives the ease or difficulty of performing the behaviour. The combination of this set of beliefs leads to the formation of attitudes towards the object or event. Collectively referred to as 'attitudes', attitude towards the behaviour, subjective norm and perceived behavioural control are attitudinal constructs postulated as the antecedents of intention in the Theory of Planned Behaviour. When given sufficient degree of actual control over the behaviour, people are expected to carry out their intentions when there are opportunities. Thus, intention is assumed to be the immediate antecedent of behaviour.

The theory forms the basis of many theoretical and empirical studies of entrepreneurial intention in individuals (Krueger & Carsrud, 1993; Lee & Wong, 2004; Shapero, 1982; Van Gelderen et al., 2008). The combination of beliefs leads to the formation of entrepreneurship intention, which is the fundamental element to explain entrepreneurial behaviour and also indicates the effort to carry out the entrepreneurial behaviour (Linan, Rodriguez-Cohard & Rueda-Cantuche, 2011).

Both individual and institutional factors may shape the three antecedents of intention (attitude towards entrepreneurship, subjective norm and perceived behaviour control). Individual factors include the individual's psychological predisposition and attributes (Souitaris, Zerbinati & Al-Laham, 2007), and the individual's background and demographic profile (Crant 1996; Wang & Wong, 2004). Institutional factors may include environment-related constructs such as the ease of obtaining financing (Scholtens, 1999) and organizational factors that affect job satisfaction (Lee, Wong, Foo & Leung, 2011). The key institutional factor of interest in this paper, which is especially relevant in the context student entrepreneurship, is entrepreneurship education.

2.2 Entrepreneurship Education Programs (EEPs)

The scope of EEPs at universities has grown tremendously over the years (Katz, 2003). This expansion has been accompanied by increasing scrutiny of entrepreneurship education and its effectiveness. The empirical literature appears to advocate for the provision of EEPs on campus. Several studies have shown that EEPs raise the level of entrepreneurial interest among students (Vanevenhoven & Ligouri, 2013; Souitaris, Zerbinati & Al-Laham, 2007; Peterman & Kennedy, 2003).

Research on entrepreneurship education has constantly substantiated the influence of EEPs on attitudes. One of the earlier studies by Garnier et al. (1991) found that participant's attitudes towards entrepreneurship improved significantly after a Quebec-based televised training program. In particular, studies have shown that participation in EEPs may play an important role in influencing the behavioural and control beliefs of students. A number of studies have noted that students' perceptions on entrepreneurship have become more positive following their participation in EEPs (Pittaway and Cope, 2007; Kuratko, 2005) Others like Thursby, Fuller and Thursby (2009) reported that students who have attended EEPs possess higher competencies with more positive perceptions of the multidisciplinary capabilities needed to operate in a technological business environment. In addition, DeTienne and Chandler (2004) also found that students learn processes of opportunity identification and generate more innovative ideas following their attendance in EEPs. EEPs' influence over the antecedents of intention is further illustrated in the study by Krueger and Carsrud (1993). In their paper, they

highlighted that the 'perceived self-efficacy/control for entrepreneurial behaviour' related to one's control beliefs may be shaped by prior entrepreneurial exposure and the acquisition of management tools through EEPs. Similarly, participation in EEPs exposes the students to an environment of like-minded peers, professors and instructors in which social persuasion or positive encouragement and feedback may help to boost one's perceived behavioural control (Wilson et al. 2007). However, von Graevenitz, Harhoff and Weber (2010) showed that even though the EEPs have a significant positive effect on students' entrepreneurial skills and self-confidence, the courses reduce the number of students with founding intention.

In recent years, research has proposed that universities offer more experiential EEPs which allow students to be exposed to actual entrepreneurial environments as they learn on the ground (Vanevenhoven, 2013) or are guided by experienced entrepreneurs who had gone through the founding challenges and encountered failures (Kuratko, 2005). Several studies have illustrated that mastery experiences or rather 'learning by doing', has a defining role in affecting students' perceived behavioural control (Cox, Mueller & Moss, 2002). Rasmussen and Sorheim (2006) observed that EEPs which is focused less on classroom setting and more on learning-by-doing activities in group or network context at a Swedish universities resulted in more than 200 student start-ups during a period of five years. Vanevenhoven and Ligouri (2013) reported similar findings that EEPs motivate students' entrepreneurial intentions and self-efficacy. Interestingly, they also found that while the number of EEPs overall showed a significant positive correlation with the entrepreneurial behaviours of students, the number of extra-curricular activities specifically was not related to any of the behaviours. However, the authors did not provide possible explanations for this finding on the insignificance of extra-curricular entrepreneurship offerings. We suggest that the effects of extra-curricular activities may have been moderated by the course-based offerings, an interaction effect not examined in the study. The study also aggregated a number of different extra-curricular activities – business plan competitions, students clubs, guest speaker sessions and site visits, among others – into a single variable, hence possibly masking the effects of specific activities. This warrants further study to explore and confirm the relationships.

In summary, the literature generally agrees that EEPs can effectively shape entrepreneurial intentions by influencing the entrepreneurial attitudes. However, there is relatively little empirical work specifically on experiential learning, with available evidence being mixed as to the influence of such programs. This is in part due to differing outcome measures being used, and points to a need for more research into this area.

2.3 Affect vs. Cognition

2.3.1 Theory of Planned Behaviour

In Ajzen's (1991) Theory of Planned Behaviour, three attitudinal constructs are highlighted as antecedents of intention. While the definition of attitude varied according to authors, elements that constitute these definitions have remained largely similar. In general, 'attitude' is defined as the predisposition to respond in a positive or negative manner with respect to the attitude object (Ajzen, 1991), and has often been argued to be acquired or learned from the environment or situational variables. More importantly, besides a behavioural component, authors have suggested that attitudes are comprised of both an affective and cognitive component (Hawkins et al. 1983; Shaver, 1987). According to Rosenberg (1960, 1968), the affective component of entrepreneurial attitude refers to the individual's emotional reaction and feelings of performing a behaviour. The cognitive component is a

reflection of the individual's beliefs, thoughts and knowledge about the behavioural performance. When the affective-cognitive consistency of individuals is high, they are expected to display more stable attitudes which are postulated to be better predictors of behaviour compared to a low affective-cognitive consistency (Rosenburg, 1968).

2.3.2 Entrepreneurial Education

Although not explicitly stated, the prevalent focus of entrepreneurship education research is on the *cognitive* domain of learning. Cognitive learning pertains to task-relevant information, knowledge and understanding, and how knowledge, both factual and skill-based, is analysed and applied (Bloom and Krathwol, 1956; Kraiger et al, 1993). In the literature on educational psychology, researchers have acknowledged the importance of learning in another domain - the *affective* domain (Shephard, 2008). The affective domain pertains to emotions, values, attitudes and behaviours. In education, affective learning outcomes are related to motivations and emotions experienced by students while learning (Beard et al, 2007). Affective outcomes from education inculcate positive attitudes towards a subject and assist students in mastering cognitive aspects of their courses (Fletcher, 1958).

In the entrepreneurship literature, affect (ie. feelings and emotions) has been recognized as important in the entrepreneurial process, although research in this topic is still lacking (Foo, 2011). Mitchell et al (2007) stated that affect influences a variety of entrepreneurial cognitions and suggested that affect research from psychology offers a strong foundation for entrepreneurship researchers to probe the "thinking-doing" link in the entrepreneur's thought process. Much of the extant work on affect in entrepreneurship is conceptual rather than empirical. Baron (2008) proposes a framework that links dispositional and event-generated affect to key entrepreneurship aspects such as opportunity recognition and resource acquisition. Cardon et al (2009) argue that entrepreneurial "passion" is associated with distinctive and salient role identities that motivate entrepreneurs to engage in certain activities. Passion for entrepreneurship coordinates the cognition and behaviour of entrepreneurs, leading to effectiveness in opportunity recognition, venture creation and venture growth.

In contrast to the general entrepreneurship literature and the general education psychology literature, the question of affect and affective learning is under-explored in studies on entrepreneurship education. Many studies are silent on affect versus cognition and implicitly assume cognitive learning to be the influential mechanism of entrepreneurship education. Some studies include both cognitive and affective aspects in the choice of measures and variables, but do not distinguish between the two (Izquierdo and Buelens, 2011; Martin et al, 2013). In a meta-analysis of 42 studies on the outcomes of entrepreneurship education, Martin et al (2013) identified 18 studies that used positive perceptions of entrepreneurship as the criterion variable. As well-established in the education psychology literature, positive perceptions of a subject are induced by affective learning (Fletcher, 1958). However, the concept of affective learning has not been addressed in the majority of these studies on entrepreneurship education.

One rare exception is Souitaris et al (2007), who proposed "inspiration" as a benefit that students can derive from participation in EEPs, in addition to "learning" which is related to understanding and knowledge. They hypothesized that the greater the inspiration derived, the higher the increase in students' attitudes towards entrepreneurship post-program participation. While not couched in the same language, the Souitaris et al framework of "learning" and "inspiration" in effect addresses the cognitive and affective aspects of learning. The empirical findings suggest that specific events during

entrepreneurship education can trigger entrepreneurial passion. The authors argue that the study introduces an emotional angle to the entrepreneurship literature.

Another study that addresses affective learning, albeit briefly and indirectly, is Mueller (2011) which draws on concepts from education science to identify effective EEP characteristics that can increase entrepreneurial intention. Mueller (2011) hypothesized that inviting inspired entrepreneurs to serve as role models would accomplish affective learning goals, changing behaviours and attitudes by addressing students' emotions. The empirical findings showed that attitudes towards entrepreneurship were improved when students perceived invited entrepreneurs to be aspirational role models.

3. RESEARCH QUESTION AND HYPOTHESES

While the literature has extensively examined EEPs in general, there is a lack of empirical evidence examining the influence of experiential learning on students' level of entrepreneurial intention. The findings from the few extant studies are mixed or address entrepreneurship skills of students rather than intentions. Given the expansion of experiential EEPs globally, and the more extensive and specialized resources required to offer such programs; it is timely to investigate their relative effectiveness in stimulating entrepreneurship activities.

In this paper, we propose that classroom-based teaching leads to primarily cognitive learning outcomes which equip students with knowledge and skills which can be applied to tasks in the entrepreneurship process. Experiential EEPs can similarly confer cognitive learning outcomes but additionally and more importantly, we propose that experiential learning is primarily affective. This develops further the concept of "inspiration" in Souitaris et al (2007) and Mueller's (2011) hypothesis on affective effects of entrepreneurial role models. The affective characteristics of experiential learning enhance positive perceptions of entrepreneurship and sharpen cognition during the entrepreneurial process (Baron, 2008). As highlighted in the literature, several studies have suggested that attitudes are comprised of both an affective and cognitive component as well (Shaver, 1987; Rosenburg, 1960, 1968; Pulka et al., 2014). In consideration with the Theory of Planned Behaviour, we would expect that the attitudinal constructs put forth by the theoretical framework would similarly be associated with both an affective and cognitive component. As such, our paper seeks to examine the possible interaction effects between participation in EEPs and the attitudinal constructs, on the students' level of entrepreneurial intention.

Henceforth, the overarching research question in this study is whether students' participation in EEPs offered at universities positively influences the relation between antecedents of entrepreneurial intention and the students' level of entrepreneurial intention. The measure of entrepreneurial intention is described fully in the section on methodology.

Individual factors in our analysis are captured by the students' background and a set of attitude constructs derived from Ajzen's (2002) Theory of Planned Behaviour. These constructs reflect the salient beliefs employed to explain human behaviour in the theory.

Behavioural beliefs are measured firstly by the student's attitudes towards entrepreneurship, namely the degree to which the student views entrepreneurship in a positive light. Underlying this set of attitudes are psychological and personality traits unique to individual students, such as the degree of risk aversion (Cunningham, Gerrard, Chiang, Lim, & Siew, 1995) and pro-activeness (Crant, 1996). As concluded by Carsrud, Brannback, Elfving, and Brandt (2009), people shape their intentions to become entrepreneurs when they possess favourable attitudes towards entrepreneurial acts.

Given the influence of psychological traits on attitudes, we would expect students' attitudes towards entrepreneurship to interact with the proposed affective learning outcomes from experiential EEPs. In fact, research has shown that attitudes towards entrepreneurship can be altered (Robinson et al., 1991; Hatten and Ruhland, 1995; Harris and Gibson; 2008) and some (Renfrow and Watson, 2003; Audet, 2000) have suggested that participating in EEPs results in positive influences on entrepreneurial attitudes. More specifically, experiential EEPs which focuses on 'learning by doing' enable students to gain entrepreneurial experience by participating in running simulated or real businesses. As argued by Shapero and Sokol (1982), positive prior entrepreneurship exposure can positively influence individuals' attitudes towards entrepreneurship. In contrast, classroom-based EEPs provide opportunities for enhancing students' skills set and cognitive abilities in opportunity recognition - a key aspect in entrepreneurship. Such classroom-based EEPs have been suggested to improve the perceived desirability for entrepreneurship (Krueger and Brazeal, 1994).

In summary, students who are positively influenced by their participation in EEPs will likely be positively disposed towards entrepreneurship and thus expect positive outcomes from entrepreneurial behaviour. As such, we expect that the affective and cognitive learning outcomes of EEPs will augment the relation between students' impression of entrepreneurship and the level of entrepreneurial intention positively. This gives us the following hypothesis:

Hypothesis 1: *The association between students' impression of entrepreneurship and the level of entrepreneurial intention is positively influenced by both classroom-based and experiential entrepreneurship programs.*

A second measure of behavioural beliefs is the student's background, namely whether the student has parents who are entrepreneurial business owners. A number of studies have found that entrepreneurial or self-employed parents influence the entrepreneurial interest and career choice of their children (De Wit & Van Winden, 1989; Crant, 1996; Laspita et al. 2012). Two theoretical models have been forwarded to explain this effect: the parental role model and the family support model, with many studies confirming the former over the latter. An earlier study on Singapore university students by Wang and Wong (2004) similarly found a positive correlation and supported the parental role model, while rejecting the family support model. This is in line with the notion that behavioural beliefs about entrepreneurship are reinforced for those with entrepreneurial family backgrounds, because students look to their entrepreneur parents as positive examples of entrepreneurial behaviour. At the same time, this implies that the existence of a positive and successful parental role model will most likely influence the students' normative beliefs favourably given that entrepreneurship as a career choice is already an accepted norm within the family. Hence, students with family entrepreneurial background will be more likely to have a positive perception of other people's opinions of entrepreneurship.

In the framework of cognition versus affect, the parental role model suggests that the family background of students generates affective effects. Students from entrepreneurial families feel more positive emotions about entrepreneurship compared to their counterparts without the same exposure to entrepreneurship. In this regard, family background and experiential learning both lead to affective outcomes. As such, we posit that the association between students' family background and entrepreneurial intention is not influenced by experiential EEPs. On the other hand, classroom teaching leads to cognitive outcomes which do not overlap with the effect of family background. We therefore posit that the cognitive learning outcomes derived from participating in classroom-based EEPs would be a complement to the affective outcomes arising from students' family background. Thus, we propose

that classroom-based EEPs would strengthen the association between the students' family background and the level of entrepreneurial intention. This leads to the following contrasting hypotheses:

Hypothesis 2a1: *The association between students' family background and the level of entrepreneurial intention is positively influenced by classroom-based entrepreneurship programs.*

Hypothesis 2a2: *The association between students' family background and the level of entrepreneurial intention is not influenced by experiential entrepreneurship programs*

Control beliefs are measured by the student's perceived self-efficacy in various aspects of entrepreneurship. The concept of self-efficacy is well-established as an antecedent for entrepreneurial behaviour (Kruger, Reilly & Carsrud, 2000). Students with greater confidence in their own competence will be more ready to undertake the challenges of entrepreneurship. The use of role models which aid individuals in forming judgements of their own competence has been suggested to be able to raise students' perceived self-efficacy (Cox et al., 2002). Studies have also suggested that self-efficacy may be strengthened through social persuasion or from positive encouragement and feedback received from professors and instructors in EEPs (Wilson et al., 2007). As competence appears to pertain to the individual's knowledge, skills and confidence in their perceived abilities, our paper suggests that it is both a cognitive and an affective construct which we expect to interact with both cognitive and affective learning outcomes. Participating in either classroom-based or experiential EEPs would both be expected to enhance the students' level of self-efficacy and thus increase the students' level of entrepreneurial intention. Therefore, our last hypothesis is:

Hypothesis 3: *The association between students' perceived self-efficacy and the level of entrepreneurial intention is positively influenced by both classroom-based and experiential entrepreneurship programs.*

Apart from the students' attitudes and education, studies have found that other demographic characteristics also contribute to raising entrepreneurial intention levels. The gender (Minniti & Nardone, 2007) and age (Levesque & Minniti, 2006) of students are shown to play a role in affecting students' interest in entrepreneurship ventures. These additional measures are included as control variables and to improve goodness-of-fit of the analysis model.

4. METHODOLOGY

The dataset used for analysis is drawn from a survey of full-time students at the universities globally, undertaken as part of the Global University Entrepreneurial Spirit Students' Survey (GUESSS). GUESSS is an international research project that investigates students' entrepreneurial attitudes, intentions and activities across the world. The project was founded at the Swiss Research Institute of Small Business and Entrepreneurship at the University of St. Gallen, Switzerland in 2003. The project has completed five data collection waves up till 2011. GUESSS 2011 was administered through a common web-based questionnaire. More than 93,000 students from 489 institutions in 26 countries participated in the 2011 study.

The GUESSS questionnaire solicits information on the students' participation in a broad range of university EEPs, from traditional classroom-based education to experiential programs. Additionally, a range of questions seeks to ascertain students' interest and involvement in entrepreneurship activities.

The sample used in this study consists of 50,015 students from 171 universities in 23 countries. The sample excludes universities with less than 100 responses and includes only students who are aware of at least one experiential EEP and at least one classroom-based EEP; since program awareness necessitated as a prerequisite for program participation

We utilize linear regression models with students' intention taken as the dependent variable. In addition to entrepreneurship education, the regression analysis model includes psychological constructs developed by the GUESSS project to measure the sets of beliefs predicted by the Theory of Planned Behaviour to form intention and behaviour. In this study, our key predictors of interest are the interaction effects between entrepreneurship education and these influencing psychological factors. To improve the explanatory power of the model, other established antecedents of entrepreneurial intention, such as the personal background of students are also included as additional measures. As the linear regression model includes a number of interaction terms, all variables have been centred on the mean to control for possible issues with multi-collinearity.

4.1 Dependent variables

We use entrepreneurship intention as our dependent variable. The entrepreneurship intention measures how seriously students have considered becoming entrepreneurs. Using the construct from the GUESSS 2011 global report (Sieger, Fueglistaller & Zellweger, 2011), the lowest score of 1 is assigned to zero or sketchy intentions while the highest score of 10 is for active commitment (Table 1).

According to Stevenson, Roberts, and Grousbeck (1989), entrepreneurship is defined as the pursuit of opportunities by individuals, either on their own or inside organizations, without regard to the resources they control at that point. Aligned with the measures in the GUESSS project, entrepreneurial intentions in the GUESSS context therefore refer specifically to students' intentions of setting up their own businesses, rather than as a general indication of positive attitudes or interest.

4.2 Independent variables

The key predictors of interest are the interaction terms between students' participation in a broad range of EEPs offered by the university and the psychological constructs developed by the GUESSS project. The various EEPs are categorized into two groups; firstly, traditional classroom-based, and secondly, experiential education.

Participation in classroom-based EEPs. Student participation in classroom-based EEPs, such as lectures and seminars, is represented in binary form, with value 1 if the student attended at least one program and 0 if the student did not attend any program.

Participation in experiential-learning EEPs. Student participation in experiential EEPs in the form of workshops, mentoring, coaching and networking sessions is represented in binary form, with value 1 if the student participated in at least one experiential program and 0 if the student did not participate in any program.

Family background. The family background measure indicates the entrepreneurial experience of the student's parents. The presence of family entrepreneurial experience, in that either one or both of the parents have previously been or are currently self-employed business owners, is represented by a value of 1. A value of 0 represents parents with no entrepreneurial experience.

Impression of entrepreneurship. The students' attitudes towards entrepreneurship are measured by their implied impression of entrepreneurship; if entrepreneurship confers advantages or satisfactions, and the attractiveness of entrepreneurship as a career. Each impression item was measured on a 7-point Likert scale, with higher points for more favourable impressions. The construct used in the regression model is the average of ratings given to different possible impressions of entrepreneurship. The construct reliability was confirmed with Cronbach's alpha value of 0.921 for the four items measuring impression of entrepreneurship.

Competence. The students rated the perception of their own competence in performing various entrepreneurship-related roles or tasks on a 7-point Likert scale, with higher ratings for greater certainty in their self-efficacy. The roles or tasks evaluated include conceptualization of business, products and services developments, financial and risk management, time management, and leadership responsibility. We averaged the scores for the ratings across the different roles to represent the student's overall self-efficacy. The Cronbach's alpha for perceived overall competence, combining eleven items is 0.901, confirming reliability of the construct.

Control variables. The three control variables included in the analysis are gender (Female = 1; Male = 0), age of the student, course of study (Business Degree = 1; Non-Business Degree = 0), country effects, and university effects.

5. RESULTS

Table 3 shows the profile of the global students used in this analysis. Among the 50,015 students from the sample, 46.8% are male students and 27.5% are studying for a Business degree. Almost half of the students come from families with either or both parents who are or were previously business-owners. In terms of university EEPs, 65.9% of the students have participated in classroom-based EEPs while a smaller proportion, 51.5% have participated in experiential EEPs. Close to half (47.6%) of the students in the sample expressed entrepreneurial intentions, with a higher percentage of male students (55.6%) having at least given repeated and considered thought to founding their own businesses as compared to female students (40.7%). Comparisons between countries further demonstrate that a larger percentage of students from non-OECD countries (51.8%) have expressed intentions in entrepreneurship as compared to students in OECD countries (42.5%). A more detail profile of students by country is presented in Appendix 1. Table 4 shows the bivariate Pearson correlations for all variables used in the regression analysis. The correlation coefficients suggest that there is no multicollinearity among the predictors and control variables. This is confirmed by collinearity diagnostics in all regression equations, with maximum Variance Inflation Factor (VIF) values well below the threshold level of 10 (Powers and McDougall, 2005) for all variables.

Table 5 provides the results of the linear regression explaining the students' entrepreneurial intentions. Model 1 is the base model that includes all the control variables. Results showed that female students have less intention of engaging in entrepreneurial ventures (Table 4; $B = -0.61$, $p < 0.01$) compared to male students. Meanwhile, the students who are more senior in age ($B = 0.04$, $p < 0.01$) and students who are majoring in Business ($B = 0.24$, $p < 0.01$) in the university are reported to have stronger entrepreneurship intention to found their own companies. Model 2 shows the relation between the antecedents of intention and the students' levels of entrepreneurial intention while Model 3 illustrates our key interest, the interaction effects of participation in EEPs and the antecedents of intention.

Aligned with previous studies, family entrepreneurial experience is positively associated with students' entrepreneurial intentions ($B = 0.32, p < 0.01$). Similarly, the psychological constructs were significant and exhibited the expected directions of influence. Attitude toward entrepreneurship, measured by students' impression of entrepreneurship, is positively related to the entrepreneurial intentions ($B = 0.42, p < 0.01$) while perceived behavioural control, measured by students' self-efficacy, is also strongly and positively associated with entrepreneurial intentions ($B = 0.30, p < 0.01$).

From our results in Model 3, the interaction effect of EEPs with students' attitudes toward entrepreneurship is revealed to be positive and significant ($B = 0.05, p < 0.01$ for classroom-based programs; $B = 0.04, p < 0.01$ for experiential programs). This confirms our Hypothesis 1 that the association of students' impression of entrepreneurship with level of entrepreneurial intention is positively influenced by participation in both classroom-based and experiential EEPs.

More importantly, we found that participation in classroom-based EEPs is shown to have a positive and significant influence on the relation between students' family entrepreneurial experience and entrepreneurial intentions ($B = 0.06, p < 0.10$). In contrast, the interaction effects of experiential EEP participation with family entrepreneurial experience are positive but not significant. Hence, we find support for both Hypotheses 2a1 and Hypothesis 2a2. The association between students' family entrepreneurial experience and entrepreneurial intention is positively influenced by students' participation in classroom-based EEPs, and no such effect is observed for experiential learning.

In the case of perceived self-efficacy, the interaction terms for both classroom-based and experiential EEPs are discovered to be insignificant. Hence, we reject hypothesis 3 and conclude that the association between students' perceived self-efficacy and level of entrepreneurial intention is not influenced by participation in either classroom-based or experiential EEPs.

Lastly, our results in Table 5 reveal that in addition to the interaction effects, participation in EEPs are noted to have a positive and significant influence on the level of entrepreneurial intention directly ($B = 0.11, p < 0.01$ for classroom-based programs and $B = 0.12, p < 0.01$ for experiential programs). The T-test comparing the estimated coefficient values on the two EEPs shows significantly higher estimated coefficient value for experiential learning. Participating in experiential EEPs is associated with a higher level of entrepreneurial intention, implying that experiential learning may be slightly more effective in stimulating entrepreneurial behaviour compared to classroom-based EEPs.

6. DISCUSSIONS & CONCLUSIONS

One of the key aims of this study is to examine the influence of classroom-based and experiential EEPs on the relation between antecedents of intention and the students' level of entrepreneurial intention. We attempted to provide an alternative perspective on the literature of entrepreneurship education by positing that classroom-based EEPs result in primarily cognitive learning outcomes while experiential EEPs is primarily affective. Through this paper, we seek to ascertain the effectiveness of EEPs particularly experiential learning and to determine if equal attention should be placed on experiential EEPs in entrepreneurship education to encourage greater entrepreneurship behaviour.

We confirm the influence of entrepreneurship education not only on entrepreneurial intentions directly but more importantly, indirectly through their interactions with the antecedents of intention. This suggests that the overall effectiveness of EEPs is still very much conditional on the students' attitudes and perceptions. The significant and positive relationship between program participation and

entrepreneurial intention shows that entrepreneurship education encourages entrepreneurial behaviour in students. This result affirms previous literature on the association between entrepreneurship education and students' entrepreneurial intentions (Peterman & Kennedy, 2003; Souitaris et al., 2007).

A key finding from our analysis is that experiential learning is found to be as effective in influencing the antecedents of intention as classroom-based EEPs. Results from our paper demonstrated that both classroom-based and experiential EEPs are shown to influence the students' impression on entrepreneurship positively in the same manner. Both programs are also found to be positively and significantly related to entrepreneurial intentions directly as well. In fact, experiential learning is noted to have a slightly stronger direct association with entrepreneurial intention. Interestingly, only classroom-based EEPs are found to have a positive influence on the association between students' family entrepreneurial background and level of entrepreneurial intentions. As argued in our paper, classroom-based EEPs are proposed to result in primarily cognitive learning outcomes and this is suggested and proven from our results, to complement the affective outcomes from students' family entrepreneurial background to increase entrepreneurial intentions.

Given that the bulk of EEPs in universities are still largely based on classroom-based teaching with cognitive learning assumed to be the influential mechanism of entrepreneurship education, our findings on the effectiveness of experiential learning has important practical implications for universities in designing their EEPs on campus. While classroom-based courses form a useful baseline for students who participate in entrepreneurship programs, the positive significant effect of experiential learning attests to the influence of hands-on EEPs and suggests that universities should give equal consideration to experiential learning when prioritizing their resource allocation. Experiential EEPs may thus act as a complement to classroom-based EEPs to strengthen the impact of entrepreneurship education on entrepreneurial intentions since the programs appear to target the development of different types of skills and psychological traits in students. Rather than setting unrealistic targets, a more useful strategy for the university could be to focus on offering more programs that provide meaningful hands-on entrepreneurship experience to complement the bulk of EEPs largely based on theoretical content in entrepreneurship education in institutions of higher learning today.

Furthermore, one of the social psychology constructs in our study, namely impression on entrepreneurship, was found to be more influential in explaining entrepreneurial intention. Taken together with the finding on the significance of entrepreneurship education, this suggests opportunities for the university to provide training to develop the entrepreneurship capabilities and inculcate positive attitudes towards entrepreneurship among students. By equipping students with the necessary expertise, skills and networks, the university can play an active role in alleviating students' uncertainties and instilling them with greater confidence in their ability to set up their own businesses.

Our findings appear to vindicate the decisions made by some universities to invest significant resources in immersive programs, providing opportunities for in-depth engagement with actual start-ups and entrepreneurs. The study by Ho, Low, & Wong (2014), using single university as sample, shows that not only that experiential learning has significantly higher impact on entrepreneurial engagement than classroom-based programs, it was the strongest determinant among all the included predictors of entrepreneurial engagement; highlighting the very important roles played by experiential programs in students' entrepreneurship journey.

In terms of the paper's contribution to extant literature on entrepreneurship education, our results are consistent with studies by Souitaris, Zerbinati and Al-Laham (2007) and Peterman and Kennedy (2003) that EEPs raise students' entrepreneurial intentions. More importantly, the results provide empirical

support for Vanevenhoven's (2013) suggestion to send students out into actual start-up environments to help them in their entrepreneurship journey. Our results also support Rasmussen and Sorheim's (2006) study that entrepreneurship education that focuses on active involvement by the students lead to actual venture creation.

One limitation of our study which could be addressed with further research is the inability to fully capture normative beliefs in the Theory of Planned Behaviour. Due to the nature in which normative beliefs are formed and it being influenced by factors such as the individuals' internal locus of control and action orientation, measure of normative beliefs is complex and challenging. Moreover, GUESS data does not have a suitable measure of normative beliefs to allow for the study of its interaction effects with entrepreneurship education in the context of our study. Another limitation would be the possible reverse causality. Like other prior studies in the literature (Peterman & Kennedy, 2003; Raposo et al., 2008; Sanchez, 2011; Souitaris et al., 2007), our analysis methodology suffers from the limitation that students may have a predisposition toward entrepreneurship prior to their participation in EEPs.

In summary, the study contributes to the ongoing discussion about the form of academic EEPs which may potentially influence the students' choice of an entrepreneurial career path. The study supports the call to move towards a more balanced approach of having a more proportionate number of hands-on experiential EEPs compared to classroom-based EEPs, as a more effective way for educational institutions to influence students' entrepreneurial behaviour and encourage venture creation activity on campus.

REFERENCES

- Ajzen, I. (1991). The theory of planned behaviour. *Organizational Behaviour and Human Decision Processes*, 50, 179-211.
- Ajzen, I. (2002). Perceived behavioural control, self-efficacy, locus of control, and the theory of planned behaviour. *Journal of Applied Social Psychology*, 32(1), 1-20.
- Audet, J. (2000). Evaluation of two approaches to entrepreneurial education using an intentions-based model of venture creation. *Academy of Entrepreneurship Journal*, 6(1), 57-63.
- Bandura, A. (1986). *The Social Foundations of Thought and Action*. Englewood Cliffs, NJ: Prentice Hall.
- Baron, R.A. (2008). The role of affect in the entrepreneurial process. *Academy of Management Review*, 33(2), 328-340.
- Beard, C., Clegg, S. and Smith, K. (2007). Acknowledging the affective in higher education. *British Educational Research Journal*, 33(2), 235-52.
- Bird, B. (1988). Implementing entrepreneurial ideas: The case for intention. *Academy of Management Review*, 13(3), 442-453.
- Bloom, B.S. and Krathwol, D.R. (1956) *Taxonomy of Educational Objectives: The Classification of Educational Goals*. David McKay: New York, NY.
- Boocock, G., Frank, R. and Warren, L. (2009). Technology-based entrepreneurship education: meeting educational and business objectives. *The International Journal of Entrepreneurship and Innovation*, 10(1), 43-53.
- Boyd, N.G. & Vozikis, G.S. (1994). The influence of self-efficacy on the development of entrepreneurial intentions and actions. *Entrepreneurship Theory and Practice*, 18(4), 63-77.
- Cardon, M.S., Wincent, J., Singh, J., & Drnovsek, M. (2009). The nature of entrepreneurial passion. *Academy of Management Review*, 34, 511-532.
- Carsrud, A., Brannback, M., Elfving, J. and Brandt, K. (2009). Motivations: The entrepreneurial mind and behaviour. In A.L. Carsrud and M. Brannback (eds.), *Understanding the entrepreneurial mind: Opening the black box* (pp. 141-165). International Studies in Entrepreneurship, 24. New York, NY: Springer Science+Business Media, LLC.
- Cox, L, Mueller, S. and Moss, S. (2002). The impact of entrepreneurship education on entrepreneurial self-efficacy. *International Journal of Entrepreneurship Education*, 1, 2.
- Crant, J. M. (1996). The proactive personality scale as a predictor of entrepreneurial intentions. *Journal of Small Business Management*, 34 (3), 42-49.

Cunningham, B., Gerrard, P., Chiang, F.P., Lim, K.Y., and Siew, C.L. (1995). Do undergraduates have what it takes to be entrepreneurs and managers of small businesses in Singapore? *Journal of Asian Business*, 11(4), 35–49.

Delmar, F. and P. Davidson (2000). Where do they come from? Prevalence and characteristics of nascent entrepreneurs. *Entrepreneurship & Regional Development*, 12, 1-23.

De Wit, G. and Van Winden, F. A. (1989). An empirical analysis of self-employment in the Netherlands. *Small Business Economics*, 1(4), 263–272.

DeTienne, D. R. and Chandler, G. H. (2004). Opportunity identification and its role in the entrepreneurial classroom: A pedagogical approach and empirical test. *Academy of Management Learning and Education*, 3(3), 242–257.

Fletcher, F.M. (1958). An approach to the problem of teaching effectiveness. In W.J. McKeachie (Ed.) *The appraisal of teaching in large universities*. Ann Arbor: University of Michigan.

Florin, J., Karri, R. and Rossiter, N. (2007). Fostering entrepreneurial drive in business education: an attitudinal approach. *Journal of Management Education*, 31(1), 17-42.

Foo, M.D. (2011). Emotions and Entrepreneurial Opportunity Evaluation. *Entrepreneurship Theory and Practice*, 35(2), 375-393.

Garnier, B., Gasse, Y. and Raynal, C. (1991). Evaluation of a televised course in entrepreneurship. *Journal of Small Business Economics*, 9(1), 25-34.

Grilo, I. and A.R. Thurik. (2005b). Entrepreneurial engagement levels in the European Union. *International Journal of Entrepreneurial Education*, 3(2), 143-168.

Hatten, T.S. and Ruhland, S.K. (1995). Student attitude towards entrepreneurship as affected by participation in an SBI program. *Journal of Education for Business*, 70(4), 224-248.

Harris, M. and Gibson, S.G. (2008). Examining the entrepreneurial attitudes of US business students. *Education and Training*, 4(1), 35-50.

Hawkins, D.I., Best, R.J. and Comey, K.A. (1983). Consumer behaviour-implications for marketing strategy. Revised Edition, business publications incorporated Plano, Texas.

Ho, Y. P., Low, P. C. and Wong, P. K. (2014). Do university entrepreneurship programs influence students' entrepreneurial behaviour? An empirical analysis of university students in Singapore. In S. Hoskinson and D. F. Kuratko (eds), *Advances in the Study of Entrepreneurship, Innovation, and Economic Growth*, 24 (pp. 65-87). United Kingdom: Emerald Group Publishing Limited.

Hytti, U. and O'Gorman, C. (2004). What is 'enterprise education'? An analysis of the objectives and methods of enterprise education programmes in four European countries. *Education & Training*, 46(1), 11-23.

Hytti, U., Stenholm, P., Heinonen, J. and Seikkula-Leino, J. (2010). Perceived learning outcomes in entrepreneurship education. The impact of student motivation and team behaviour. *Education and Training*, 52(89), 587-606.

Izquierdo, E. and Buelens, M. (2011). Competing models of entrepreneurial intentions: the influence of entrepreneurial self-efficacy and attitudes. *International Journal of Entrepreneurship and Small Business*, 13(1), 75-91.

Johannisson, B. (1991). University training for entrepreneurship: a Swedish approach. *Entrepreneurship and Regional Development* 3 (1), 67–82.

Katz, J. A. (2003). The chronology and intellectual trajectory of American entrepreneurship education. *Journal of Business Venturing*, 18(2), 283-300.

Kraiger, K., Ford, J. K., & Salas, E. (1993). Application of cognitive, skill-based, and affective theories of learning outcomes to new methods of training evaluation. *Journal of Applied Psychology*, 78, 311–328.

Krueger, N. and Carsrud, A. (1993). Entrepreneurial intentions: Applying the theory of planned behaviour. *Entrepreneurship and Regional Development*, 5, 315–330.

Krueger, N. and Brazeal, D. (1994). Entrepreneurial potential and potential entrepreneurs. *Entrepreneurship Theory and Practice*, 18(3), 91-94.

Krueger, N. F., Reilly, M. D. & Carsrud, A. L. (2000). Competing models of entrepreneurial intentions. *Journal of Business Venturing*, 15(5-6), 411– 432.

Kuratko, D.F., & Hodgetts, R.M. (2001). *Entrepreneurship, a contemporary approach* (5th ed.). Florida: Hartcourt College Publishers.

Kuratko, D. F. (2005). The emergence of entrepreneurship education: Development, trends and challenges. *Entrepreneurship Theory and Practice*, 29(5), 577-598.

Laspita, S., Breugst, N., Heblich, S., & Patzelt, H. (2012). Intergenerational transmission of entrepreneurial intentions. *Journal of Business Venturing*, 27 (4), 414-435.

Lee, L., Wong, P. K., Foo, M. D., & Leung, A. (2011). Entrepreneurial intentions: The influence of organizational and individual factors. *Journal of Business Venturing*, 26(1), 124-136.

Lee, S. H., & Wong, P. K. (2004). An exploratory study of technopreneurial intention: A career anchor perspective. *Journal of Business Venturing*, 19(1), 7-28.

Levesque, M. and Minniti, M. (2006). The effect of aging on entrepreneurial behaviour. *Journal of Business Venturing*, 21(2), 177–194.

Linan, F., Rodriguez-Cohard, J. C. and Rueda-Cantuche, J. M. (2011). Factors affecting entrepreneurial intention levels: A role for education. *International Entrepreneurship and Management Journal*, 7(2), 195-218.

- Martin, B, McNally, J.J., Kay, M. (2013). Examining the Formation of Human Capital in Entrepreneurship : A Meta-Analysis of Entrepreneurship Education Outcomes. *Journal of Business Venturing*, 28 (2), 211-224.
- Martin, B. C., McNally, J. J., and Kay, M. J. (2013).Examining the formation of human capital in entrepreneurship: A meta-analysis of entrepreneurship education outcomes.*Journal of Business Venturing*, 28 (2), 211-224.
- Martinez, A. C., Levie, J., Kelley, D. J., Saemundsson, R. J. and Schott, T. (2010).*Global Entrepreneurship Monitor (GEM) special report: A global perspective on entrepreneurship education and training*. The Global Entrepreneurship Research Association (GERA). London, UK.
- Minniti, M. and Nardone, C. (2007).Being in someone else’s shoes: Gender and nascent entrepreneurship.*Small Business Economics*, 28(2), 223–238.
- Mitchell, R.K., Busenitz, L., Bird, B., Gaglio, C.M., McMullen, J.S., Morse, E.A., et al. (2007). The central question in entrepreneurial cognition research.*Entrepreneurship Theory and Practice*, 31, 1–27.
- Mitra , J. and Matlay, H. (2004). Entrepreneurial and vocational education and training: lessons from eastern and central Europe. *Industry and Higher Education*, 18(1), 53-69.
- Mueller, S. (2011).Increasing entrepreneurial intention: effective entrepreneurship course characteristics.*International Journal of Entrepreneurship and Small Business*, 13 (1), 55-74.
- Peterman, N. E. and Kennedy, J. (2003). Enterprise education: Influencing students’ perceptions of entrepreneurship. *Entrepreneurship Theory and Practice*, 28(2), 129-144.
- Pittaway, L. and Cope, J. (2007). Entrepreneurship education: a systematic review of the evidence. *International Small Business Economics*, 9(5), 449-462.
- Powers, J.B., Mcdougall, P.P., 2005. University start-up formation and technology licensing with firms that go public: A resource-based view of academic entrepreneurship. *Journal of Business Venturing*, 20, 291-311.
- Pulka, B.M., Riwentishe, R. and Ibrahim, B. (2014). An evaluation of students' attitude towards entrepreneurship education in some selected universities in north east Nigeria. *Global Journal of Management and Business Research*, 14(8A).
- Raposo, M. L. B., Ferreira, J. J. M., Do Paco, A. M. F. and Rodrigues, R. J. A. G. (2008). Propensity to run firm creation: empirical research using structural equations. *International Entrepreneurship and Management Journal*, 4, 485-504.
- Rasmussen, E. A. and Sorheim, R. (2006).Action-based entrepreneurship education.*Technovation*, 26, 185–194.
- Robinson, P.B., Stimpson, D.V., Huefner, J.C. and Hunt, H.K. (1991).An attitude approach to the prediction of entrepreneurship.*Entrepreneurship Theory & Practice*, 15(4), 13-31.

- Rosenberg, M.J. (1960). A structural theory of attitude dynamics. *Public Opinion Quarterly*, 24, 319-341.
- Rosenberg, M.J. (1968). Hedonism, inauthenticity, and other goals toward expansion of a consistent theory. In R.P. Abelson, E. Aronson, W.J. McGuire, T.M. Newcomb, M.J. Rosenberg, & P.H. Tannenbaum (Eds.), *Theories of cognitive consistency: A sourcebook*, 73-111, Chicago: Rand McNally.
- Sanchez, J. C. (2011). The impact of an entrepreneurship education program on entrepreneurial competencies and intention. *Journal of Small Business Management*, 51(3), 447-465.
- Scholtens, B. (1999). Analytical issues in external financing alternatives for SBEs. *Small Business Economics*, 12, 137-148.
- Shapero, A. (1975). The displaced, uncomfortable entrepreneur. *Psychology Today*, November 9, 83–88.
- Shapero, A. and Sokol, L. (1982). Social dimensions of entrepreneurship. In Kent, C.A., Sexton, D.L. and Vesper, K.H. (Eds.). *Encyclopaedia of entrepreneurship*, Prentice Hall, Englewood Cliffs, NJ, 72-90.
- Shaver, K.G. (1987). *Principles of Social Psychology*. 3rd Ed, Winthrop, Cambridge, MA.
- Shephard, K. (2008). Higher education for sustainability: seeking affective learning outcomes. *International Journal of Sustainability in Higher Education*, 9(1), 87-98.
- Sieger, P., Fueglistaller, U. and Zellweger, T. (2011). *Entrepreneurial intentions and activities of students across the world*. International report of the GUESSS project 2011. St.Gallen: Swiss Research Institute of Small Business and Entrepreneurship at the University of St.Gallen (KMU-HSG).
- Solomon, G. (2007). An examination of entrepreneurship education in the United States. *Journal of Small Business and Enterprise Development*, 14(2), 168-182.
- 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*, 22, 566-591.
- Stevenson, H. H., M.J. Roberts and H.I. Grousbeck. *New Business Ventures and the Entrepreneur*, Irwin, Homewood, IL, 1989.
- Thursby, M. C., Fuller, A. W. and Thursby, J. (2009). An integrated approach to educating professionals for careers in innovation. *Academy of Management Learning & Education*, 8(3), 389–405.
- Trenan, J., Renfrow, P. and Watson, B. (2003). Situational Factors and Entrepreneurial Intentions. A Paper Presented at the 16th Annual Conference of Small Enterprise Association of Australia 28th September – 1st October.
- Van Gelderen, M., Brand, M., Van Praag, M., Bodewes, W., Poutsma, E. and Van Gils, A. (2008). Explaining entrepreneurial intentions by means of the theory of planned behaviour. *Career Development International*, 13(6), 538-559.

Vanevenhoven, J. (2013). Advances and challenges in entrepreneurship education. *Journal of Small Business Management*, 51(3), 466-470.

Vanevenhoven, J. and Ligouri, E. (2013). The impact of entrepreneurship education: Introducing the entrepreneurship education project. *Journal of Small Business Management*, 51(3), 315–328.

Von Graevenitz, G., Harhoff, D., Weber, R. (2010). The effects of entrepreneurship education. *Journal of Economic Behaviour and Organization*, 76(1), 90–112.

Wang, C. K. and Wong, P. K. (2004). Entrepreneurial interest of university students in Singapore. *Technovation*, 24, 163-172.

Wilson, F., Kickul, J. and Marlino, D. (2007). Gender, Entrepreneurial Self-Efficacy, and Entrepreneurial Career Intentions: Implications for Entrepreneurship Education. *Entrepreneurship Theory and Practice*, 31(3), 387-406.

Zhao, H., Seibert, S.E., & Hills, G.E. (2005). The mediating role of self-efficacy in the development of entrepreneurial intentions. *Journal of Applied Psychology*, 90: 1265–1272.

TABLES

Table 1 Strength of Entrepreneurial Intentions

Entrepreneurial Intentions	Score
(how seriously students have considered becoming entrepreneurs)	
Never or Sketchily	1
Repeatedly to Relatively concrete	3
Have made an explicit decision to be an entrepreneur	5
Have concrete time plan or have already started with realization	7
Active entrepreneur in self-founded firm	8
Active entrepreneur with multiple self-founded firms	10

Table 2 Steps Undertaken to Actualize Entrepreneurial Intentions

Steps Undertaken to Actualize Entrepreneurial Intentions	Score
Nothing done so far	1
Thought of first business ideas	3
Formulated business plan	5
Identified market opportunity	5
Looked for potential partners	5
Purchased equipment	7
Worked on product development	7
Discussed with potential customers	7
Asked institutions for funding	8
Decided on date of foundation	10

Table 3 Profile of Respondents

Number of respondents	50,015
% Male	46.8
% studying for Business Degree	27.5
% with entrepreneurial intention	47.6
% who have at least given repeated and considered thought to founding their own businesses	
Males	55.6
Females	40.7
OCED countries	42.5
Non-OCED countries	51.8
% who have taken at least one step in the entrepreneurial process	38.5
% with scores of more than 10 for founding steps taken	
Males	37.4
Females	25.4
OCED countries	28.4
Non-OCED countries	34
% who have participated in classroom based entrepreneurship programs	65.9
% who have participated in experiential entrepreneurship programs	51.5
% with entrepreneurial family background	47.4

Table 4: Correlation Matrix

	Age	Gender	Course of Study (Biz=1)	Participation in classroom program	Participation in experiential program	Family business background	Impression on entrepreneurship	Competence	Entrepreneurial Intentions
Age	1								
Gender	-0.07**	1							
Course of Study (Biz=1)	0.00	0.01	1						
Participation in classroom program	0.01**	-0.05**	0.23**	1					
Participation in experiential program	-0.01**	-0.02**	0.13**	0.42**	1				
Family business background	-0.01*	-0.02**	0.05**	0.07**	0.07**	1			
Impression on entrepreneurship	0.04**	-0.12**	0.13**	0.20**	0.18**	0.16**	1		
Competence	0.10**	-0.12**	0.11**	0.20**	0.19**	0.15**	0.59**	1	
Entrepreneurial Intentions	0.12**	-0.16**	0.06**	0.13**	0.12**	0.15**	0.44**	0.35**	1

N= 50015 ** Correlation is significant at the 0.01 level (2-tailed) *Correlation is significant at the 0.05 level (2-tailed)

Table 5 Estimated Linear Regressions for Entrepreneurial Intentions

	Model 1		Model 2		Model 3	
	B	Sig.	B	Sig.	B	Sig.
Control Variables						
(Constant)	1.75***	0.00	1.25***	0.00	1.24***	0.00
Gender	-0.61***	0.00	-0.35***	0.00	-0.35***	0.00
Age	0.04***	0.00	0.04***	0.00	0.04***	0.00
Course of study	0.24***	0.00	0.03*	0.06	-0.002	0.90
Country fixed effects	(details not provided)					
University effects	(details not provided)					
Predictors						
Family background			0.32***	0.00	0.32***	0.00
Impression of Entrepreneurship			0.42***	0.00	0.42***	0.00
Competence			0.30***	0.00	0.28***	0.00
Participation in classroom-based programs					0.11***	0.00
Participation in experiential programs					0.12***	0.00
Interactions						
Participation in classroom-based programs * Family background					0.06*	0.08
Participation in classroom-based programs * Impression of Entrepreneurship					0.05***	0.00
Participation in classroom-based programs * Competence					0.02	0.33
Participation in experiential programs * Family background					0.03	0.38
Participation in experiential programs * Impression of Entrepreneurship					0.04***	0.00
Participation in experiential programs * Competence					-0.01	0.61
Adjusted R ²	0.08		0.26		0.26	
F-value	25.18		96.95		94.24	
n	50015		50015		50015	

*Significant at 10%; **Significant at 5%; ***Significant at 1%.

Appendix 1

Table A Profile of Sample by Country

No	Country	Sample Size				Proportion with Entrepreneurial Intention		Proportion of students taken at least one founding step		Proportion participated in experiential programs		participation in classroom programs	
		Total Sample Size	Number of universities	Average Sample Size per University	Range of Sample Size of Universities	Average	Range	Average	Range	Average	Range	Average	Range
1	Brazil	16353	26	629	46 - 8998	51%	39% - 59%	43%	34% - 55%	59%	43% - 84%	72%	58% - 96%
2	Netherlands	7945	17	467	76 - 1541	39%	27% - 59%	31%	20% - 53%	53%	34% - 81%	65%	44% - 86%
3	Germany	6399	24	267	60 - 766	43%	32% - 71%	33%	25% - 62%	33%	16% - 60%	43%	25% - 65%
4	Switzerland	3670	20	184	16 - 900	49%	19% - 66%	38%	19% - 57%	46%	15% - 97%	58%	25% - 87%
5	Hungary	2945	15	196	39 - 421	50%	43% - 65%	37%	26% - 56%	46%	40% - 54%	79%	51% - 95%
6	Singapore	2348	5	470	96 - 1157	40%	35% - 47%	28%	21% - 38%	52%	39% - 61%	60%	47% - 68%
7	Austria	2164	12	180	13 - 631	46%	38% - 63%	35%	28% - 53%	40%	29% - 73%	57%	46% - 84%
8	Russia	1565	10	157	77 - 239	57%	32% - 76%	47%	24% - 62%	64%	51% - 84%	79%	66% - 92%
9	Estonia	829	4	207	82 - 323	53%	41% - 65%	47%	34% - 59%	46%	41% - 63%	69%	46% - 100%
10	France	794	4	199	124 - 301	47%	31% - 58%	37%	22% - 45%	68%	48% - 76%	90%	76% - 97%
11	Chile	754	2	377	254 - 500	64%	57% - 68%	50%	39% - 56%	61%	48% - 68%	74%	55% - 83%
12	Finland	743	7	106	65 - 164	31%	21% - 37%	29%	21% - 37%	41%	36% - 52%	79%	71% - 88%
13	Portugal	679	4	170	113 - 239	41%	35% - 48%	34%	29% - 43%	60%	47% - 69%	74%	59% - 82%
14	Argentina	616	6	103	67 - 135	66%	62% - 71%	50%	33% - 63%	46%	27% - 55%	60%	33% - 77%
15	Mexico	508	1	508	-	76%	-	65%	-	66%	-	86%	-

16	China	397	2	199	94 - 303	41%	35% - 43%	32%	27% - 34%	50%	45% - 52%	56%	46% - 59%
17	South Africa	320	2	160	94 - 226	74%	71% - 82%	60%	56% - 71%	62%	53% - 84%	79%	75% - 89%
18	Romania	236	3	79	57 - 95	63%	61% - 64%	56%	53% - 57%	58%	54% - 67%	75%	64% - 82%
19	Japan	206	2	103	66 - 140	37%	35% - 39%	23%	21% - 24%	41%	20% - 51%	62%	20% - 82%
20	Liechtenstein	190	1	190	-	67%	-	54%	-	59%	-	65%	-
21	Greece	149	2	75	67 - 82	50%	49% - 52%	35%	33% - 37%	73%	70% - 76%	87%	76% - 96%
22	Luxembourg	111	1	111	-	54%	-	43%	-	56%	-	56%	-
23	United Kingdom	94	1	94	-	60%	-	56%	-	64%	-	64%	-
