

**Analysing and Promoting Entrepreneurship  
in Iranian Higher Education**

**Entrepreneurial Attitudes, Intentions and Opportunity Identification**

**Saeid Karimi**

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# **Analysing and Promoting Entrepreneurship in Iranian Higher Education**

**Entrepreneurial Attitudes, Intentions and Opportunity Identification**

**Saeid Karimi**

## **Thesis**

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# Chapter 1

## General Introduction

## 1.1 Introduction

This dissertation deals with the general topic of entrepreneurship because of its importance to productivity and economic growth, innovation, job creation, social development and poverty reduction (Audretsch, 2012; Fritsch, 2008; OECD, 2011; Shane & Venkataraman 2000; Parker, 2009; Peredo & Chrisman, 2006; van Praag & Versloot, 2007; Wennekers et al., 2005 ). Given these positive influences of entrepreneurship, considerable efforts have been made to promote entrepreneurship in both developing and developed countries. Scholars and policymakers are also increasingly interested in the factors which influence the decision to become an entrepreneur and understanding why some people start a business while others do not. Despite years of entrepreneurship research, however, we currently have only a limited understanding of the factors and underlying decision processes which motivate someone to become an entrepreneur (Markman, Balkin, & Baron, 2002). There is little agreement on the relevant factors, particularly in non-Western cultures and developing countries. Clarification of the most influential elements in shaping the individual decision to become an entrepreneur is thus called for.

Entrepreneurship education has been cited as one of the key elements for fostering the development of entrepreneurial attitudes and behaviour (Potter, 2008). In keeping with this, increased interest has been expressed by various stakeholders (e.g., public institutions, academic organizations) in the efficacy of entrepreneurship education programmes and thus their contribution to the individual decision to become an entrepreneur (Fayolle & Gailly, 2013). Nevertheless, the actual outcomes of entrepreneurship education have gone largely unexplored (Bechard & Gregoire, 2005; Fayolle, 2013; Peterman & Kennedy, 2003; Pittaway & Cope, 2007; von Graevenitz, Harhoff & Weber, 2010). Many questions about the effectiveness of entrepreneurship education programmes thus remain unanswered. Moreover, the results of the few available studies are inconsistent (Weber, 2012). Some studies report a positive impact of entrepreneurship education courses and programmes (e.g., Fayolle, Gailly & Lassas-Clerc, 2006; Souitaris, Zerbinati & Al-Laham, 2007); others report a statistically insignificant or even negative impact (Oosterbeek, van Praag, & Ijsselstein, 2010; von Graevenitz et al., 2010). These contradictory results can be traced back to a lack of methodological rigour in most of the relevant studies (Fayolle, 2013; Fayolle et al., 2006; Hindle & Cuttling, 2002; Peterman & Kennedy, 2003). Some of the studies, for instance, are ex-post examinations that therefore do not assess the direct impact of entrepreneurship education (e.g., Kolvereid & Moen 1997; Noel, 2001). Many of the studies have small sample sizes (e.g., Fayolle et al., 2006). A lack of theoretical framework is another limitation found in some of the studies. In their review of the literature, Nabi and colleagues (2013) found that 25% of the relevant articles did not clearly refer to a specific



theoretical approach or were not theoretically grounded. In other words, the articles offer a review of the literature with regard to a specific topic or research question but do not adopt a specific theoretical framework in doing this. Not surprisingly, several researchers have called for more rigorous research to address the question of if and how entrepreneurship education influences entrepreneurial attitudes and behaviour (Donckels, 1991; Kantor, 1988; Krueger & Brazeal 1994; McMullan et al., 2001; Peterman & Kennedy, 2003). It is thus of both theoretical and practical importance that the impact of entrepreneurship education be carefully assessed.

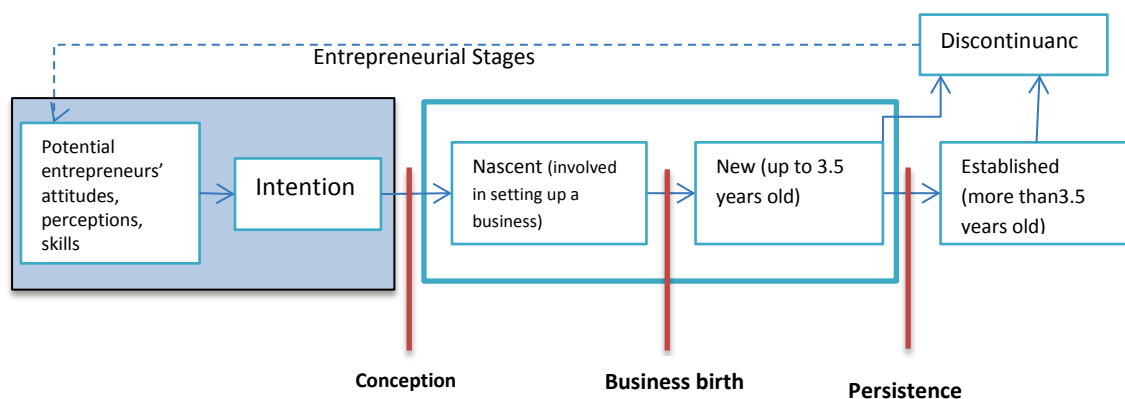
The present research helps to meet this need by carefully investigating the factors which influence the decisions of students in higher education to become entrepreneurs. This is done for a developing country, namely Iran, and draws upon an established theoretical framework to identify factors which can be expected to shape the individual's decision to start a business. In such a manner, the methodological deficiencies of prior studies are overcome; the contradictions found between the findings of prior studies can be resolved; and empirically-based suggestions for the design of effective educational initiatives can be put forth to promote entrepreneurship.

The results of five empirical studies are reported on here. The first study explored the application of the theory of planned behaviour within an Iranian context to see if the relationships hypothesized in this theory also hold there. The second and third study investigated which personal and situational variables relate to the formation of the individual intention to become an entrepreneur. The fourth study assessed the effects of entrepreneurship education programmes on the entrepreneurial intentions of higher education students in Iran. And in the final empirical study, efforts to foster a capacity for business opportunity identification are considered; such efforts have been largely ignored in previous studies of entrepreneurship education.

*Entrepreneurship* — or entrepreneurial behaviour — is defined as the process of identifying, evaluating and exploiting business opportunities with the aim of starting a company (Shane & Verkataraman, 2000). Shook, Priem and McGee (2003) have expanded the entrepreneurship process to include *entrepreneurial intention*, which may be seen as the first stage in a long, evolving process which can lead to entrepreneurial behaviour (Kolvereid 1996b; Krueger & Carsrud 1993; Linan & Chen, 2006; Shook et al., 2003). The Global Entrepreneurship Monitor (GEM: Kelley, Bosma, & Amorós, 2011) defines entrepreneurship as a more broad, continuous process which includes: potential entrepreneurs who intend to start a business in the future and are thus at the stage of entrepreneurial intention; nascent entrepreneurs who are involved in setting up a business; new entrepreneurs who have just started a business; and established entrepreneurs who own and manage an established business (Figure 1.1).

In this dissertation, we focus on an early stage in the entrepreneurial process, namely the stage of entrepreneurial intention, and those factors which influence how this stage unfolds (see

Figure 1.1). Entrepreneurial intention is a key element in understanding the process of starting a business (Bird, 1988). Intentions have been identified as the best predictors of planned behaviour, especially if the behaviour is “rare, hard to observe, or involves unpredictable time lags” (Krueger et al., 2000, 1991, p. 411) — which holds for entrepreneurial behaviour and thus entrepreneurial intentions. That is, entrepreneurship is a typical example of planned, intentional behaviour (Bird, 1988; Katz & Gartner, 1988; Krueger & Brazeal, 1994). In addition, at the level of the university, one of the main roles for entrepreneurship education programmes is to increase student awareness of entrepreneurship as a viable career option and thereby influence the entrepreneurial intentions of students.



**Figure 1.1** The entrepreneurial process (adapted from Reynolds et al., 2005)

## 1.2 Entrepreneurship in Iran

Over the past two decades, many developing countries — including Iran — have faced various economic problems and excessive numbers of university graduates unable to find work in particular (Karimi et al., 2010). Historically in Iran, the government has been the main employer of university graduates. The aim of higher education in Iran has therefore been to prepare students for government employment. In today's world of globalization, market liberalization, population growth and government downsizing, however, a shift has occurred in the employment market place towards the private business sector (Hosseini et al., 2008). And most researchers think that the failure of higher education today to meet the needs of the changing market place is the main reason for the continued high rates of unemployment among university graduates (Hosseini et al., 2008). International organizations like the Organization for Economic Cooperation & Development (OECD) and the World Bank but also national organizations like the National Organization of Youth and the Ministry of Cooperatives, Labor and Social Welfare have argued in the meantime

that “nurturing entrepreneurship” as a planned intervention in the social system but also in higher education can help governments foster economic development and increase employment (Karimi et al., 2010).

According to the GEM report in 2012 (Xavier et al., 2013), Iran ranks about “average” in terms of most entrepreneurship indices for the early stage in the entrepreneurial process (see Table 1.1). This report indicates that about 11% of the total population of working-age Iranians (18-64 years) is about to start an entrepreneurial endeavour or has recently started one (maximum of 3.5 years old). This places Iran 30<sup>th</sup> among the 67 current GEM countries. Entrepreneurs in Iran are perceived to be high status, and *young* entrepreneurs are responsible for most business start-ups in the country today. Around 60% of Iranians believe that being an entrepreneur is a desirable career choice. However, only 39% of Iranians think that there are good opportunities for starting a business within the next six months; this ranks Iran 35<sup>th</sup> among the 67 GEM countries according to this index. As can be seen from Table 1.1, Iran’s ranking on most indices at the level of the individual (e.g., perceived opportunities and entrepreneurial intentions) are almost equal to those of two other important developing — collectivist — countries, namely Turkey and China.

Based on the 2012 GEM report, starting a business in Iran is considered challenging largely because of governmental restrictions and a perceived lack of governmental support. Due to these restrictions and other negative economic conditions, the fear of failure rate for entrepreneurship in Iran in 2012 (40%) increased considerably compared to that in 2011 (25%) while entrepreneurial intention dropped to 23% in 2012 from 32% in 2011. Other studies also suggest that conditions in Iran are not conducive to entrepreneurship. According to a World Bank report (2012), Iran ranks 144<sup>th</sup> out of 183 countries with respect to the ease of doing business. Turkey ranks 123<sup>rd</sup> while China ranks 42<sup>nd</sup> on this index. In other words, the regulatory environment in Iran is less conducive to starting and operating a business than those in Turkey and particularly China.

**Table 1.1** Entrepreneurship Characteristics of Iran compared to China, Turkey and Other 67 GEM countries in 2012 (based on population aged 18-64 years)

Index	Iran (%)	Turkey (%)	China (%)	GEM (%)	Rank
<b>Perceived Opportunities</b>	39	40	32	42	35
<b>Perceived Capabilities</b>	54	49	38	51	26
<b>Entrepreneurial Intention</b>	23	15	20	27	35
<b>Fear of Failure Rate</b>	41	30	36	38	39
<b>Entrepreneurship as a Good Career Choice</b>	60	67	72	66	39
<b>High Status to Successful Entrepreneurs</b>	73	76	76	71	30
<b>Media Attention for Entrepreneurship</b>	61	57	80	60	28

### 1.3 Entrepreneurship Education in Iranian Higher Education

During the past decade, the Iranian government has developed an increased interest in entrepreneurship to provide a solution for the problem of unemployment and stimulate the economy. The government is spending more than ever to encourage entrepreneurship and promote innovation in the sectors of higher education, policy-making and business. Development measures and mechanisms have been proposed to foster entrepreneurship within both public and private sectors but also universities.

The first official step was taken in 2000 with the establishment of a comprehensive programme for entrepreneurship development at universities, called the KARAD, which constituted part of the Third Economic and Social Development Plan (2000-2005). The main goal of the KARAD was to promote an entrepreneurial spirit and culture within academic communities and familiarize students with entrepreneurship as a career choice. Specific aspects of the programme were aimed at encouraging and training students to develop a business plan, start a business and manage a business. To achieve the goals of the programme, several sub-programmes and strategies were considered including the establishment of centres for entrepreneurship and the introduction of entrepreneurship courses like the “Fundamentals of Entrepreneurship” into undergraduate education. The KARAD programme was implemented at 12 Iranian universities in 2003. The Fourth Development Plan (2005-2010) continued with the adopted strategy but aimed to give the development of entrepreneurship even more of a push via more intensive education, promotion and both direct and indirect support initiatives. As a result of this programme, entrepreneurship was elevated to a new level of importance within public policy (Karimi et al., 2010).

The stimulation of entrepreneurship in Iran has continued in the Fifth Development Plan (2010-2015). Considerable budgetary funds and effort have been devoted to the KARAD. Today, more than 110 centres for entrepreneurship exist within Iranian universities and 12 different institutes are now responsible for the promotion of KARAD objectives; these include the Ministry of Science, Research and Technology (MSRT) and the Ministry of Cooperatives, Labor and Social Welfare (Mahdavi Mazdeh et al., 2013).

Nonetheless, the lack of a comprehensive policy framework for entrepreneurial education as well as empirical research on the *effectiveness* of entrepreneurship education programmes is a significant impediment to improve the current entrepreneurship education programmes and thereby achieve both quicker and greater progress within the field of entrepreneurship (Karimi et al., 2010).

## 1.4 Theoretical framework

The approaches used to study entrepreneurial behaviour have changed over the years. Three main approaches can be distinguished for studying particularly the decision to become an entrepreneur: a personality traits approach, a socio-demographic approach and cognitive approaches. As might be expected, the three approaches reflect different views and perspectives on entrepreneurship.

### 1.4.1 The Trait Approach

The personality trait approach to the study of entrepreneurship is perhaps the most widely represented approach in the relevant research literature. The trait approach focuses on the personal dispositions of individuals and their accompanying personality traits (Nandram & Samsom, 2007). These can include the need for achievement, a propensity to take risks and locus of control (Brockhaus, 1980; McClelland, 1961). Within the trait approach to entrepreneurship, it is assumed that entrepreneurs will display certain similar traits which can then be used to distinguish them from the general population (Kirby, 2003).

Despite its great popularity, the trait approach to entrepreneurship has been criticized and this has led to considerable debate. Methodological and conceptual problems have been identified, but the trait approach has also been criticized for having little explanatory value (Ajzen, 1991; Gartner, 1989; Krueger, Reilly & Carsrud, 2000; Robinson et al., 1991; Santos & Liñán, 2007). As pointed out by Reynolds (1997), statistically significant relationships have been demonstrated between specific personality traits and being an entrepreneur, but the value of these personality traits for the *prediction* of entrepreneurship has been found to be quite limited.

Also with regard to entrepreneurship education, the trait approach has yielded poor results (Weber, 2012). In their prominent study, Oosterbeek et al. (2010) measured the impact of an entrepreneurship course on personality traits and found no significant differences in these traits after completion of the course. This finding is not surprising as personality traits are generally assumed to be extremely stable over time (Borghans et al., 2008; Caspi et al., 2005) and thus not susceptible to manipulation via short-term intervention. Chell (1986) has also pointed out that acceptance of a trait approach to entrepreneurship (or any other form of behaviour, for that matter) implies that people cannot be taught or learn to be an entrepreneur.

Despite its critics, the trait approach to entrepreneurship has contributed to our understanding of the phenomenon of entrepreneurship (Gartner, 1990). A number of scholars have therefore argued that the trait approach cannot simply be dismissed and that it still provides a number of avenues for exploration (Baum, Locke & Smith, 2001; Brandstätter, 2011; Rauch & Frese, 2007; Shane, Locke & Collins, 2003; Zhao, Seibert & Lumpkin, 2010). While the lack of a

clear theoretical framework has been one of the key criticisms of the trait approach to entrepreneurship (Gartner, 1989), a multidimensional model of venture growth was developed and tested by Baum, Locke and Smith (2001) who concluded that personality traits are important predictors of entrepreneurship but not when considered in isolation. The influence of personality traits on entrepreneurship must be analysed with an eye to such mediating factors as motivation and attitudes. Despite the low independent capacity of personality traits to predict entrepreneurial behaviour, that is, researchers hypothesize an indirect contribution of traits to specific entrepreneurial actions — including entrepreneurial intentions — via more immediate and thus direct influences on these such as attitudes and perceived self-efficacy (Fishbein & Ajzen, 2010) (see section 1.4.3 for further discussion of this). Other empirical studies also suggest that personality traits operate as more distal determinants of the individual's decision to become an entrepreneur (e.g., Zhao, Seibert & Hills, 2005).

#### **1.4.2 The Socio-demographic Approach**

Later studies of entrepreneurship have highlighted the importance of such socio-demographic characteristics as age, gender, family background, religious background, ethnic group membership, role models, level of education, employment experience and entrepreneurial experience (Dahlgvist et al., 2000; Reynolds et al., 1994; Storey, 1994; Unger et al., 2009). The socio-demographic approach is based on the assumption that people with similar backgrounds will have similar characteristics which can then be used to identify an entrepreneurial profile (Kanungo, 1998). In the socio-demographic approach, entrepreneurs are viewed as a product of the environment and thus factors largely beyond individual control.

The socio-demographic approach to the study of entrepreneurship, just as the trait approach, has been criticized for having major methodological and conceptual weaknesses (Gartner, 1989; Krueger et al., 2000; Reynolds, 1997; Robinson et al., 1991; Santos & Liñán, 2007; Veciana, Aponte & Urbano, 2005). Socio-demographic factors yield not only inconsistent and sometimes conflicting results but have also been found to be generally poor predictors of entrepreneurial behaviour; it is not possible to identify who is likely to become an entrepreneur on the basis of such factors (Gartner, 1989; Krueger et al., 2000). As Robinson et al. (1991) noted many years ago, entrepreneurship is far too complex to be predicted by socio-demographic factors alone. However, researchers have recently argued that socio-demographic factors, just as personality traits, can indirectly affect specific actions by influencing the *antecedents* to these actions (Fishbein & Ajzen, 2010).

In response to the criticisms of both the trait and socio-demographic approaches, researchers have turned to more cognitive models to better understand the complexity of

entrepreneurial behaviour (Bridge et al., 2009). The cognitive approaches to the study of entrepreneurship include the strengths of the trait and socio-demographic approaches with thus attention to *both* internal and external factors, but they also overcome many of the deficiencies of the former approaches at the same time.

### 1.4.3 Cognitive Approaches

Cognitive approaches entered the scene human behaviour by emphasizing that everything a human says or does is influenced by underlying perceptions, motives and attitudes (i.e., cognitive processes) (Krueger, 2003). Cognitive approaches to entrepreneurship moved beyond the trait and socio-demographic approaches by considering how entrepreneurs think and behave but also *why* they think and behave as they do (Delmar, 2000; Mitchell et al., 2007). In doing this, the cognitive approaches have also analysed the ways in which entrepreneurs perceive and process the information around them (Baron, 2004; Shane, 2007). It is thus assumed in most of the cognitive approaches to the study of entrepreneurship that decisions are made by entrepreneurs on the basis of *perceived* reality. Behaviour is largely based on how individuals perceive a situation and how a situation is presented to them (Delmar, 2000; Kirby, 2003). Researchers are confident about the predictive power of cognitive approaches to entrepreneurship, moreover, because the approaches take entrepreneurial behaviour to be a consequence of complex person-situation interactions (Gartner, 1985; Katz and Gartner, 1988). *Intentions* take centre stage as the cognitive state immediately prior to the performance of behaviour (Krueger, 2003). And intention is considered a robust predictor of planned behaviour in the form of starting a business (Ajzen, 1991; Bird, 1988; Krueger & Brazeal, 1994). In general, the stronger the intention, the more likely it is that the associated behaviour will be carried out in the future (Ajzen, 1991).

While the intention to carry out a given behaviour depends on a person's attitudes towards the behaviour, *attitudes* are largely shaped by exogenous factors (Ajzen, 1991; Bagozzi & Yi, 1989). The exogenous factors may include personality traits and socio-demographic factors (Ajzen, 1991). And intention-based theories therefore claim that exogenous factors influence individual attitudes and thereby indirectly intention and behaviour (Ajzen, 1987, see also Figure 1.2).

### 1.4.4 The Theory of Planned Behaviour

In recent entrepreneurship research, employment choice models with a focus on entrepreneurial intentions have been a topic of considerable interest (Kolvereid, 1996; Krueger & Carsrud, 1993; Linan & Chen, 2009; Souitaris Zerbinati & Al-Laham, 2007). One of the most widely researched of these models is that based on the theory of planned behaviour (TPB), as originally presented by

Ajzen (1988, 1991). In the TPB, it is assumed that human social behaviour is reasoned, controlled and planned in the sense that it takes into account the likely consequences of the behaviour being planned (Fishbein & Ajzen, 2010). Behavioural intention can thus be seen as an immediate antecedent to behaviour but is, itself, influenced by three key factors: attitudes toward the behaviour, subjective norms with regard to the behaviour and perceived behavioural control. These key motivational factors are shaped by such exogenous influences as personality traits, education and situational variables (Figure 1.2) (Ajzen, 1991; Borgia & Schoenfeld, 2005; Kolvereid, 1996; Krueger, 2003; Liñán, et. al., 2005; Souitaris et al., 2007). Ajzen (2012) has further argued that knowledge gathered using the TPB provides an excellent basis for interventions aimed at the modification of behaviour.

The TPB has been used to predict a wide range of human behaviours, including entrepreneurship (Fayolle et al., 2006). According to Fishbein and Ajzen (2010), moreover, the theory has utility for the prediction of behavioural intentions in both western and non-western cultural contexts. In keeping with this, the TPB has been used with success to investigate the entrepreneurial attitudes and intentions of students in different countries (Engle et al., 2010; van Gelderen et al., 2008; Lakovleva et al., 2011; Moriano et al., 2011). The theory has also been applied with success to evaluate entrepreneurship education efforts (Fayolle & Gailly, 2013; Fayolle et al., 2006; Souitaris et al., 2007). If the main aim of entrepreneurship education is to positively influence the entrepreneurial attitudes and intentions of students, then the TPB provides a sound conceptual and methodological framework for assessing this. The TPB is concentrated on a few core variables, which can be assumed to be sufficient for understanding and modifying both entrepreneurial intentions and behaviour. That is, a change in one, two or all of the motivational precursors to intention can be expected to elicit a change in entrepreneurial intention and behaviour in the end. This simple but efficient mechanism provides important information for the design of effective entrepreneurship education efforts and the evaluation of these (Weber, 2012). Stated differently, the TPB provides a relevant framework for determining how entrepreneurship education and other variables influence the entrepreneurial attitudes and intentions of students.

For the case of entrepreneurship, the constructs from the TPB are defined as follows:

- *Entrepreneurial intention* refers to the intention of an individual to start a new business. In other words, entrepreneurial intention is 'a 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' (Thompson, 2009, p. 676).

- *Attitudes toward Entrepreneurship* refer to the degree to which a person has a favourable or unfavourable evaluation or appraisal of becoming an entrepreneur or its consequences. Attitudes

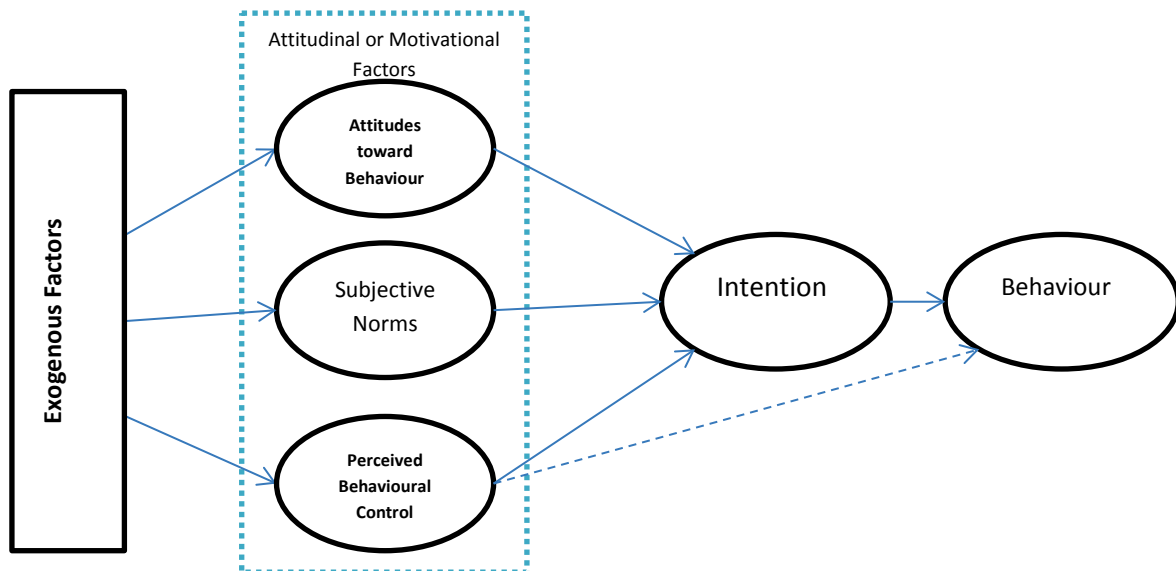


toward entrepreneurship include not only affective (e.g., *I like the idea, I find the idea attractive*) but also evaluative considerations (e.g., *it has advantages*) (Linan & Chen, 2009). If someone expects the outcome of becoming an entrepreneur to better his or her position, that person is more likely to become an entrepreneur.

- *Subjective Norms* refer to the perceived social pressure from family, friends or significant others to start a business or not (Krueger et al., 2000).

- *Perceived Behavioural Control* refers to the perceived difficulty or ease of becoming an entrepreneur. Perceived behavioural control is very similar to Bandura's notion of perceived self-efficacy (1977, 1997) and to perceived feasibility (Shapero & Sokol, 1982). For all three concepts in the case of entrepreneurship, the important aspect is a sense of capacity for the fulfilment of business creation intentions and behaviour (Linan, Rodríguez-Cohard, & Rueda-Cantuche, 2011).

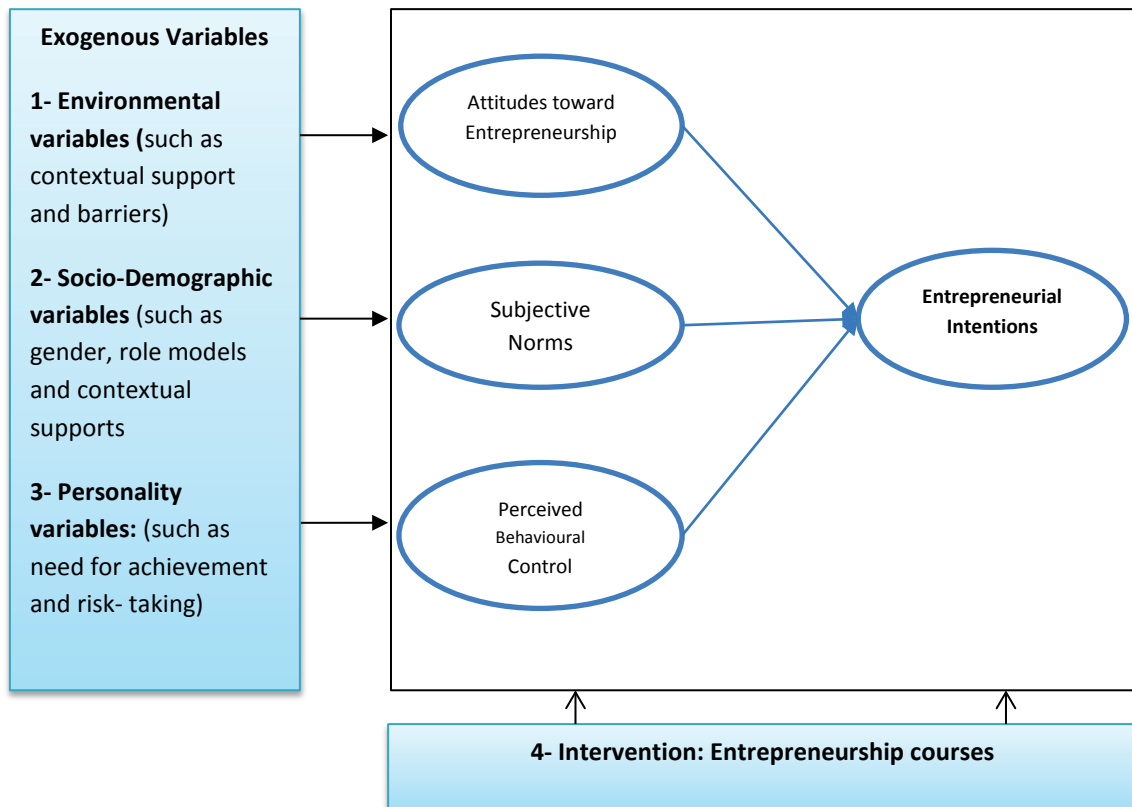
The TPB predicts that the more favourable the attitudes and subjective norms with respect to a behaviour — in combination with a high level of perceived behavioural control, the greater the intention to perform the behaviour will be. According to the TPB, moreover, exogenous variables such as demographic and personality factors may *indirectly* influence intentions and behaviour in two ways (Fishbein, 1980; Fishbein & Ajzen, 2010). First, exogenous variables can influence the intentions and behaviour of an individual via their effects on the individual's attitudes toward the behaviour, subjective norms and perceived behavioural control of the individual. The exogenous or external variables thus have a mediated effect on intentions and behaviour. Second, exogenous or external variables can affect the relative importance of attitudes toward behaviour, subjective norms and perceived behavioural control. Exogenous variables thus have a moderating effect on the relationships between intentions and behaviour and their antecedents. A variety of exogenous variables including socio-demographic and personality factors can thus be incorporated into the TPB to investigate the mediated and moderating effects of these variables for entrepreneurial intentions and behaviour (Figure, 1.2).



**Figure 1.2** The Theory of Planned Behaviour (according to Ajzen, 1991)

### 1.5 Conceptual Framework for the Project

In Figure 1.3, two groups of possible determinants of students' entrepreneurial intentions are distinguished: the three motivational antecedents to entrepreneurial intention as identified in the TPB (Ajzen, 1991) and the exogenous influences of environmental, socio-demographic and personality variables in addition to entrepreneurship education. This integrated model of entrepreneurial intention provides the theoretical foundation for this dissertation. Little research has been conducted on the influences of these two groups of factors on students' entrepreneurial intentions within a cognitive model of entrepreneurial intention, particularly for a developing country like Iran. The relationships between the factors were therefore investigated within the context of Iranian higher education. Drawing upon the TPB, the efficacy of entrepreneurship education was also assessed while doing this. Entrepreneurship education can be assumed to positively influence the components of the TPB and thereby the entrepreneurial intentions of students.



**Figure1.3** Conceptual Framework of the Project

## 1.6 Problem statement and research questions

Given the scarcity of research regarding entrepreneurship and entrepreneurship education in Iran, little information was available on how the exogenous variables included in the conceptual framework could be expected to influence the motivational antecedents to entrepreneurial intentions and the entrepreneurial intentions of students in higher education. Greater insight is nevertheless needed to develop, implement and evaluate entrepreneurship education programmes. And the aims of the present research were therefore fourfold.

First, we wanted to study the application of the TPB within an Iranian context. Second, we wanted to explore the determinants of entrepreneurial attitudes and intentions in order to provide suggestions for the design of effective entrepreneurship education initiatives. Third, we wanted to assess the effects of entrepreneurship education on the entrepreneurial attitudes and intentions of students in higher Iranian education. And fourth, we wanted to assess the effects of a redesigned entrepreneurship course on students' ability to identify business opportunities. To achieve these aims, the following research questions were addressed.

### 1.6.1 The influence of cultural values on entrepreneurial intentions

Up until now, few attempts have been made to investigate entrepreneurial intentions, attitudes, and motivations of students in developing countries (Nabi & Linan, 2011). In particular, there is limited available research on the application of the TPB to non-western cultures including more collectivist cultures like that of Iran. In addition to knowing very little about entrepreneurial attitudes and intentions for developing and/or non-western countries, we also know very little about the contributions of cultural values at the level of the individual to the motivational antecedents of intentions and entrepreneurial intentions. For this reason, scholars have called for the study of how cultural values influence entrepreneurial motivations and intentions both in general and in non-western cultures in particular (Lakovleva et al., 2011; Liñan & Chen, 2009; Thornton et al., 2011; Siu & Lo, 2011; Shinnar, Giacomini & Janssen, 2013).

To examine the applicability of the TPB in a non-western country with a more collectivist than individualist culture in addition to the role of various antecedents to behavioural intentions and the influence of cultural values on the antecedents to intention and entrepreneurial intentions, we formulated the following research questions.

**RQ1a:** *Are students' entrepreneurial intentions positively influenced by attitudes toward entrepreneurship, subjective norms and perceived behavioural control in an Iranian context?*

**RQ1b:** *To what extent do cultural values influence students' entrepreneurial intentions via the components of the TPB?*

**RQ1c:** *To what extent do cultural values influence the strength of the relationships within the TPB?*

These questions were answered by applying the TPB within an Iranian context and determining the mediated and moderating effects of two important cultural values — namely, individualism and collectivism — on the relationships between the antecedents to entrepreneurial intentions and the entrepreneurial intentions of higher education students.

The answers to these questions were expected to help us gain insight into the TPB and how cultural values influence motivational factors and entrepreneurial intentions. The answers were also expected to show us whether the TPB operates the same in different cultural contexts or not. And, finally, the answers to these questions were expected to give us a more thorough understanding of entrepreneurial intentions and thus help policymakers and educators develop strategies to stimulate entrepreneurship. The study undertaken to answer these questions is presented in Chapter 2.

### 1.6.2 The Influence of gender and role models on entrepreneurial intentions

The presence of entrepreneurial role models is amongst the most important socio-demographic factors influencing entrepreneurship (European Commission, 2003; Fornahl, 2003; OECD, 2009).

Drawing upon theories of social learning and role identification, Gibson (2004, p.149) argues that role models serve three interrelated functions: 'to provide learning, to provide motivation and inspiration and to help individuals define their self-concept'. Nauta and Kokaly (2001) attribute an additional function to role models, namely the provision of guidance and support. Entrepreneurial role models can therefore be seen as a source of entrepreneurial inspiration, entrepreneurship learning, entrepreneurial guidance and entrepreneurial support (Bosma et al., 2012). Despite agreement on the importance of role models, widespread debate exists with regard to the exact mechanisms and the magnitude of their influence on the entrepreneurial intentions of students — particularly in developing countries.

Gender is a socio-demographic factor which has been shown to influence entrepreneurship. Women's entrepreneurship is significantly lower than men's (Langowitz & Minniti, 2007), and this gap is very wide in Iran. The reasons for the gap are not clearly understood (Minniti & Arenius, 2003). One factor may be differences in the entrepreneurial perceptions and intentions of men versus women (Koellinger et al., 2011). Most of the research on female entrepreneurship has been conducted in Western countries such as the USA and the UK (Ahl, 2002), however, which means that very little is known about the relevant factors and their influences elsewhere. Including gender as a potential moderator of the relationships between the antecedents to entrepreneurial intention and entrepreneurial intentions can thus help us gain insight into the gender differences observed for entrepreneurship. And this increased insight can presumably help create more favourable environments for females to participate in entrepreneurial education efforts and entrepreneurial activities.

With regard to the influences of gender and role models, researchers have argued that such socio-demographic variables may only affect entrepreneurial intention indirectly via its antecedents (Fishbein & Ajzen, 2010). For this reason, the following research questions were formulated for the second study in the present research.

**RQ2a:** *To what extent do entrepreneurial role models influence students' entrepreneurial intentions via the components of the TPB?*

**RQ2b:** *To what extent does gender moderate the relationships between role models and the components of the TPB as well as the relationships among the TPB components themselves?*

To answer these research questions, we added the variable *entrepreneurial role models* to the TPB model and incorporated *gender* into the model as a possible moderator of the relationships between entrepreneurial role models and the components of the TPB, on the one hand, and the relationships between the components of the TPB, on the other hand. The study undertaken to answer these questions is presented in Chapter 3.

### 1.6.3 The influence of personality characteristics and contextual factors on entrepreneurial intentions

As already noted, major methodological and conceptual weaknesses in the trait approach to the study of entrepreneurship have been pointed out (Gartner, 1989; Krueger et al., 2000; Linan et al., 2011; Reynolds, 1997; Robinson et al., 1991). In particular, the trait approach has been criticized for having limited predictive value (Reynolds, 1997). Nevertheless, a significant role for personality traits as more distal as opposed to proximal determinants of entrepreneurship cannot be ruled out as yet (Linan et al., 2011; Mazzarol et al., 1999; Rauch & Frese, 2007; Wagner & Sternberg, 2004). When Baum, Locke and Smith (2001) developed and tested a multidimensional model of entrepreneurship, for instance, their conclusion was that personality traits are important predictors of entrepreneurship but not directly and not in isolation; their effects are mediated by such factors as motivation and strategy. In other words, personality factors may influence initial entrepreneurial perceptions and only thereby final entrepreneurial outcomes (Ajzen & Fishbein, 1980; Simon & Houghton, 2002).

Individuals are also surrounded by a range of contextual factors which can push and pull them in various directions (Hisrich, 1990). Entrepreneurial intentions can thus be expected to be based on a combination of personal and contextual variables (Boyd & Vozikis, 1994). To date, however, social-cognitive models of entrepreneurship including the TPB have not integrated personality characteristics — such as the need for achievement — with contextual factors — such as perceived contextual support (Burmúdez, 1999). Investigations of the components of the TPB as mediators of the influences of personality and contextual variables on entrepreneurial intentions and behaviour are rare. As far as we know, no attempts have been previously made to incorporate personality and contextual variables into the TPB in order to assess the effects of these variables on the motivational antecedents of entrepreneurial intentions and the entrepreneurial intentions of students. The third study and question in the present research thus concerns the roles of personality characteristics and contextual factors within a cognitive model that draws upon the TPB in order to understand entrepreneurial attitudes and intentions.

**RQ3:** *To what extent do personality characteristics and contextual factors influence students' entrepreneurial intentions via the components of the TPB?*

It was expected that the answer to this question would provide further insight into how personality and contextual variables influence entrepreneurship. This insight can help both entrepreneurship educators and policymakers develop effective strategies for fostering positive entrepreneurial attitudes and intentions among students of higher education. The study is presented in Chapter 4.

#### 1.6.4 Effects of entrepreneurship education on entrepreneurial intentions

Over the past decade, a dramatic rise in the number and status of entrepreneurship education programmes at colleges and universities has occurred worldwide (Fayolle, 2013; Kuratko, 2005; Neck & Greene, 2011). Little research has been conducted on the effectiveness of these programmes, however, especially in developing countries like Iran. As Fayolle and Gailly (2013) have noted, there is a marked lack of research on the outcomes of entrepreneurship education. Similarly, von Graevenitz et al. (2010) have stated that very little is known about the effects of entrepreneurship courses.

The results of the few existing studies are ambiguous or inconsistent at best (Weber, 2012). Methodological limitations and theoretical shortcomings may account for some of the inconsistencies found for the effects of entrepreneurship education (Fayolle, 2013; von Graevenitz, et al., 2010). In previous studies, for example, elective versus compulsory programmes were not distinguished. Voluntary versus compulsory participation in entrepreneurship courses can nevertheless be expected to influence the outcomes of such courses but we do not know just how. For this reason, Oosterbeek et al. (2010) has called for the testing of different programme variants, and the present research aimed to do this.

In the fourth study reported on here, it was attempted to reduce the theoretical and methodological gaps which characterize our knowledge of the effectiveness of entrepreneurship education. At the level of the university, the main aim of entrepreneurship education is to positively influence the entrepreneurial attitudes and intentions of students (Fayolle & Gailly, 2013). The TPB provides a sound conceptual and methodological framework for assessing efforts to do this (Fayolle & Gailly, 2013; Souitaris et al., 2007). The framework provided by the TPB also allows us to compare different courses and draw implications to maximize the outcomes (Weber, 2012).

The fourth study reported on here addressed the following research question.

**RQ4:** *Do current entrepreneurship education programmes at Iranian universities positively affect the entrepreneurial attitudes and intentions of students?*

This study drew upon the TPB to assess the effects of large-scale compulsory but also elective entrepreneurship courses on the entrepreneurial attitudes and intentions of students. According to a model which draws upon the TPB, effective educational programmes should increase the values of the antecedents to entrepreneurial intentions (i.e., attitudes towards entrepreneurship, subjective norms and perceived behavioural control). This was therefore studied and the answer to the research question could be expected to provide additional insight into the TPB but also its implications for the design and implementation of entrepreneurship education programmes. That is, by answering the question of whether behavioural interventions

can play a significant role in the formation of attitudes but also entrepreneurial intentions, we can presumably improve the design of entrepreneurship education programmes and thus enhance their effectiveness. This study is presented in Chapter 5.

### **1.6.5 Fostering opportunity identification competence**

In addition to entrepreneurial intentions, another crucial component in the early stages of the entrepreneurial process is so-called opportunity identification (Ardichvilia, Cardozob & Ray, 2003; Gaglio & Katz, 2001; Shane & Venkataraman, 2000). One of the main outcomes of entrepreneurship education should therefore be enhancement of this capability (Linan et al., 2011; Muñoz et al., 2011). Entrepreneurship education should equip students with the knowledge and skills needed to find and create business opportunities (Neck & Greene, 2011; Sarasvathy, 2008). However, the majority of entrepreneurship education programmes focus on the exploitation of existing opportunities and thus assume that the opportunity has already been identified (Neck & Greene, 2011). Little attention is paid to the identification or generation of business opportunities and the skills needed to do this within existing entrepreneurship education programmes.

Both researchers and educators struggle with how business opportunity identification can best be fostered (Neck & Greene, 2011; Saks & Gaglio, 2002). There are calls for more research on classroom efforts to foster this ability (e.g., Saks & Gaglio, 2002; Rae, 2003).

The purpose of the fifth and final study in the present research was therefore to help fill the gap in current entrepreneurship education and provide insight into how opportunity identification competency can be fostered in a university classroom setting. In order to do this, the study drew upon suggestions by Carrier (2007, 2008), DeTienne and Chandler (2004) and Gundry and Kickul (1996) — namely that entrepreneurship education should focus on the promotion of creativity, divergent thinking and idea generation in order to foster an ability to identify business opportunities. This led to the fifth research question in the present research, which was as follows.

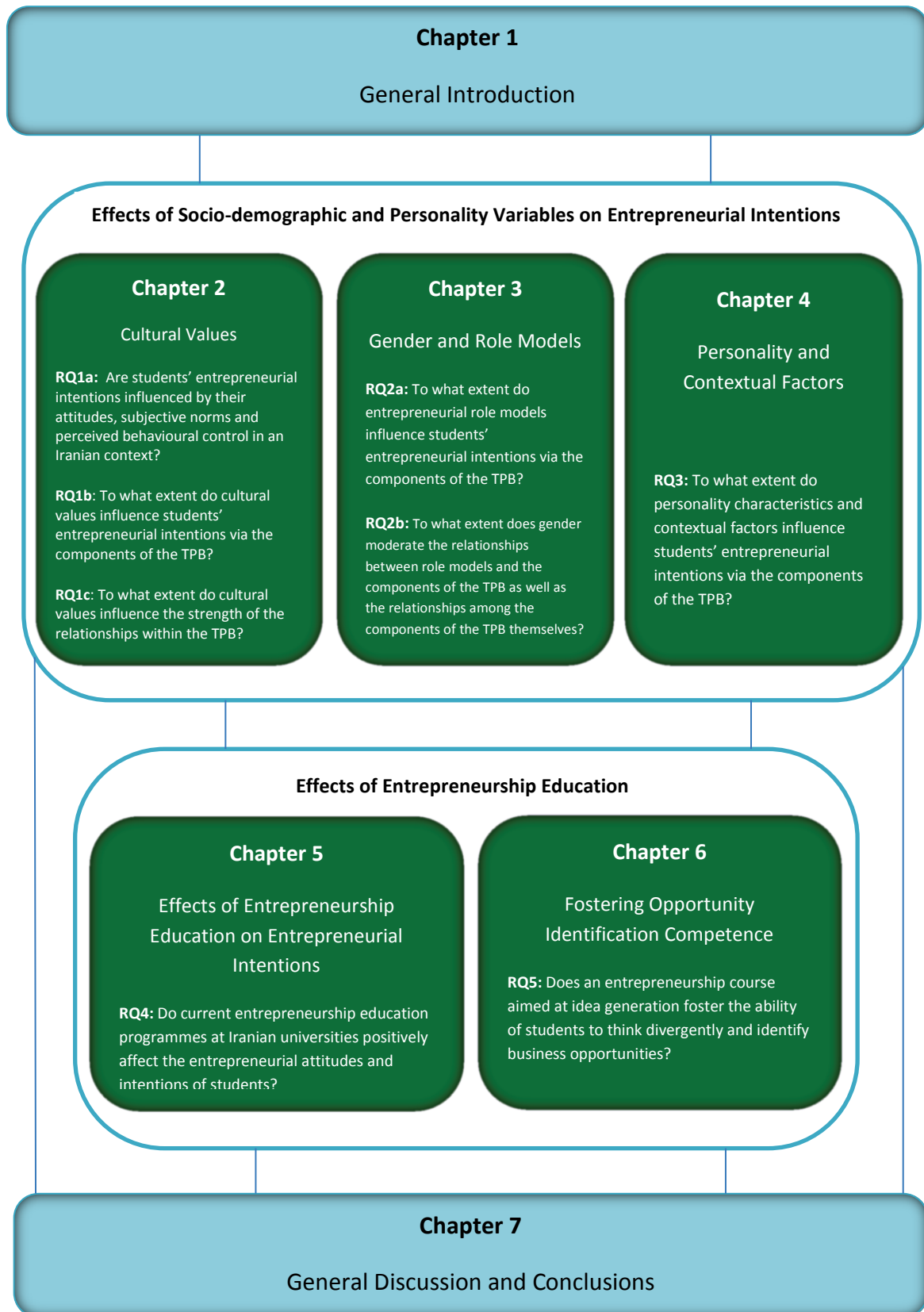
**RQ5:** *Does an entrepreneurship course aimed at idea generation foster the ability of students to think divergently and identify business opportunities?*

In order to answer this research question, training on idea generation was incorporated into an existing entrepreneurship education course. The effects of the redesigned course on the divergent thinking of students and their ability to generate business opportunities could then be assessed. The findings of this study can be expected to help policymakers, universities, educators and others with an interest in enhancing entrepreneurial skills and promoting business opportunity identification. The results of the study are presented in Chapter 6.



## 1.7 Overview of the thesis

Figure 1.4 provides a schematic overview of the chapters in this dissertation and how the five studies reported in Chapters 2, 3, 4, 5 and 6 come together. The five empirical chapters can be read independent of each other and have been either submitted as articles or already published in international peer-reviewed journals. In Chapter 7, the main findings from the five empirical studies are summarized and discussed together with their theoretical and practical implications. Some possible limitations on the reported research are pointed out. And, to close, a number of recommendations for future research are presented.



**Figure 1.4** Outline of thesis in relation to research questions

## Chapter 2

### The Influence of Cultural Values on Entrepreneurial Intentions

## Abstract

While the influence of culture on entrepreneurship is widely acknowledged, little empirical research has been conducted on the role of culture at the level of the individual. In the present study, we therefore examined how the cultural value orientations of 255 final year undergraduate students from seven public Iranian universities influenced their entrepreneurial motivations and intentions. We incorporated the cultural values of collectivism and individualism into a model of entrepreneurial intention which draws upon the theory of planned behaviour (TPB), cognitive hierarchy theory, Bontempo and Rivero's theory and self-construal theory. Structural Equation Modelling showed collectivism to positively influence the entrepreneurial intentions of the students through their subjective norms and individualism to positively influence the entrepreneurial intentions of the students through their attitudes toward entrepreneurship and perceived behavioural control. We also found individualism to moderate the relationship between attitudes toward entrepreneurship and entrepreneurial intentions, such that the positive relationship was stronger when individualism was high as opposed to low. The TPB was thus shown to work somewhat differently within the Iranian collectivistic context depending on the students' cultural value orientations. The knowledge gained in this study provides a more thorough understanding of the role of cultural values and motivational perceptions in explaining entrepreneurial intentions and can help both policymakers and educators develop effective strategies for promoting entrepreneurship.

## 2.1 Introduction

The entrepreneurship literature shows intentions to play a crucial role in the decision to start a new business (Kruger et al., 2000; Kolvereid & Isakson 2006; Liñan & Chen, 2009). However, less is known about the factors which influence entrepreneurial intentions. We know very little, for example, about the attitudes, motivational factors and other antecedents connected to entrepreneurial intentions (EI) and behaviour, and this particularly the case for non-Western cultures and developing countries (Nabi & Liñán, 2011). The data on EI is largely skewed toward the USA and other Western countries, which all share cultures which are more individualist than collectivist (Lee et al., 2006). There is thus little empirical evidence to date on EI and its antecedents from cultures and countries which are relatively more collectivist than individualist.

Iran is one such collectivist country (Hofstede, 1983; House et al., 2004) where different cultural values may contribute to EI and its antecedents. Iran is a country with a rich and ancient cultural heritage but also strategic and economic importance within the Persian Gulf and West Asia (Yeganeh & Su, 2007). Attention to entrepreneurial perceptions and intentions in Iran is thus merited but lacking. And for this reason, the theoretical framework provided by the theory of planned behaviour (TPB; Ajzen, 1991) was adopted to investigate whether the antecedents of EI

as identified in a model based on the TPB influence students' EI within the context of a non-Western, developing country.

In addition to knowing very little about EI and its antecedents in developing and/or non-Western countries, we know very little about the contributions of individual-level cultural values to the antecedents of EI in general and within non-Western contexts in particular.

Cultural values are known to shape attitudes and behaviours in general (Homer & Kahle, 1988; Gregory et al., 2002; Schwartz, 2006; Hofstede, 2001). Cultural values are also thought to influence entrepreneurial cognition (e.g., perceptions, attitudes, decision-making) and behaviours (Forbes, 1999; Mitchell et al., 2000; Mitchell et al., 2002; Liñán, Santos & Fernández, 2011; Thornton, Ribeiro-Soriano & Urbano, 2011). However, at the level of the individual, little is known about the effects of cultural values. In particular, there are only limited empirical tests of cultural values in entrepreneurial intention models (Linan, Nabi & Krueger, 2013). The exact mechanisms via which cultural values affect EI are thus not well understood. For this reason, scholars have called for the study of how cultural values influence entrepreneurial perceptions and intentions (Liñan & Chen, 2009; Iakovleva, Kolvereid & Stephan, 2011; Thornton et al., 2011; Siu & Lo, 2011; Shinnar, Giacomin, & Janssen, 2013).

Based on the theory of planned behaviour (Ajzen, 1991), cognitive hierarchy theory (Homer & Kahle, 1988), Bontempo and Rivero's theory (1992), self-construal theory (Markus & Kitayama, 1991) and the literature on cultural orientations, we developed a model of entrepreneurial intentions and investigated the influences of individual-level cultural values and motivational factors on EI within an Iranian context. Specifically, the study proposed a theoretical framework in which cultural values are expected to act as distal determinates of EI and also moderate the relationships between EI and its motivational antecedents. Such an extended model of entrepreneurial intention has received little attention in previous research.

Testing this integrated model in a developing country can provide insight into the TPB and the relationships between cultural values, motivational perceptions and EI. The results can, in turn, help policy makers and educators develop interventions to stimulate EI. This study can methodologically advance the study of the influence of cultural values on entrepreneurial cognition. With the measure of cultural values at the level of the individual, we can gain insight into the specific effects of the values on EI and the antecedents of EI at the level of the individual.

The next section presents the theoretical framework and hypotheses to be tested. This is followed by the research methods and results in which the study characteristics and outcomes are presented. The discussion section comments on these results. Finally, some implications for educators and policy makers, some possible limitations on the study and some directions for future research are presented.

## 2.2 Theoretical Framework and Hypotheses

### 2.2.1 The Theory of Planned Behaviour

Early research on those factors which influence the decision to start a business and thus become an entrepreneur focused on personality traits and such psychological characteristics as a need for achievement and risk-taking propensity (McClelland, 1961; Brockhaus, 1980). Later studies highlighted the importance of such demographic characteristics as age, gender, religious background, ethnic group membership, level of education and employment experience (Reynolds et al. 1994; Storey, 1994; Dahlvist et al., 2000). Both the early trait and later demographic approaches to the study of entrepreneurship were criticized for having limited predictive value and thus explanatory capacity but also major methodological and conceptual weaknesses (Gartner, 1989; Robinson et al., 1991; Krueger et al., 2000). Social psychological and cognitive approaches then entered the scene with an emphasis on the influences of underlying perceptions, motivation and attitudes (i.e., cognitive processes) on human action (Krueger, 2003). Intentions take centre stage in cognitive models of behaviour because intention is the cognitive state immediately prior to the performance of behaviour (Krueger 2003) and also considered to be the single best predictor of behaviour (Ajzen, 1991; Sutton, 1998). Intentions themselves may be influenced by several factors such as personal needs, values, wants, habits and beliefs (Bird, 1988; Lee & Wong, 2004). And for understanding entrepreneurship, many researchers have similarly asserted that attention to cognition structures and entrepreneurial intentions is crucial (Busenitz & Barney, 1997; Mitchell et al., 2002; Baron, 2004; Krueger, 2007).

One of the most widely researched cognitive models is the Theory of Planned Behaviour (TPB) as originally put forth by Ajzen (1988, 1991). In this model, Ajzen assumed that human behaviour is reasoned, controlled and planned in the sense that it takes the likely consequences of a behaviour which is being considered into account. The core factor in the TPB is thus the individual *intention* to perform a given behaviour. Intention is assumed to be best predicted by attitudes (i.e., attitudes toward the behaviour, subjective norms and perceived behavioural control). The more favourable the attitudes toward a planned behaviour and the subjective norms with regard to the behaviour together with strong perceived behavioural control, the greater the intention to perform the behaviour in question.

Researchers have empirically applied the TPB to predict the EI of college students and confirmed the theory's predictive validity when using three motivational antecedents (e.g., Krueger et al., 2000; Autio et al., 2001; Liñán & Chen, 2009; Engle et al., 2010; Iakovleva et al., 2011; Moriano et al., 2012; Karimi et al., 2013). The outcomes of the aforementioned studies nevertheless show marked variation across situations and countries in the relative importance of

the antecedents and the magnitude of their influences. Clear and significant effects of attitudes toward entrepreneurship (ATE) and perceived behavioural control (PBC) on the EI of students have been documented for a variety of countries (e.g., Engle et al., 2010; Iakovleva et al., 2011; Moriano et al., 2012), including Iran (Karimi et al., 2013). The effects of subjective norms (SN) on the EI of students are less clear cut, however: Most studies show only small or non-significant direct prediction of EI. In research by Moriano et al. (2012), for example, SN significantly related to EI in only two out of six countries and only predicted EI marginally in Iran. In keeping with these findings, Liñán and Santos (2007) have suggested that SN is a specific form of social capital and may thus play a role in the other antecedents of intention, namely ATE and PBC. In fact, Ajzen (1991) has suggested that the three antecedents of TPB may not always play a role in the prediction of intentions. And in a number of recent studies of entrepreneurship from a social-capital perspective, SN indeed affected ATE and PBC positively and thereby EI *indirectly* (Liñán & Santos, 2007, Liñán & Chen, 2009, Liñán, 2008; Liñán, Urbano, & Guerrero, 2011; Paço et al., 2011).

Drawing upon not only the recent work of Liñán and his colleagues (Liñán & Chen, 2009; Liñán et al., 2011) but also others concerned with the prediction of the EI, we formulated the following hypotheses:

**H1:** *Attitudes toward entrepreneurship positively influences entrepreneurial intentions.*

**H2:** *Perceived behavioural control positively influences entrepreneurial intentions.*

**H3:** *Subjective norms positively influence entrepreneurial intentions.*

**H4:** *Subjective norms positively influence attitudes toward entrepreneurship.*

**H5:** *Subjective norms positively influence perceived behavioural control.*

### **2.2.2 Cultural Values**

Culture plays a key role in defining the social context within which individuals act (Srite & Karahanna, 2006). Culture can be defined as the underlying system of values peculiar to a specific group or society. Thus culture can motivate individuals within a society to engage in behaviours which may not be as prevalent in other societies (Mueller & Thomas, 2001).

While the significance of cultural values and norms for the individual decision-making and cognitive processes involved in entrepreneurship is recognized (e.g., Adler et al., 1986; Bird, 1988; Busenitz, 1996; Davidsson, 1995; Hayton, George, & Zahra, 2002; Mitchell et al., 2000; Tiessen, 1997; Vernon-Wortzel & Wortzel, 1997), little *empirical* attention has been paid to cultural values and norms in research on entrepreneurship. In fact, many studies simply ignore cultural variables (Fayolle et al., 2010). And in the few empirical studies which have analysed cultural values in relation to entrepreneurship, the results have been ambiguous or inconsistent. Some studies have

concluded that entrepreneurship is positively related to cultural values, while other studies have found the opposite pattern (Hayton, George, & Zahra 2002, for a review; Bowen & DeClercq, 2008; Hofstede et al., 2004; Mueller & Thomas, 2001; Pinillos & Reyes, 2011; Wennekers et al., 2007). The mechanisms underlying the influence of culture on entrepreneurship are little understood.

Recent empirical findings suggest similarly that cultural values may influence the relationships between the components of the TPB (Liñán & Chen, 2009; Moriano et al, 2012). This conclusion cannot be firmly drawn, however, as the studies are also based on Hofstede's dimensions of national cultures (1980, 1991, 2003). In most of these studies, the country is considered as a whole and thus any individual, within-group differences in cultural values are ignored or glossed over. The individual members of a society can obviously vary in the degree to which they identify with, adhere to and act in accordance with specific cultural values and norms (Cross & Madson, 1997; McCoy, 2005; Cleveland & Laroche, 2007). People in a collectivist society may sometimes function more as individualists than as collectivists while, conversely, people in an individualist society may sometimes function more as collectivists than as individualists (Triandis, 1995). It is thus inappropriate to use measures of culture obtained at the level of the country to predict behaviour at the level of the individual (Ford, Connelly & Meister, 2003; McCoy et al., 2005, 2007; Straub et al., 2002). Changing social, economic and political circumstances can also influence cultural values over time (Xie et al., 2006). All of this has led researchers to argue that cultural values should be measured at the level of the individual and for the incorporation into investigations of attitudes, perceptions and behaviour within the domain of entrepreneurship (Schaffer & Riordan, 2003; Shinnar et al., 2013).

In sum, very few studies to date have investigated the influence of cultural values at the level of the individual on EI and its antecedents as articulated in the TPB. In the present study, we thus set out to fill this gap and focused on two the most prominent cultural values, namely individualism and collectivism to do this. The cultural values of individualism and collectivism have been frequently used in research on entrepreneurship (e.g., Mitchell et al., 2000; Mueller & Thomas, 2001; Liñán & Chen, 2009). They are arguably among the most important aspects of culture and thus among the main dimensions along which cultures can vary from each other (Franke et al., 1991; Vandello & Cohen, 1999; Triandis, 2001; Schimmack et al., 2005; Triandis, 1995; Hofstede, 2001; Oyserman & Lee, 2008). And the inclusion of these values in our research can thus contribute to the theory of planned behaviour itself and to our understanding of entrepreneurship as well.

Individualism and collectivism were initially conceptualized as the opposite poles of a single dimension of culture (e.g., Hofstede, 1980), but more recent studies have indicated that



individualism and collectivism are better understood as separate dimensions along which cultures can vary from each other and thus as coexisting dimensions of culture (Triandis, 1994; Freeman, 1996; Gelfand et al., 1996; Triandis & Gelfand, 1998; Oyserman et al., 2002). At the level of the individual, empirical studies also suggest that individualism and collectivism constitute separate attributes (e.g., Ho & Chiu, 1994; van Hooft & Jong, 2009). That is, a person can have both individualist and collectivist characteristics and tendencies (Sinha and Tripathi, 1994; Triandis, 1989, 1994). Different situations may, in turn, elicit more individualist or collectivist manifestations of the self (Trafimow, Triandis, & Goto, 1991). The person may strongly believe in personal initiative and independence, for example, but also highly value group harmony and sharing (Trafimow et al., 1991). Individualism and collectivism must thus be assessed as separate characteristics of the individual and not opposites along a single continuum.

According to the TPB, exogenous variables (such as personality traits and cultural values) can influence intentions and behaviour in two ways (Fishbein, 1980; van Hooft & Jong, 2009). Firstly, exogenous or external variables can indirectly influence the intentions and behaviour of individuals via their effects on the attitudes of individuals (i.e., ATE, SN and PBC). That is, exogenous or external variables can have mediated effects. Secondly, exogenous or external variables can affect the relative weights that individuals place on attitudes (i.e., ATE, SN and PBC) as determinants of their intentions (i.e., have moderating effects).

In the present study, we investigated both the indirect effects of cultural values on EI via attitudes and the moderating effects of cultural values on the TPB-relationships.

### **2.2.3. Mediating Effects: Cultural Values, Attitudes and Intentions**

According to Inglehart (1997), culture is the set of shared basic values which help shape people's behaviour in a society. Values are thus a fundamental aspect of a culture. Values are also a powerful force in the formation of attitudes and the occurrence of behaviour (Homer & Kahle, 1988; Hofstede, 2001). They are deeply rooted in the individual and culture, and thus provide criteria for judgments, preferences and choices of behaviour (Williams 1979; Mele 1995). Values play an integral role in human decision-making (Meglino & Ravlin, 1998).

A number of theoretical approaches have been developed and applied to explain the relationship between values and behaviour. One well-established model is that based on cognitive hierarchy theory (Homer & Kahle, 1988). According to this theory, values influence behavioural intention and behaviour indirectly via attitudes. In other words, values are proximally related to attitudes and distally related to behavioural intentions and behaviours. The model therefore implies a hierarchy of cognitions in which the influence theoretically flows from more abstract

(i.e., values) to a middle range (i.e., attitudes) to less abstract (i.e., specific intentions and behaviour) (Homer & Kahle, 1988; Vaske & Donnelly, 1999).

Cognitive hierarchy theory and models derived from it have been tested in a variety of areas, for example: management studies (Shim et al. 1999); consumer behaviour studies (Cai & Shannon, 2012; Durvasula et al., 2011; Koubaa et al., 2011); environmental studies (Vaske & Donnelly, 1999; Schultz et al., 2005; Best & Mayerl, 2013); and social psychology (Milfont et al., 2010). It is widely acknowledged that values indirectly influence intentions and behaviour via attitudes (Defever et al., 2011). And within the field of entrepreneurship, Soininen et al. (2013) showed the values-attitudes-behaviour framework to also be functional. Nevertheless, a coherent framework in which cultural values, attitudes and behavioural intentions are linked to entrepreneurship has yet to be presented and tested. The present study is thus an attempt to fill this gap with the development of an integrated model of entrepreneurial intention. On the basis of both the TPB and cognitive hierarchy theory, we hypothesized that EI would be best predicted by attitudes or the most proximal determinants of EI and attitudes predicted by cultural values or the more distal determinants of EI (see Figure 2.1).

With regard to the cultural determinants of attitudes and thereby EI, we focused on the two important cultural values of individualism and collectivism or the relationship between the individual and the collectivity within a given society. Generally, individualism emphasizes the independent self, uniqueness, achievement, attitudes and personal control. The social ties between individuals within an individualist society tend to be loose. And individualists are largely motivated by their own interests, achievement of their own personal goals and the feeling of pride upon the achievement of personal goals. Collectivism emphasizes group goals, connectedness, social norms and cooperation within the group. The collectivist cares about meeting the expectations of others and maintaining harmony within the group (Hofstede, 1980; Triandis, 1995; Markus & Kitayama, 1991).

With regard to the antecedents of EI, it can be expected that individuals scoring high on individualism will focus mostly on their own personal interests and values (such as a need to achieve and a need for independence); they may thus have more favourable ATE than collectivists. Individuals scoring high on collectivism, in contrast, will focus mostly on meeting the expectations of others and maintaining harmony while doing this; they may thus have higher levels of SN than individualists and seek to comply with the opinions of others when starting their own businesses. In keeping with this, Park and Levine (1999) reported that *independent* self-construal scores (i.e., an individual-level construct of individualism) positively related to attitudes toward behaviour while *interdependent* self-construal scores (i.e., an individual-level construct of

collectivism) positively related to subjective norms. Taken together, the preceding findings led us to formulate the following hypotheses:

**H6:** (a) Individualism will be more likely than (b) collectivism to positively affect attitudes toward entrepreneurship.

**H7:** (a) Collectivism will be more likely than (b) individualism to positively affect subjective norms.

With regard to perceived behavioural control (PBC) or the individual's confidence in their ability to carry out a particular behaviour (i.e., self-efficacy), individualism has been shown to increase the individual's confidence in their own abilities (Geletkanycz, 1997). In contrast, collectivism and concern for mostly the interests of others can inhibit the development of self-efficacy and its expression (Bandura, 1997; Sastry & Ross, 1998; Tafarodi et al., 1999). The self is obviously central to self-efficacy and therefore individualism as opposed to collectivism (Cho, Su, & Lee, 2009). And in light of all this, it can be expected that students with higher individualism will show more perceived self-efficacy than students with higher collectivism. We thus hypothesized that:

**H8:** (a) Individualism will be more likely than (b) collectivism to positively affect perceived behavioural control.

#### **2.2. 4. The Moderating Effects of Cultural Values**

According to Bontempo and Rivero (1992) but also previous theoretical work on cultural values and self-construal (e.g., Markus & Kitayama, 1991; Singelis, 1994; Triandis, 1995), an individualist or collectivist orientation can moderate the effects of motivational perceptions on behavioural intentions. Individualists have an independent construal of the self, tend to pursue individual self-interest and prioritize personal goals over collective goals; their behaviour is guided more by personal attitudes than by social norms. Conversely, collectivists have an interdependent construal of the self, tend to be more sensitive to social evaluation and attach considerable weight to the views of major referents in their social circles; their behaviour is guided more by the anticipated expectations of others or social norms, duties, conformity and obligations than by internal dispositions stemming from personality traits and personal attitudes (Bontempo & Rivero, 1992; Triandis, 1995; Markus & Kitayama, 1991, 1998, 2003; van Hooft & Jong, 2009). Applied to the TPB, Ajzen (2001) points out that collectivism and individualism can determine the relative importance of attitudes and subjective norms for the prediction of intentions. As already pointed out, subjective norms may be more important for collectivists who are known to value the group norm while personal attitudes may be more important for individualists who are known to value independence and fulfilment of their own goals. Empirical research also suggests that cultural orientation at the level of the individual moderates the relationships within the TPB (e.g.,

Park & Levine, 1999; Srite & Karahanna, 2006; van Hooft & Jong, 2009). For example, the study of van Hooft and Jong (2009) suggested an interaction between subjective norms and individual-level collectivism such that individuals low on collectivism were more strongly motivated by attitudes and less by SN than individuals high on collectivism. Studies of entrepreneurship are scarce, but Siu and Lo (2011) confirmed the moderating effects of individualist and collectivist orientations for the relationships within the TPB in a Chinese context. Their results showed the relationship between SN and EI to be positively moderated by a collectivist orientation at the level of the individual.

On the basis of these empirical insights but also previous theoretical insights (Markus & Kitayama, 1991; Oyserman et al., 2002; Triandis, 1995; Bontempo & Rivero, 1992), we thus formulated the following hypotheses about the moderating effects of individual cultural orientations.

**H9:** *The more individualist the individual, the stronger the relationships of (a) attitudes toward entrepreneurship and (b) perceived behavioural control with entrepreneurial intentions but the weaker the relationship of (c) subjective norms with entrepreneurial intentions.*

**H10:** *The more collectivist the individual, the weaker the relationships of (a) attitudes toward entrepreneurship and (b) perceived behavioural control with entrepreneurial intentions but the stronger the relationship of (c) subjective norms with entrepreneurial intentions.*

**H11:** *The more individualist the individual, the weaker the relationships of subjective norms with (a) attitudes toward entrepreneurship and (b) perceived behavioural control.*

**H12:** *The more collectivist the individual, the stronger the relationships of subjective norms with (a) attitudes toward entrepreneurship and (b) perceived behavioural control.*

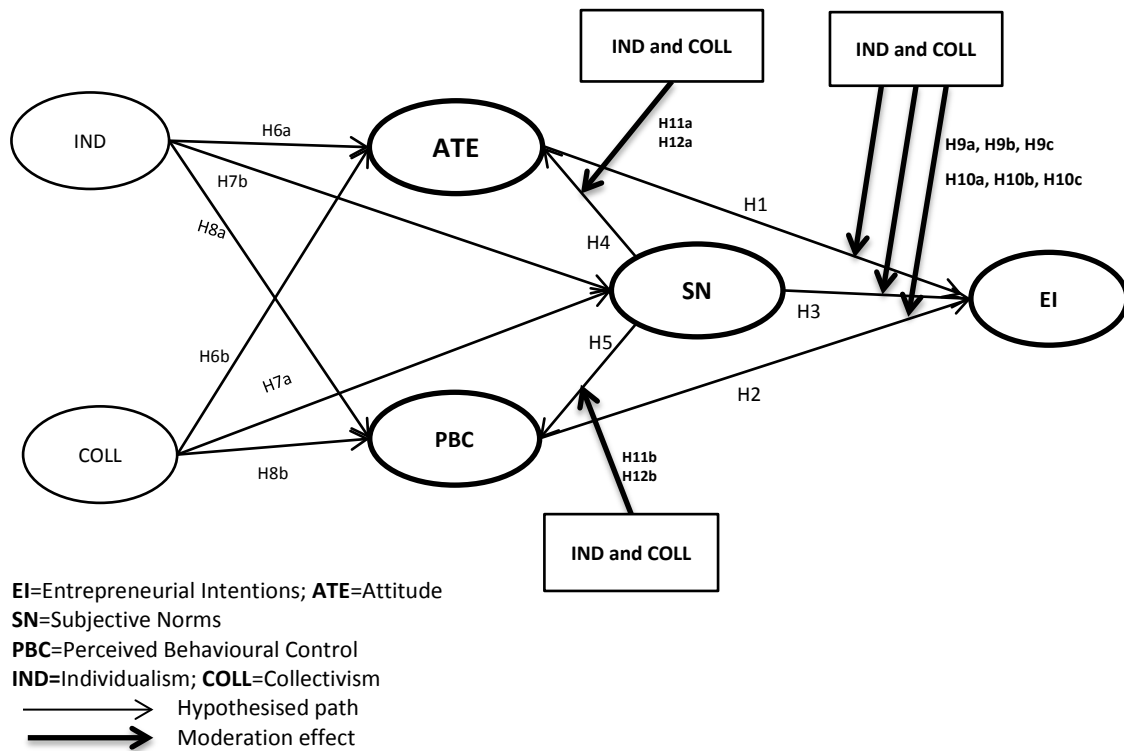


Figure 2.1 The proposed research model

## 2.3 Research Method

### 2.3.1 Sample and Data Collection

Data was collected from 300 undergraduate students following elective entrepreneurship courses offered at seven public universities in Iran during the 2010–2011 academic year. All of the students were in their last year of college, and they were targeted for two reasons. First, students following such courses have been shown to be more likely to start a business than other students (Wu & Wu, 2008). Second, students in their final year of college are facing major career decisions and known to have a clearer vision of their futures (Krueger et al., 2000; Krueger & Kickul, 2006).

The universities were traditional; granted both undergraduate and graduate degrees in a variety of subjects; had a broad educational focus; and were located in such provincial capitals of western Iran like Tehran and Arak. The universities were uniform with regard to being subject to national rules and regulations but also having central administrations appointed by the Ministry of Science, Research and Technology.

With the approval and cooperation of the lecturers, questionnaires were distributed for voluntary completion by the students at the beginning of a class session. The original questionnaire was in English. It was modified slightly for purposes of the present research, carefully translated into Persian and then translated back into English to check the adequacy of

the translation. The questionnaire was then distributed to a pilot group of 28 undergraduate students to determine its clarity and the face validity of the constructs. The students comprehended the translated questionnaire after minor changes. The group of 300 students given 30 minutes to complete the questionnaire and received a small gift for doing so. A total of 268 questionnaires were completed, which is a response rate of 89%. The completed questionnaires were screened for missing data and outliers (Hair et al., 2009), which resulted in 255 usable questionnaires.

The sample consisted of agriculture engineering students (62%), computer engineering students (20.8%) and humanities students (17.2%). There were 97 male students (38 %) and 158 female students (62%). There was a greater number of agriculture engineering than other students in the sample because the majority of the students participating in the entrepreneurship courses at the time of the study were from this field of study. The sample consisted of 86 male students (42%) and 119 female students (58%), with an average age of 21.68 years. There were more females in the sample because more females were enrolled in the degree programmes than males and about 60% of the Iranian university population in general is female. Given that the students were in their last year of college, a high validity of self-reported EI could be assumed (Ajzen, 1991). About 14% of the students reported having employment experience and 6% reported having self-employment experience.

**Table 2.1** Distribution of students according to university

University	Region	The number of undergraduate students following entrepreneurship courses in the last year of their degrees during the first semester of the 2010–2011 academic year	Number in the sample
Tehran University	Tehran	45	31
Al Zahra University	Tehran	65	30
Qom University	Qom	35	25
Kordestan University	Sanandaj	82	52
Shahr Kord University	Shahr Kord	81	48
Arak University	Arak	45	37
Bu-Ali Sina University	Hamedan	41	32
Total		394	255
Sample Error		± 3.6 at a 95% confidence level ( $Z=1.96, p=q=0.5$ )	

### 2.3.2 Measures

The students responded to 37 questionnaire items along a seven-point Likert scale (1 = *strongly disagree*; 7 = *strongly agree*). All of the questionnaire items were adopted from existing scales (see Table 2.2 for sample items and their sources). Individualism was measured in terms of the

importance given to personal independence, achievement, uniqueness, privacy and competition. Collectivism was measured in terms of the importance given to the group, relatedness to others, consulting others, harmony, and a sense of belonging and contextual self.

### 2.3.3 Control Variables

According to the TPB, exogenous variables including the demographic characteristics of individuals can be expected to *indirectly* influence (and thereby predict) their behavioural intentions via the antecedents to behavioural intentions (e.g., Ajzen, 1991; Robinson et al., 1991; Conner & Armitage, 1998; Kruger et al., 2000; Zhao, Hills, & Siebert, 2005; Kolvereid & Isaken 2006; Liñán & Chen, 2009; Liñán et al., 2011). Information on eight demographic background and university variables was therefore collected in the present study: age (in years); gender (1 = male, 0 = female); self-employment experience (0 = no, 1 = yes); employment experience (0 = no, 1 = yes); academic national ranking of the university (3 = high, 2 = intermediate, 1 = low); region of the university (1 = in the capital Tehran, 0 = not in Tehran); and size of the university (1 = small with less than 10000 students, 2 = large with more than 10 000 students). The names of the universities were also coded in order to examine the results in terms of the dependent and independent variables according to university (categorical variable for the 7 selected universities).

**Table 2.2** List of constructs

Measure	Literature Source and Sample Questionnaire Item from Present Study	No. of Items
Entrepreneurial Intentions	Liñán and Chen (2009). <i>I'm ready to do anything to be an entrepreneur.</i>	6
Attitudes toward Entrepreneurship	Liñán and Chen (2009). <i>Being an entrepreneur implies more advantages than disadvantages for me.</i>	5
Subjective Norms	Adopted from Kolvereid (1996b); also used in Kolvereid and Isakson (2006), Krueger et al. (2000), and Souitaris et al. (2007). Belief: <i>I believe that my closest family thinks that I should start my own business.</i> Motivation to comply: <i>I care about my closest family's opinion with regard to me starting my own business.</i> The belief items were recoded into a bipolar scale with a range of -3 to +3 and then multiplied by the respective motivation-to-comply items.	6
Perceived behavioural control	Liñán and Chen (2009). <i>Starting a firm and keeping it viable would be easy for me.</i>	6
Individualism	Adopted from Oyserman et al.'s (2002) meta-analysis, as utilized by van Hooft and Jong (2009). <i>I like to live my life independent of others.</i>	7
Collectivism	Adopted from Oyserman et al.'s (2002) meta-analysis, as utilized by van Hooft and Jong (2009). <i>Before making a decision, I always consult with others.</i> Plus one item adopted from Triandis (1995). <i>It is my duty to take care of my family, even when I have to sacrifice what I want.</i>	7

## 2.4 Analysis and Results

### 2.4.1 Exploratory Factor Analysis

Exploratory Factor Analysis (EFA) was used to identify significant factors underlying the questionnaire responses. The following items were eliminated either because their factor loadings were under .50 or their cross loadings were greater than .40: One item for EI, one item for ATE, one item for PBC, two items for individualism and two items for collectivism. A new factor analysis was then performed on the 27 remaining items. A high value for the KMO measure of sampling adequacy (KMO=0.845, higher than a minimum of 0.60) and a highly significant Bartlett test of sphericity (chi-square: 3011.261; Significance:  $p < .00$ ) indicated that the data and sample were adequate and suitable for the conduct of an EFA (Field 2009).

As can be seen from Table 2.3, all of the items loadings — after the elimination of the items noted above — were acceptable ( $>0.5$ ). This initial factor solution produced the expected six factors, which together explained 56.91% of the variance in the questionnaire responses. The eigenvalues were all greater than 1.0, which shows the items to constitute valid and important explanatory factors (Field 2009). The reliability value for each construct was greater than 0.70, which is acceptable and shows the measurement scales to be stable and consistent (Hair et al. 2006).

As shown in Table 2.4, the mean score for individualism was 4.86 (along a scale of 7), which shows a modest tendency toward individualism and personal interest as values of importance to the students. The mean score for collectivism was a larger 5.84 (also along a scale of 7), which shows the group and goals of the group to be important for the students in our study along with the needs and well-being of their families, friends and colleagues. The individualist and collectivist values of the students thus varied but were generally more collectivist than individualist. This finding is in line with the assumption that people in more collectivist cultures will generally be more collectivist than individualist (Triandis et al., 1988). The finding also confirms the assumption that individualism and collectivism are *not* part of a single continuum (Triandis, 1994) and that students can indeed exhibit a mix of both cultural values.



**Table 2.3** Results of initial exploratory factor and reliability analyses

Construct	Items	Factor Loading	Cronbach's alpha
<b>Entrepreneurial intentions</b>	Y1: I'm ready to do anything to be an entrepreneur.	.680	.84
	Y2: My professional goal is becoming an entrepreneur.	.731	
	Y3: I will make every effort to start and run my own business.	.808	
	Y4: I'm determined to create a firm in the future.	.756	
	Y5: I have very seriously thought about starting a business.	.568	
<b>Attitudes toward entrepreneurship</b>	X1: A career as an entrepreneur is totally attractive to me.	.752	.80
	X2: Amongst various options, I would rather be anything but an entrepreneur.	.848	
	X3: Being an entrepreneur would give me great satisfaction.	.810	
	X4: Being an entrepreneur implies more advantages than disadvantages to me.	.672	
<b>Subjective norms</b>	X5: Closest family (recoded belief × motivation)	.856	.84
	X6: Closest friends (recoded belief × motivation)	.818	
	X7: Important others(recoded belief × motivation)	.806	
<b>Perceived behavioural control</b>	X8: Starting a firm and keeping it viable would be easy for me.	.793	.88
	X9: I believe I would be completely able to start a business.	.793	
	X10: I am able to control the creation process of a new business.	.736	
	X11: If I tried to start a business, I would have a high chance of being successful.	.661	
	X12: I know all about the practical details needed to start a business.	.773	
<b>Individualism</b>	X13: I prefer to work alone than in teams.	.689	.74
	X14: It is important to me that I perform better than others on a task.	.715	
	X15: I like to live my life independent of others.	.831	
	X16: I like my privacy.	.745	
	X17: I am unique and different from others in many respects.	.528	
<b>Collectivism</b>	X18: I would help, within my means, if a relative were in financial difficulty	.651	.74
	X19: I would rather do a task in a group than do one alone.	.774	
	X20: It is my duty to take care of my family, even when I have to sacrifice what I want	.708	
	X21: Before making a decision, I always consult with others	.802	
	X22: To me, pleasure is spending time with others	.553	

**Table 2.4** Means, standard deviations and correlations with square roots of the Average Variance Extracted (AVE) along the diagonal

Variable	Mean	SD	1	2	3	4	5	6
1-Entrepreneurial intention	4.82	1.41	<b>(.71)<sup>a</sup></b>					
2- Attitudes	6.11	.97	.43**	<b>(.75)</b>				
3- Subjective norms	3.14	5.84	.38**	.16*	<b>(.78)</b>			
4- Perceived behavioural control	4.30	1.36	.60**	.21**	.45*	<b>(.76)</b>		
5- Individualism	4.86	1.16	.12	.16*	.08	.21**	<b>(.68)</b>	
6-Collectivism	5.84	.97	.15*	.15*	.17*	.13*	.04	<b>(.67)</b>

Correlation is significant at the 0.01 level (2-tailed).

\*. Correlation is significant at the 0.05 level (2-tailed).

<sup>a</sup> The square roots of AVE estimates in bold on the diagonal

## 2.4.2 Structural Equation Modelling

We next analysed the data using SPSS18 and AMOS18. Structural Equation Modelling (SEM) was used to validate the model identified by the exploratory factor analyses and to test for the direct, indirect and moderating effects of the cultural and antecedent variables in the prediction of EI. SEM is a widely accepted method for the analysis of data in the behavioural and social sciences (Baumgartner & Homburg, 1996; Shook et al., 2004). SEM was particularly relevant for the present study because of its ability to simultaneously handle a series of dependence relationships and their direct and indirect effects within a model (Hair et al., 2010). SEM thus has the advantage of allowing us to understand the pattern of relationships and direct/indirect effects on the TPB components and entrepreneurial intentions (Linan et al., 2013).

According to Hair et al. (2006), it is appropriate to adopt a two-step approach for SEM: first, assessment of the measurement model; second, assessment of the structural model.

### 2.4.2.1 Assessment of the Measurement Model

The results of a Confirmatory Factor Analysis (CFA) showed the initial measurement model to provide an acceptable fit for the data ( $\chi^2 = 442.341$ ;  $\chi^2/df = 1.455$ ; GFI = .888; TLI = .942; CFI = .949; IFI = .950; RMSEA = .042). On the basis of the modification indices and to obtain a model with an even better fit, two indicators (X17 and X22) were eliminated. The revised measurement model provided a reasonable fit (Table 2.5). The hypothesized model with six factors was thus judged suitable for the SEM.

**Table 2.5** Summary of Goodness of Fit indices for the measurement model

Fit indices	$\chi^2$	P	$\chi^2/df$	GFI	CFI	TLI	IFI	RMSEA
Value	362.048	.000	1.420	.900	.959	.952	.960	.041
Suggest value		>.05	<3	>.80	>.90	>.90	>.90	<.07

*Convergent validity:* A first condition for convergent validity is that the standardized factor loadings should all be significant (have a critical ratio > 1.96) with a value of more than 0.50 (Janssen et al., 2008). Table 2.6 shows the critical ratios for the factor loadings (CR= t) to all exceed 6.55 ( $p < 0.01$ ) and the factor loadings to all have values greater than 0.50. This shows good convergent validity. For the composite or construct reliability to be adequate, a value of 0.70 or higher is recommended (Nunnally & Bernstein, 1994). As shown in Table 2.6, all of the constructs had construct reliabilities which were greater than the recommended 0.70. The results also show the Average Variance Extracted (AVE) estimate for all of the constructs to be above or close to the recommended threshold of 0.50 (Fornell & Larcker, 1981).

*Discriminant validity:* According to Fornell and Larcker (1981), if the square root of the AVE estimate for each construct is greater than the correlation between that and all of the other constructs in the model, then discriminant validity is demonstrated. As shown in Table 2.4, the square root of each AVE is greater than its correlations with the other constructs. This means that the indicators have more in common with the construct that they are associated with than with the other constructs (Fornell & Larcker, 1981). Discriminant validity has thus been demonstrated for the constructs in the measurement model.

**Table 2.6** Results of confirmatory factor analysis for the proposed model

Latent variable	Items	Standardized Factor Loading	T-value	Construct Reliability	AVE
Entrepreneurial intention	Y1	.64		.89	.51
	Y2	.76	8.34**		
	Y3	.78	9.96**		
	Y4	.70	7.93**		
	Y5	.62	7.59**		
Attitudes toward entrepreneurship	X1	.75		.90	.56
	X2	.82	9.59**		
	X3	.77	11.34**		
	X4	.64	11.89**		
Subjective norms	X5	.80		.89	.61
	X6	.80	11.70**		
	X7	.74	11.19**		
Perceived behavioural control	X8	.70		.92	.58
	X9	.90	14.13**		
	X10	.80	10.99**		
	X11	.66	9.28**		
	X12	.71	10.71**		
Individualism	X13	.57		.84	.46
	X14	.57	6.55**		
	X15	.81	7.76**		
	X16	.72	7.60**		
Collectivism	X18	.60		.84	.45
	X19	.76	7.94**		
	X20	.57	6.80**		
	X21	.72	7.84**		

\*\* $P < .01$

#### 2.4.2.2 Assessment of the Structural Model

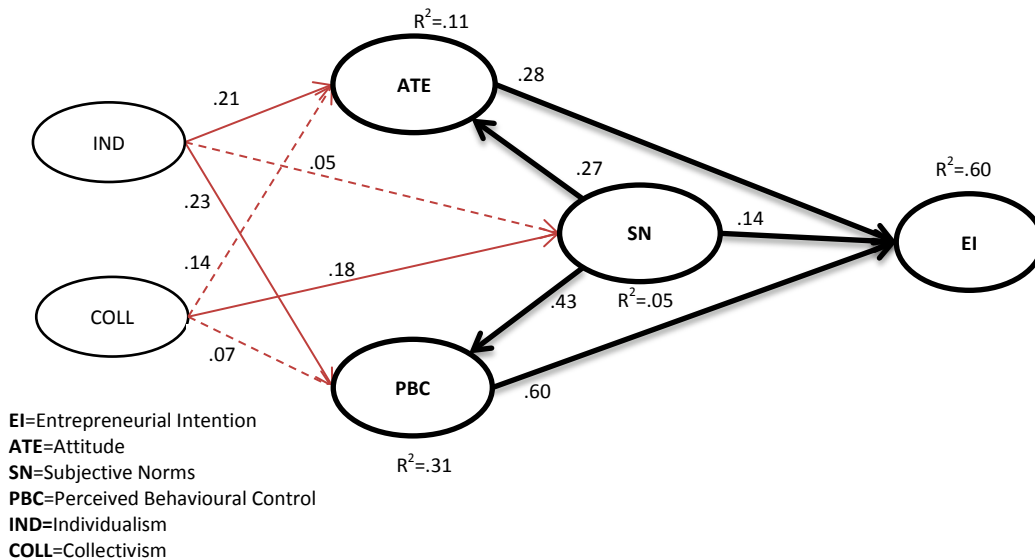
Once a satisfactory measurement model was obtained, the second step involving SEM was undertaken. As can be seen from Figure 2.2, the overall goodness of fit statistics for the structural model indicates a good fit. To determine whether the model provides the best-fitting solution, we compared it to two other models. In the alternative models, direct paths were added from individualism and collectivism to EI. The results showed model fit to not improve significantly; the added paths were not significant ( $p > .05$ ). The proposed structural model thus provided the best-

fitting model and could thus be used to examine our hypotheses.

Having assessed the fit indices for the measurement model and structural model, the estimated coefficients for the causal relationships within the proposed model were examined. As shown in Figure 2.2, hypotheses 1, 2 and 3 were confirmed. This provides support for the TPB and its applicability for understanding the entrepreneurial intentions of students but also in a developing, collectivist country, namely Iran. Hypothesis 2 (i.e., the SN-EI relationship) received marginal support ( $\beta = 0.14, p=0.051$ ), which is similar to the finding for Iran from Moriano et al. (2012). Hypotheses 4 and 5 were also confirmed, indicating that SN also has an indirect effect on EI via ATE and PBC. These findings probably account for the weak relationship between SN and EI.

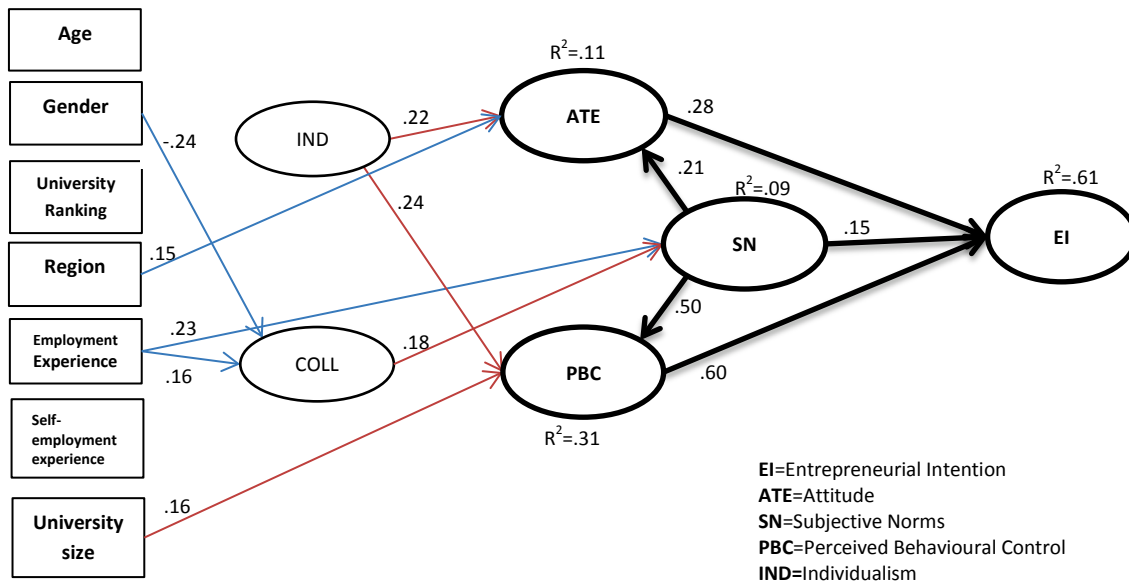
Hypotheses H6, H7, and H8 were also confirmed. Individualism exerted significant positive effects on ATE and PBC while collectivism exerted a significant positive effect on SN.

The rejection of alternative models which included a direct path from each of the cultural values to EI shows the effects of individualism on EI to be fully mediated by ATE and PBC while the effects of collectivism on EI are fully mediated by SN. In other words, cultural factors do not directly affect entrepreneurial intentions but, rather, the social-cognitive determinants of these. Support is thus provided for the TPB assumption that more distal individual factors influence behavioural intentions via key antecedents (Fishbein & Ajzen, 2010).



The goodness of fit indices:  $\chi^2=367.733$ ;  $\chi^2/df=1.425$ ; GFI=.898; TLI=.952; CFI=.958; IFI=.959; RMSEA=.041

**Figure 2.2** Path model estimates for the proposed model



The goodness of fit indices:  $\chi^2=524.527$ ;  $\chi^2/df=1.366$ ; GFI=.881; TLI=.942; CFI=.949; IFI=.950; RMSEA=.038

**Figure 2.3** Path model estimates for the proposed model with control variables

When a number of other background demographic variables were entered into the proposed structural model (Figure 2.3), none of them significantly influenced EI directly. The exogenous background variables only influenced some of the *antecedents* of EI directly and thus intentions indirectly, as the TPB posits (Fishbein & Aizen, 2010). Age did not significantly affect the antecedents of EI or the culture variables of individualism and collectivism. This is probably due to the narrow age range studied. Experience with self-employment also did not play a role, probably due to the small number of participants with such experience. Gender and being female in particular showed a considerably large influence on collectivism ( $\beta = - 0.24$ ). This means that collectivist values were more important among the female students in our study than among the male students. Employment experience significantly affected SN; prior employment experience created more positive perceptions of what influential people might think of the student starting a business. The results also showed studying at a university located in the capital, Tehran, to increase students' ATE. Students studying at Teheran universities apparently find the university climate and culture conducive to entrepreneurship. An ANOVA with the categorical variable of university (i.e., 7 coded universities) as the independent variable showed no significant differences in collectivism, individualism, SN, PBC or EI across the universities, however. In the end, the proposed model explained 61% of the variance in EI ( $R^2 = .61$ ). The present model also explained some 11% and 31% of the variances in ATE and PBC, respectively.

### 2.4.3. Moderating Effects of Cultural Values

A common approach for evaluating moderation within a SEM framework is to analyse groups created on the basis of levels of the suspected moderator variables (Kline, 2005). Dichotomizing continuous variables such as individualism and collectivism to create groups, however, reduces power (Cohen, 1983; MacCallum et al., 2002). It is therefore recommended that moderated multiple regression analyses be conducted to evaluate continuous moderators (Baron & Kenny, 1986; Frazier et al., 2004). We decided to do this with a mean-centring procedure for both the independent and moderating variables to reduce the possibility of multicollinearity among the variables (Aiken & West, 1991).

The results of are reported in Table 2.7. To maintain power, *separate* regression analyses were conducted for individualism and collectivism. We initially entered the control variables, which did not exert significant effects on EI and were therefore excluded from the subsequent analyses. As can be seen from Table 2.7, only the interaction between ATE and individualism significantly contributed to the prediction of EI with a beta-weight of .09. This means that those students with more individualist values which emphasize personal independence and achievement also showed a greater contribution of their ATE to the prediction of their EI.

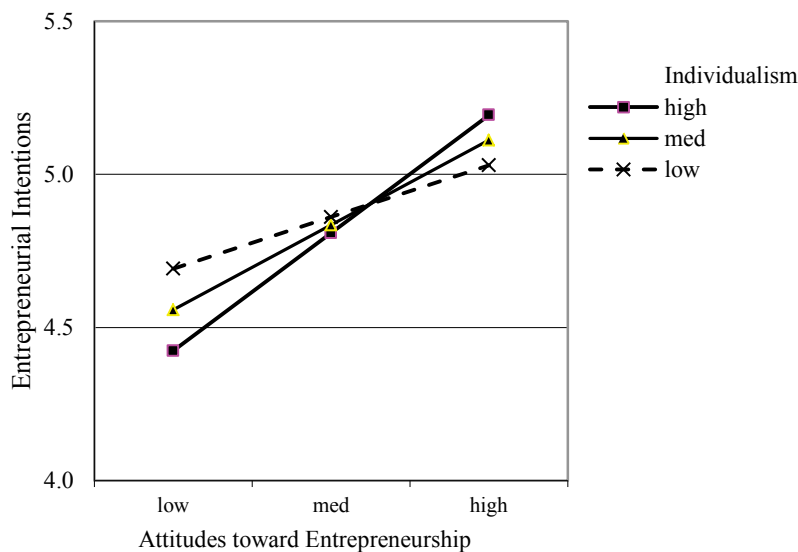
We next plotted the slope of the attitude scores on the EI scores for three levels of individualism (i.e., individualism scores 1 SD above the mean score, mean individualism score and individualism scores 1 SD below the mean score, Figure 2.4) (Aiken & West, 1991). Consistent with hypothesis (H9a), the relationship between ATE and EI was found to be significantly stronger for higher levels of individualism ( $B = .39$ ) than for lower levels of individualism ( $B = .17$ ), although both of the simple slopes were significantly different from zero [ $t(251) = 6.60, p > .001$  and  $t(251) = 2.83, p > .01$ , respectively].

To determine the possibly moderating effects of individualism and collectivism on the relationship of SN with ATE and PBC, we followed the same procedure. The results showed none of the relevant interactions to contribute to the prediction of EI; individualism and collectivism did not moderate the effects of SN on ATE or PBC.

**Table 2.7** Moderated regression analyses of the influence of individualism, collectivism, TPB variables and interactions on entrepreneurial intentions

predictor	Entrepreneurial intentions ( $\beta$ )		
	Step 1	Step 2	
		Individualism	Collectivism
<b>Step 1: Main effects</b>			
Individualism	-0.03	-0.02	-0.03
Collectivism	0.04	0.03	0.03
Attitudes toward entrepreneurship	0.30**	0.30**	0.30**
Subjective norms	0.11*	0.10*	0.11*
Perceived behavioural control	0.52**	0.52**	0.53**
<b>Step 2: Interaction terms</b>			
Attitudes toward entrepreneurship $\times$ Individualism		0.09*	
Subjective norms $\times$ Individualism		-0.08	
Perceived behavioural control $\times$ Individualism		-0.07	
Attitudes toward entrepreneurship $\times$ Collectivism			0.04
Subjective norms $\times$ Collectivism			0.03
Perceived behavioural control $\times$ Collectivism			0.02
Multiple R	0.65**	0.67**	0.66**
$\Delta R^2$		0.02*	0.003
Adjusted $R^2$	0.41**	0.43**	0.41**

Note. \* $P < 0.05$ ; \*\* $p < 0.01$



**Figure 2.4** Simple regression slopes of attitudes on intentions at three levels of individualism

## 2.5 Discussion

Based on the theory of planned behaviour (TPB), cognitive hierarchy theory, self-construal theory, Bontempo and Rivero’s theory and the research literature on cultural orientations, we developed a more integrated model of entrepreneurial intention. We did this in order to gain insight into the determinants of the entrepreneurial intentions (EI) of students in general and those in a largely collectivist, developing country — namely Iran — in particular. By measuring cultural values at the

individual level and directly incorporating cultural values into our model of entrepreneurial intention, our study contributes to the development of a theoretical framework and research context in which the influences of cultural values can be tested within a cognitive model of EI.

Our results revealed significant relationships between EI and its antecedents, with a notably high percentage of the variance in EI explained by the model. Additional evidence is thus provided for the generalizability and applicability of the TPB for the prediction and understanding of entrepreneurial intentions within a non-Western cultural context.

The magnitude of the effects of the different antecedents of EI varied in our study. This finding is in line with the assertions of Fishbein and Aizen (2010) who argue that the antecedents of behaviour can vary considerably and sometimes even be non-significant depending on situational and contextual factors. Of the three antecedents of EI included in our model, SN proved least important for the prediction of EI. This shows the EI of Iranian students to draw more on individual considerations than on social or normative considerations.

This finding is also in line with the findings of Moriano et al. (2012) and Karimi et al. (2012, 2013), who both showed SN to be the weakest predictor of EI in Iran. The finding is also consistent with the results of studies in other countries (e.g., Autio et al., 2001). It is thus possible that the making of entrepreneurial career decisions is of such importance that young people are not likely to be heavily influenced by the opinions of others. As the present study indicated, it is also possible that the influence of SN on EI is mainly indirect (i.e., via ATE and PBC). However, in other research within the collectivist culture of China, SN showed a relatively strong direct effect on EI – an effect which was even stronger than the effects of ATE and PBC on EI (Siu and Lo 2011).

One explanation for these discrepant findings may lie in the cultural contexts of Iran versus other collectivist countries like China and Japan. In his famous IBM Study, Hofstede (1980, 2001) found Iran to score 41 out of 100 countries on individualism while the average for Muslim countries was 38 but China's individualism score was only 20. This suggests that Iran is a country positioned in the "near Eastern" cluster of countries, which includes Turkey and Greece, along the individualism continuum (Ronen & Shenkar, 1985). Collectivism in Iran may differ from collectivism in China or Japan, moreover. Iranian people show largely individualist attitudes and behaviours when it comes to the workplace but not the family (Tayeb 1994, 2001; Dastmalchian et al., 2001). In contrast, in Japan, collectivism carries over from the family into the workplace (Tayeb, 1994).

In a similar vein, the results of the GLOBE study (House et al., 2004) show Iran and China to indeed score very close to each other and very high on family collectivism while China *also* scores very high for societal collectivism but Iran scores very low for this with a high degree of individualism and a strong orientation toward achievement instead (Javidan & Dastmalchian,



2003). The findings of our study similarly show Iranian students to have a mix of cultural values: They score high on collectivism (Mean = 5.84 along a scale of 1-7) but also relatively high on individualism (Mean = 4.86 along a scale of 1-7).

Iran's dominant Muslim religious tradition differs from the Confucian/Buddhist religious traditions of China. The political system in Iran also differs from the communist political system which has dominated contemporary China. Due to its unique historical, linguistic and racial identity, Iran's culture also differs from the cultures of other Muslim countries (Ali and Amirshahi 2002). In future studies of entrepreneurial intention and behaviour, the differing cultural backgrounds of Iran compared to other Muslim countries should thus be taken into account.

Our research setting and sample characteristics may also be responsible for at least part of the contradictory findings. Our sample was made up of undergraduate students with different academic majors and the majority of them were female while the sample in Sui and Lo's study was made up of only MBA students and the majority of them were not only male but also older than the students in our study. In their study with Chinese students from various academic majors, Wu and Wu (2008) found subjective norms to be the weakest predictor of EI, which is in keeping with our results. However, when Kautonen et al. (2013) collected data from adult populations in Austria and Finland, they found subjective norms to most strongly affect EI. Future research should therefore explore the effects of SN on different samples of students from various academic majors and educational levels but also in adult populations.

As suggested by Liñán and his colleagues (Liñán & Santos, 2007; Liñán, 2008; Liñán & Chen, 2009; Liñán et al., 2011), we found SN to be an important determinant of the other antecedents of EI, namely ATE and PBC. This means that the perceptions of the close environment of the students influence their EI but largely indirectly. In other words, when individuals feel that influential people in their lives are supportive of their idea to start a business, the individuals will also be more attracted to the option and feel more capable of doing this than other individuals (Liñán et al., 2011).

Perceived behavioural control (PBC) has been shown to significantly influence EI in both the present study and other studies conducted in individualist and collectivist societies (e.g., Krueger et al., 2000; Liñán & Chen, 2009; Siu & Lo, 2011). The hypothesized major role for PBC in the determination of EI thus receives support. PBC showed the strongest effect on EI in the present study. In keeping with this, Autio et al. (2001) have argued that PBC is the most important factor when investigating entrepreneurial intentions and noted that the decision to start a business has more significant consequences than the decision to — for example — vote or lose weight. The latter endeavours are argued to require considerably less volitional control than starting a business. And the role of PBC may be even more marked within the developing context of Iran.

Given unstable economic and political conditions, which are obviously unfavourable to entrepreneurial initiatives, confidence in one's ability to start and run a business can be expected to be a strong predictor of entrepreneurial intentions. Another plausible explanation for this strong finding may lie in Iran scoring very low for so-called uncertainty avoidance: the country's mean score of 3.67 is lower than the world mean of 4.16 but also lower than the means for such collectivist countries as China (4.94), India (4.02) and Japan (4.07) (House et al., 2004). This suggests that Iranian students are not afraid of uncertain situations and have a strong tolerance for ambiguity, which implies — in turn — that they may be particularly capable of coping with the uncertainty of a business start-up. Future research should nevertheless explore the relationships between PBC and uncertainty avoidance within an Iranian cultural context but also other cultural contexts in order to enhance the predictive capabilities of the TPB and models of entrepreneurship based upon this.

No *direct* influence of the demographic variables (control variables) included in our study on EI were found. However, some of the variables did affect the antecedents to EI, which is in keeping with the TPB and the expectation that external variables will only *indirectly* influence EI via its antecedents.

Viewed in general, our findings provide support for the indirect influence of cultural values on EI via attitudes (Homer & Kahle, 1988). The cultural value of individualism influenced EI via ATE and PBC while the cultural value of collectivism influenced EI via SN. Higher levels of individualism thus resulted in more positive ATE and PBC, which in turn resulted in more positive EI. Higher levels of collectivism, however, resulted in higher levels of concern for the opinions of others and in turn higher levels of EI. In the words of Bochner (1994): collectivists are more “sensitive to the demands of their social context and more responsive to the assumed needs of others” than non-collectivists. These findings confirm the assumption of Fishbein and Aizen (2010), namely that values are important but more distal predictors of intention and behaviour. Values influence intention and behaviour indirectly via their influence on beliefs and attitudes.

Our study found only partial support for the moderating effects of cultural values at the level of the individual for the relationships between the variables in the TPB. As expected, ATE strongly predicted the EI of those students reporting high levels of individualism in particular. Attitudes toward behaviour involve an individual's overall assessment of the advantages and disadvantages of performing a given behaviour (e.g., starting a business). Self-interest and personal evaluation tend to be core attributes of people with individualist values (Markus & Kitayama, 1991; Triandis, 1995), and individualists can thus be expected to have largely independent self-construal and allow their behaviour to be guided by their own attitudes more than those of others (Markus & Kitayama, 1991; Triandis, 1995). Other research has also shown

individualism to moderate the relationship between attitudes toward behaviour and behavioural intentions, as we also found (Bagozzi et al., 2000; Kacen & Lee, 2002).

Moderating effects of individualism were not found for the associations of SN with EI or for the associations of SN with ATE and PBC. These results suggest that the positive relationships between these variables hold regardless of the individualist values of students. The results were nevertheless unexpected, and we do not have an explanation for why individualism did not moderate many of the relationships in our model. Additional study is thus needed to clarify the results and refine the relationships within our model of EI.

The cultural moderation of the relationship between PBC and EI was not supported. That is PBC remained the strongest predictor of EI regardless of cultural values. One plausible explanation for this finding is that we examined entrepreneurial intentions, not actual entrepreneurial behavior. PBC has been shown to also exert a direct effect on entrepreneurial behavior (Kautonen et al., 2013), but perhaps the strength of this relationship is influenced by cultural values. Therefore, by not examining actual entrepreneurial behavior, this potentially substantial effect remains unclear. Consequently, the expectation that the relationship between PBC and becoming an entrepreneur is higher for individual with high individualistic orientation may be evident when examining actual entrepreneurial behavior.

Also contrary to what we hypothesized, collectivism did not moderate the relationships between EI and its antecedents in our study. This is in contrast to the results of other studies showing collectivism to moderate the size of the correlations between not only SN and EI (e.g., Siu & Lo, 2011) but also attitudes and intentions (e.g., Ybarra & Trafimow, 1998). The lack of a moderating effect of cultural values on SN may be due to SN only having a weak effect on EI in our study as SN was found to be the strongest predictor of EI in the work of Siu and Lo (2011). As already noted, however, sample characteristics may also account for these contradictory findings.

The present results might be also interpreted within the context of Iranian society where highly collectivistic values tend to be more normative (Hofstede, 1983; House et al., 2004) and thus exhibit less variance. Future research should be undertaken to replicate these findings but also extend to them other circumstances and cultural contexts. It is certainly possible, for example, that collectivist values may come more into play during the later stages of the entrepreneurial process or, as suggested by the results of the present study, remain distal antecedents of EI and thus exert an only an effect via other, more proximal antecedent to EI such as SN.

## 2.6 Implications

Our findings provide support for the TPB and its applicability for understanding the entrepreneurial intentions of Iranian students. All three motivational antecedents are important for intention formation but to different degrees. In other words, our findings show how the contributions of the antecedents of behavioural intentions can vary across situations and for different behaviours (Ajzen, 1991). In addition, our findings support the conclusion that external variables such as cultural values can indirectly influence behavioural intention via its antecedents and/or the relative importance of attitudes, SN and PBC in the prediction of behavioural intention (Fishbein, 1980; Fishbein & Ajzen, 2010). By examining cultural values at the level of the individual and integrating this information into a cognitive model of EI, we have contributed to a better understanding of the precursors of EI. Our findings show the influence to flow from relatively stable, abstract cultural values to more concrete, domain-specific attitudes to entrepreneurial intentions in the end, which also provides support for cognitive hierarchy theory. Finally, our findings indicate that The TPB works somewhat differently depending on the students' cultural value orientations, which also provides support for the theory of Bontempo and Rivero and self-construal theory.

With regard to educational policy and practice, our findings confirm the importance of individual ATE, SN and PBC for the development of EI. Support should thus be provided for all of these antecedents of EI. Entrepreneurship education programmes should pay special attention to increasing students' PBC and to encouraging positive ATE and positive SN in order to increase students' EI. Several scholars claim that self-efficacy or, in other words, PBC is a learned characteristic which can thus change and develop over time (Erikson, 2003; Wakkee et al., 2008). According to Bandura (1977, 1986), self-efficacy can be fostered using four methods of which the most potent are mastery experiences and vicarious experience (i.e., modeling). Educators can thus adopt an action learning approach with teaching methods and course characteristics which give students opportunities to obtain experience and develop the skills needed to be an entrepreneur (e.g., business planning, business internships). Educators should also consider including entrepreneurial role models as part of the curriculum because such role models have indeed been shown to foster student confidence in their ability to start a business (Karimi et al., 2013).

Policy makers should work to increase social awareness of the relevance of entrepreneurship and promote favourable perceptions of entrepreneurship. SN significantly influence PBC and ATE, which means that student confidence in their ability to start a business and favourable/unfavourable attitudes toward entrepreneurship may *depend* at least in part on

the way in which family, friends and relatives view entrepreneurship. Informing the public of the positive aspects of entrepreneurship (e.g., job creation, wealth creation, innovation) can foster favourable perceptions of entrepreneurship. Reduced bureaucracy, fewer regulations and limited rules for starting an enterprise might also convey the message that becoming an entrepreneur is valued by both government and society; students may then experience more positive SN as a result and develop both higher PBC and more positive ATE.

Specific instructional methods and curricula which are specially designed to improve SN should also be developed and incorporated into entrepreneurship education programmes. The instructional methods might include teamwork, giving students opportunities to build a network with other entrepreneurially-minded students and contact with experienced entrepreneurs who are willing to serve as role models (Souitaris et al., 2007; Mueller, 2011; Weber, 2012; Karimi et al., in press). Given that the entrepreneurial attitudes and intentions of students are also determined in part by their cultural values, universities and other educational institutions should also take this information into account when developing and implementing instructional methods, entrepreneurship programmes and support strategies. Both individualism and collectivism influence the antecedents of behaviour but in different ways, and individualism is known to play a *particularly important role* in the motivational antecedents to entrepreneurship. Universities should take this knowledge into account and thus promote the development of the individualist values which are known to play a role in entrepreneurship such as an orientation toward achievement, independence and autonomous thinking.

## 2.7 Limitations and directions for future research

At this point, some possible limitations on the present study can be mentioned as directions for future research. First, the sample consisted of students already participating in entrepreneurship courses at Iranian public universities. Future studies should therefore consider both public and private universities in addition to entrepreneurship centres in Iran.

Second, we examined only the moderating effects of two cultural values, namely individualism and collectivism. Uncertainty avoidance and power distance at the level of the individual should certainly be studied for possible incorporation into models of entrepreneurial intentions in the future (Siu & Lo, 2011). The literature suggests that these two cultural values may moderate the relationship between motivational variables and EI (Mitchell et al., 2000; Liñán & Chen, 2009). The literature suggests that the cultural value orientations proposed by Schwartz (1999) can also influence entrepreneurship (Liñán, Fernández-Serrano, & Romero 2013). Future research should thus investigate the effects of these values within a cognitive model of entrepreneurial intention as well.

Third, the present study was cross-sectional, which means that changes in entrepreneurial attitudes and intentions over time could not be traced. Longitudinal study is therefore recommended in the future to map any changes in the entrepreneurial attitudes and intentions of students and their subsequent behaviour.

Fourth, we only assessed the role of individual differences in cultural values for a single culture with its own unique mix of individualism and collectivism. Future research should examine the role of individual differences in cultural values in, for example, more individualist cultures. It can be asked if the individual-level effects are stronger or weaker in a society which is more individualist than Iran but also in more collectivist non-Western cultures such as China, Japan and other Muslim countries such as Turkey and Egypt.

Finally, culture is greatly influenced by religion because religion determines the individual's basic values and beliefs (Basu & Altinay, 2002). Dodd and Seaman (1998) have argued that religion may have an even more pervasive influence on environmental factors and thus influence the decision to become an entrepreneur within a particular society than typically assumed. Given that the majority of Iranians are religious and religion plays a clearly apparent role in Iranian society, future studies should also investigate the impact of religion on EI and entrepreneurial behaviour.

# Chapter 3

## The Influence of Gender and Role Models on Entrepreneurial Intentions

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### Abstract

Drawing on the Theory of Planned Behaviour (TPB), the present study explores the effects of entrepreneurial role models on entrepreneurial intention and its antecedents and examines the question of whether the effects vary by gender. Data was collected from a sample of 331 students at seven universities in Iran. Structural equation modelling and bootstrap procedure were used to analyse the data. Consistent with the TPB, our results show entrepreneurial role models to indirectly influence entrepreneurial intentions via the antecedents of intention. No gender differences in the relationship between perceived behaviour control and entrepreneurial intentions was found, but gender did moderate the other relationships within the TPB. Attitude towards entrepreneurship was a weaker predictor and subjective norms a stronger predictor of entrepreneurial intentions for female students than for their male counterparts. Furthermore, perceived behaviour control and attitudes towards entrepreneurship were more strongly influenced by role models for females as opposed to male students. The results of this study have clear implications for both educators and policy makers.

### 3.1 Introduction

Entrepreneurship is increasingly recognized as an important driver of productivity, innovation, job creation, and both economic and social development (Audretsch, 2012; Shane & Venkataraman, 2000; Parker, 2009; Wennekers et al., 2005). Given these positive effects of entrepreneurship, many developing countries — including Iran — have examined entrepreneurship as a fundamental solution for such problems as lack of economic improvement, increasing unemployment rates, an excessive number of college graduates and an inability of both the public and private sectors to provide sufficient work for graduating students (Karimi et al., 2010). While entrepreneurship has been viewed as crucial to economic growth and progress in developing countries, surprisingly little attention has been paid during the past decade of research to factors which influence the intention of individual to start new businesses and particularly the entrepreneurial intentions of those still within the education system (Karimi et al., 2010). It is obviously crucial that those factors which influence the entrepreneurial intentions and behaviour of college students be adequately understood in order to develop and implement effective strategies to stimulate these. Stated differently, identification of a suitable theoretical framework and sufficient understanding of the determinants of entrepreneurial intentions and behaviour can help entrepreneurial educators, consultants, advisors and policy makers to foster entrepreneurship starting at universities and within society as a whole.

Entrepreneurship researchers have adopted intentional models of social cognition to identify the key cognitive determinants of entrepreneurial intention and behaviour (e.g., Kolvereid, 1996a; Krueger & Carsrud, 1993). One particularly well-researched model used within



this context is the Theory of Planned Behaviour (TPB) as originally presented by Ajzen (1988, 1991). The TPB postulates that intention is the most important determinant of behaviour but itself influenced by attitudes towards behaviour, subjective norms and perceived behavioural control (PBC). In a meta-analytic review of the results of 185 empirical studies addressing the TPB in one way or another, Armitage and Conner (2001) concluded that the TPB can indeed be used to effectively predict both intention and behaviour. With regard to entrepreneurship, the efficacy and ability of the TPB to predict entrepreneurial intentions (EI) has been demonstrated in a number of studies (e.g., Karimi et al., forthcoming, b; Kolvereid, 1996a; Krueger et al., 2000; Linan & Chen, 2009). These studies suggest that attitudes towards behaviour, subjective norms and PBC typically explain 30% to 50% of the variance in intention, which means that about half of the variance in EI remains unexplained. The associations between cognitive determinants and EI have also been found to vary across contexts and from situation to situation, moreover.

The unexplained variance found for behavioral intentions is unlikely to be fully attributable to methodological factors such as measurement error (see Sutton, 1998). Researchers have therefore proposed that the exclusion of additional variables (through mediating effects) and moderating variables within the original TPB may account for the limited explanatory power of the TPB and inconsistencies found across studies (Conner & Armitage, 1998; Sutton, 1998). And within the field of entrepreneurship, several authors have called for the inclusion of additional factors (e.g., Linan et al., 2011). In mediating effects, exogenous or external variables (such as demographic variables) will influence an individual's beliefs, attitudes, and subjective norms and those factors will ultimately predict intentions (Conner & Armitage, 1998; Fishbein & Ajzen, 2010). In moderating effects, external variables may have an effect on the relative importance of beliefs, attitudes, and subjective norms (Fishbein, 1980).

According to the institutional approach (North, 1990, 2005), socio-cultural environment can be assumed to play a crucial role in the shaping of individual attitudes and economic behavior, including entrepreneurship (Lafuente et al., 2007). Fornahl (2003) further identified the presence of entrepreneurial role models as one the most important socio-cultural factors to play a role in entrepreneurship. According to Gibson (2004), who draws upon theories of social learning and role identification, role models can generally serve three interrelated functions: 'to provide learning, to provide motivation and inspiration and to help individuals define their self-concept'. Nauta and Kokaly (2001) attribute another function to role models, namely to provide support and guidance. Entrepreneurial role models are thus a promising resource for entrepreneurial learning and the inspiration of students to become entrepreneurs, but there is little agreement on the magnitude and mechanisms of their influence. Therefore, the purpose of

adding entrepreneurial role models to TPB is to examine whether and how this additional variable may influence students' decision to start a new business.

Gender is a fundamental dimension of the socio-cultural environment and can therefore be a possible determinant of EI and entrepreneurship. Despite the increasing number of female entrepreneurs (de Bruin, Brush, & Welter, 2006; Thébaud, 2010), entrepreneurship is still associated with masculine traits (Ahl, 2006; Gupta et al., 2009; Lewis, 2006) and female entrepreneurship is significantly lower than male entrepreneurship (Langowitz & Minniti, 2007). This gap is particularly noticeable in Iran where women constitute less than 10% of entrepreneurs which is lower than both the regional MENA (Middle East and North Africa) averages and the global average (Sarfaraz & Faghih, 2011). According to a survey by the World Bank, of 5169 firms in the MENA, only 13% are owned by females. At a global level, the World Bank estimates 25% to 33% of all private businesses to be owned or operated by females. Therefore, it has been suggested that the identification of ways to empower women's participation and success in entrepreneurship may be critical for successful and sustainable development across countries (Allen, 2008).

The reasons for the entrepreneurial gender gap are not yet clearly understood (Minniti & Arenius, 2003). One critical factor in the gender gap may be individual entrepreneurial perceptions, propensities and intentions (Koellinger et al., 2011). Studying gender differences in entrepreneurial intentions and behaviour might therefore help us understand the reasons for the lower entrepreneurial activity of women compared to men (Ljunggren & Kolvereid, 1996), but the majority of research on female entrepreneurship has been conducted in Western countries like the USA and UK (Ahl, 2002). Scientific knowledge of the differences in entrepreneurship according to gender is scarce in developing countries like Iran. According to McManus (2001) and Ahl (2006) the investigation of gender differences in entrepreneurship in developing countries is seen as a promising direction for new research. It is critical that gender be included as a potentially important moderator of the associations between the determinants of EI and subsequent behaviour. Doing this can afford us a better understanding of the determinants of EI but also the sources of the observed gender differences in entrepreneurship. And on the basis of this knowledge, we can develop a more favourable environment for women in the field of entrepreneurial education and activity.

Moreover, research has shown that role models are especially important for women who are pursuing non-traditional careers (Gilbert, 1985; McLure & Piel 1978; Smith & Erb, 1986; Subotnik & Steiner, 1992; Tidball, 1973) such as entrepreneurship (DeMartino and Barbato, 2003). The availability of appropriate role models in non-traditional careers can, for example, reduce stereotype threat effects (Marx & Roman, 2002). Therefore, exposing women to entrepreneurial

role models might help to decrease the gender gap in entrepreneurship. However, there is very little research on this issue (especially in developing countries), and it remains an open question as to how role models influence male and female entrepreneurial perceptions and intentions.

It should be noted that in most entrepreneurship studies, gender has been discussed from the perspective of its main effects as opposed to its moderating effects on EI. That is, the direct effects of gender on EI (e.g., Crant, 1996; Veciana et al., 2005) and indirect effects of gender on EI via predictors of intention (e.g., Kolvereid, 1996b; Zhao et al., 2005; Yordanova & Tarrazon, 2010) have been examined but not the moderating effects of gender on the relationships between EI and its determinants. Men have generally been found to have a stronger intention to start up a new business than women, but whether the specific relationships between EI and its determinants are similar for males and females is unknown.

To summarize, in the present research, we applied the TPB to predict the EI of students studying in the developing country of Iran. We added two important socio-cultural factors to the TPB— namely entrepreneurial role models and gender — to the TPB. We then examined the mediating and moderating effects of these factors. In the following, we first present the theoretical framework used in the current study and then present our hypotheses with regard to how attitudes, entrepreneurial role models and gender can be expected to influence the EI of students in a developing country like Iran. We then describe the sample and research method before presenting the results. After discussing the possible mediating and moderating effects of role models and gender on the EI of the students in our study, we finish with the research conclusions, implications for entrepreneurship education, and some directions for future studies.

## **3.2 Theoretical Framework and Hypotheses**

### **3.2.1 Theory of Planned Behaviour**

Among models of social-cognition, one of the most widely researched is Theory of Planned Behaviour (TPB) as originally presented by Ajzen (1988, 1991). This theory is one of the most influential and popular conceptual frameworks for the study of human action (Ajzen, 2002). Central to the theory is the concept of individual intention, defined as ‘a person’s readiness to perform a given behaviour’ (Ajzen, 1991). Intention to engage in a specific behaviour is assumed to precede actual engagement in the behaviour.

Within an entrepreneurial context, Thompson (2009, p. 676) defines intention as ‘a 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’. Such an entrepreneurial intention has been proven to be a primary predictor of future entrepreneurial behaviour (Krueger et al., 2000).

Consequently, the model stresses that intentions to engage in a behaviour are affected by three motivational factors or antecedents (Ajzen, 1991; Kolvereid, 1996b; Krueger et al., 2000): (1) attitudes towards behaviour or the degree to which the individual holds a positive or negative valuation of a behaviour and/or its consequences (e.g., becoming an entrepreneur); (2) subjective norms (SN) or perceptions of what family, friends and significant others might think about engagement in a specific behaviour (e.g., becoming an entrepreneur); and (3) perceived behavioural control (PBC) or the perceived ease/difficulty of performing a specific behaviour (e.g., becoming an entrepreneur). These three antecedents in turn are affected by exogenous influences such as personal and situational factors. The TPB predicts that the more favourable the attitudes towards entrepreneurial behaviour and subjective norms regarding such behaviour but also strong perceived behavioural control with regard to such, the greater the intention to engage in that behaviour.

The TPB has been used to predict the EI of students and confirmed the critical roles of attitudes towards entrepreneurship (ATE), SN and PBC in the prediction of these intentions (e.g. Karimi et al., *forthcoming*, b; Krueger et al., 2000). All three of the antecedents postulated by Ajzen (1991) have been found to be important, but their relative importance and the magnitude of their influence have been found to vary considerably across individuals, situations and countries (Fishbein & Ajzen, 2010).

### 3.2.2 Entrepreneurial Role Models

An individual's decision to engage in a particular type of behaviour is often influenced by the opinions and actions of others, the way in which others demonstrate their identities and the example provided by others (Ajzen, 1991; Akerlof & Kranton, 2000; Bosma et al., 2012). Such 'others' are often referred to as 'role models'. According to Gibson (2003, pp. 199), 'a role model is a person an individual perceives to be similar to some extent, and because of that similarity, the individual desires to emulate (or specifically avoid) aspects of that person's attributes or behaviours.'

The importance of role models in the career decision-making and choice of university students to become entrepreneurs has been widely documented (Krueger et al., 2000; Matthews and Moser 1996). Knowing successful business people provides the individual with good examples to imitate and can inspire them to become a business person themselves (Bygrave, 2004; Caputo & Dolinsky, 1998; Gibson, 2004). Successful entrepreneurial role models not only transmit positive messages regarding entrepreneurship (Gnyawali & Fogel, 1994) but can also make it easier for the individual to discover and act upon new business ideas and opportunities during the initial stages of the entrepreneurial process (Bygrave, 1995; Fornahl, 2003). In addition, the observation of and

interaction with entrepreneurial role models encourages learning and provides opportunities to gain insight into entrepreneurial tasks and skills. According to social learning theories, people pay attention to role models because such observation can help them perform new tasks, learn new skills, acquire norms and make sense of the environment (Bandura, 1986). Furthermore, entrepreneurial role models provide information which can reduce the ambiguity associated with starting a business (Minniti & Nardone, 2007). Entrepreneurial role models are thus an important source of social capital (Bosma, et al., 2012), but little is known about the exact mechanisms via which entrepreneurial role models influence the EI of students. And Busenitz and Barney (1997) have therefore suggested that the direct and indirect effects of role models on the decision to start a business should be explored.

In the available research literature, two hypotheses about the relationship between role models and career choices are discussed (Quimby & DeSantis, 2006). The first hypothesis draws upon Social Cognitive Career Theory (Lent et al., 1994) and asserts that role models provide contextual support which can directly affect the career decision-making process. Studies show that the presence of role models within the family, relatives or friends can strongly influence the entrepreneurial intentions and activities of students (BarNir et al., 2011; Carr & Sequeira, 2007; Carsrud, Olm, & Eddy, 1987; Chlosta et al., 2012; Davidsson & Honig, 2003; de Clercq & Arenius, 2006; Kirkwood, 2007; Matthews & Moser, 1996; Mueller, 2006; Pruett et al., 2009; van Auken et al., 2006). The availability of role models can increase the desire to become an entrepreneur via legitimization, advice, professional and personal feedback, insight and encouragement to turn entrepreneurial ambitions into actual reality (Arenius & de Clercq, 2005; BarNir et al., 2011; Koellinger et al., 2007; Mueller, 2006). And on the basis of this information, we hypothesized the following:

**H1:** *Knowing a role model will be positively associated with an EI.*

Although numerous studies have provided support for a direct, positive association between having an entrepreneurial role model and a positive entrepreneurial career choice (BarNir et al., 2011; Chlosta et al., 2012; van Auken et al., 2006), others have failed to find such an association (e.g., Carsrud, Gaglio, & Olm, 1987; Franco et al., 2010). Additional intervening variables may thus be at work or current conceptualizations of the relationship between entrepreneurial role models and career decisions may be deficient or somehow limited (BarNir et al., 2011). And for this reason, a second hypothesis regarding the relationship between role models and an entrepreneurial career choice has been put forth in the literature. According to social cognitive theory (Bandura, 1986) and some empirical studies based on TPB (e.g. Kolvereid, 1996b; Krueger, 1993; Krueger & Carsrud, 1993), role models, as the exogenous influence, can indirectly influence career intentions via the antecedents of behavioural intention. Scherer et al.

(1989), Krueger (1993), Krueger and Carsrud (1993) and Krueger et al. (2000) argue that role models can affect EI, but only if they affect the individual's attitudes towards entrepreneurship and perceived ability to undertake a new venture with success. Kolvereid (1996b) has also argued that role models (i.e., family background) can indirectly influence EI via their effect on the antecedents of career intentions namely: ATE, SN and PCB. Walter and Dohse, (2009) reported role models to affect all three of the antecedents to EI, as suggested by the TPB. And the results of a study by Carr and Sequeira (2007) showed significant direct effects of prior exposure to a family business on EI but also significant indirect effects via the mediating variables of ATE, SN and PBC.

Social learning theory or social cognitive theory (Bandura, 1986) suggests that role models provide vicarious learning experiences which can increase self-efficacy and thereby strengthen particular interests and choices of action with regard to various fields of education and career. By watching another person succeed, one's own self-efficacy judgments can be elevated (Scherer et al., 1989). Social learning theory further asserts that role models can directly affect self-efficacy and indirectly affect career decisions by providing both financial and non-financial support and guidance but also opportunities to perform new tasks and develop new abilities in addition to mastering other useful business-related knowledge. Modelling can offer opportunities to learn how to deal with challenges and manage risks that will increase an individual's belief in their self-efficacy (Zhao et al., 2005). This is supported by Wood and Bandura's (1989) observation that role models build self-beliefs of capability by conveying to observers effective strategies for managing different situations. And according to Carsrud et al. (2007), entrepreneurial role models heighten PBC by strengthening the individual's perceptions of their ability to master challenges related to an entrepreneurial career.

In keeping with Bandura (1986), via the observation of role models, an individual can learn vicariously and thereby increase their self-efficacy. Observers can attempt to replicate the behaviour of role models, which can positively affect their self-efficacy. Role models can also enhance an individual's self-efficacy via persuasion, encouragement and feedback with regard to certain types of entrepreneurial behaviour (Bandura, 1986; Cox et al., 2002). Entrepreneurial role models have been shown to positively influence the entrepreneurial self-efficacy or PBC of individuals (BarNir et al., 2011; Scherer et al., 1989). And Zellweger et al. (2011) has shown role models and particularly parental role models to positively contribute to an inclination to undertake an entrepreneurial career by enhancing PBC. In line with Bandura (1997), thus, role models can be expected to influence PBC which will mediate the effect of role models on EI.

ATE can be influenced by many exogenous variables, including role models. Exposure to entrepreneurial role models can show students the potential personal, professional and societal

outcomes associated with an entrepreneurial career. The attractiveness and desirability of a career as an entrepreneur and thus ATE may thus be influenced by role models. Furthermore, early socialization in a family business can contribute to the formation of positive entrepreneurial values and perceptions (Carr & Sequeira, 2007; Light & Bonacich, 1988). According to the Theory of Career Choice (Dick and Rallis, 1991), student beliefs regarding a specific career are influenced by not only prior exposure to a particular career but also what they have perceived to be the attitudes and expectations of key socializers (e.g., parents, friends and teachers) regarding that career. Prior exposure and perceptions can thus influence the attitudes of students towards particular careers and ultimately their career choices. In particular, when individuals see important others positively evaluate entrepreneurship, they will be inclined to have more positive ATE as well (Carr & Sequeira, 2007).

In addition, the entrepreneurial spirit projected by an entrepreneurial role model can set the terms of support or pressure for the start of a new business and thus create a greater SN. In a study of a large group of Norwegian students and employees, for example, Reitan (1997) found having an entrepreneurial role model to positively influence subjective norms with regard to being an entrepreneur.

On the basis of the preceding information, we have thus hypothesized the following:

**H2:** ATE will mediate the relationship between knowing a role model and EI.

**H3:** SN will mediate the relationship between knowing a role model and EI.

**H4:** PBC will mediate the relationship between knowing a role model and EI.

### 3.2.3 Gender

As already mentioned, the proportion of entrepreneurs who are female is significantly lower than the proportion of entrepreneurs who are male (Langowitz & Minniti, 2007). According to empirical study, males are also generally more interested in an entrepreneurial career than females (Blanchflower et al., 2001; Grilo & Irigoyen, 2006), males have a higher desire and intention to start their own business than females (Crant, 1996; Minniti & Nardone, 2007; Wilson et al., 2004, 2009; Zhao et al., 2005) and males are more likely to succeed when they start a new business than females (Boden & Nucci, 2000; Carter et al., 1997; Robb, 2002). These differences in the entrepreneurial attitudes, values and behaviour of men versus women can be attributed to differences in their social orientations and behavioural motives. Based on these findings and such theories as Bem's (1981) gender schema theory, Eagly's social role theory (1987) and the social dominance theory of Sidanius and Pratto (1999) plus other empirical findings (e.g., Gefen & Straub, 1997) and the results of meta-analyses (e.g., Eagly & Wood, 1991; Franke, et. al., 1997), male students can be expected to be more agentic (i.e., assertive, independent, autonomous,

courageous, dominating, instrumental and task-oriented) than female students. They can also be expected to rely more than female students on their own intuitions in the development of their entrepreneurial intentions while female students can be expected to be more communal (i.e., affiliative, expressive, submissive, supportive, kind and nurturing). Female students can also be expected to rely less on their own judgments and accept the opinions of their families and other significant people when contemplating the start of a new business.

Men and women also differ in terms of self-construal with women are more likely to demonstrate an interdependent construal of themselves than men (Cross & Madson, 1997; Garbarino et al., 1995; Kashima et al., 1995). Women define themselves more in relation to others than men (Markus & Kitayama, 1991). Men are similarly more often described as autonomous and acting independent of others than women (Williams and Best, 1990). And within a particular social system, women usually place more value on interpersonal goals and their achievement, harmonious relationships and smooth communication than men do (Gilligan, 1982; Gill et al., 1987; Konrad et al., 2000; Williams & Best, 1990). Hofstede's (1980) seminal work on culture also shows men to rate extrinsic motivators (e.g., potential for advancement, increased earning power) as more important than women. Moreover, subjective norms are related to self-confidence in that less confident people have been shown to depend more on the opinions of others (Dong and Zhang, 2011) and, with regard to entrepreneurship, women have been shown to have significantly lower levels of confidence in their entrepreneurial abilities than men (Chen et al., 1998; Wilson et al., 2007). All of this suggests that subjective norms may play a more important role in the EI of females than in the EI of male students.

Based on the TPB, subjective norms and the perceived social pressure which these reflect can be expected to be more important for the prediction of the behavioural intentions of women as opposed to men while individual attitudes towards entrepreneurship and the instrumental motives which these reflect can be expected to be more important for the prediction of the behavioural intentions of men as opposed to women.

Accordingly, we develop the following hypotheses:

**H5:** *Gender will moderate the relationship between ATE and EI such that the relationship is stronger for male students than for female students.*

**H6:** *Gender will moderate the effect of SN on EI such that the relationship is stronger for female students than for male students.*

Previous evidence suggests that women are more likely than men to limit their career aspirations and interests because they think that they lack the necessary capabilities and skills (Bandura, 1992). This has been found to particularly be the case for careers which are seen as traditionally 'male' and thus for entrepreneurship (Thébaud, 2010). Female students have been



shown to have less confidence in their business abilities than male students (Chen et al., 1998; Chowdhury & Endres, 2005; Díaz-García & Jiménez-Moreno, 2010; Wilson et al., 2007; Yordanova & Tarrazon, 2010), but moderating effects of gender on the relationship between self-efficacy and EI have not been reported. Moreover, women focus more on perceived skill deficiencies than men within the realm of entrepreneurship (Bandura et al., 2001). Given the agentic nature of entrepreneurship, moreover, women perceive their environment to be less supportive and less rewarding of entrepreneurial activity than men do (Zhao et al., 2005) and they have a lower sense of personal control over many of the activities associated with an entrepreneurial career than men (BarNir et al., 2011). The results of a large study showed women to perceive themselves and the entrepreneurial environment less favourably than men (Langowitz & Minniti, 2007).

As already mentioned, instrumentality (i.e., expected outcome) is more important for men than for women. This higher valuation of instrumentality can in turn be expected to affect PBC (Venkatesh et al., 2000). Given high instrumentality (i.e., positive expected outcomes), men are more likely to invest the effort needed to overcome constraints and difficulties to achieve their goals and less like to consider the magnitude of effort involved (Venkatesh et al., 2000). In contrast, women are inclined to be more process-oriented and therefore focus on the magnitude of the effort involved to realize their goals and the nature of the processes (Hennig & Jardim, 1977; Rotter and Portugal, 1969). Given the process-orientation of women and the generally lower level of confidence in their entrepreneurial abilities (see Chowdhury & Endres, 2005; Wilson et al., 2007), the perceived ease or difficulty of starting up a new business is expected to influence their EI in important ways. And on the basis of this information, we hypothesized the following:

**H7:** *Gender will moderate the relationship between PBC and EI such that the relationship is stronger for female students than for male students.*

Although males may generally be more interested in starting a business than females (Blanchflower et al., 2001; Grilo & Irigoyen, 2006), the presence of role models can alter the relationship between gender and EI (Matthews and Moser, 1996). The question, however, is whether this occurs similarly for males and females? Research suggests that socio-cultural factors may have a greater impact for female entrepreneurship than for male entrepreneurship (Jennings & McDougald 2007). That is, role models may have a greater influence on the perceptions of entrepreneurship for females than for males. As already pointed out, women are more open and receptive to social influences — including the opinions of important others — than men. They also tend to focus on the interpersonal aspects of relationships more than men. As a result, we can expect entrepreneurial role models to influence the perceptual antecedents — including ATE, SN and PBC — more among women than among men.

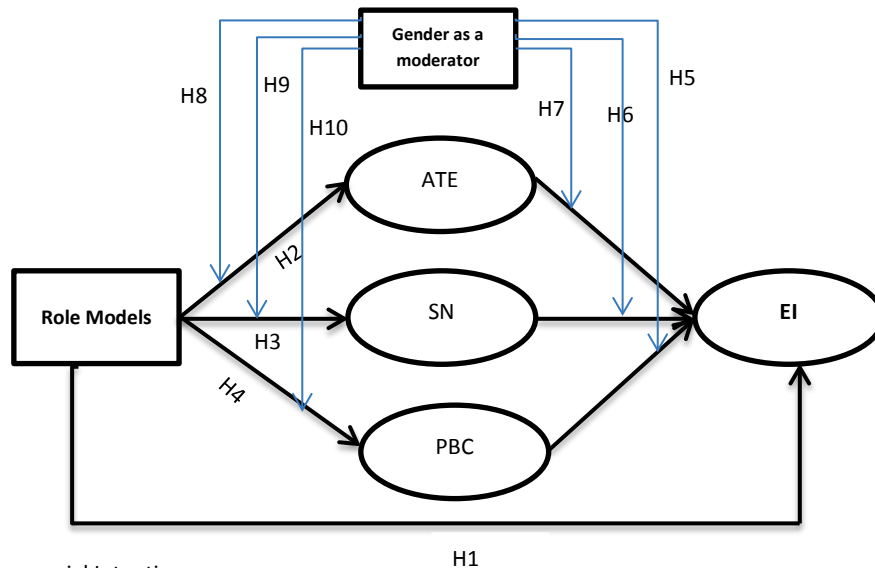
Also as previously noted, individuals who perceive important others to positively evaluate business ownership will tend to positively perceive business ownership as well (Carr & Sequeira, 2007). Given that women are inclined to value the opinions of important others and thus role models more than men, we therefore expected that entrepreneurial role models to enhance the attractiveness and desirability of entrepreneurship more for female students than for male students. We also expected entrepreneurial role models to increase the perceived support to start a new business more for female students than for male students.

**H8:** *Gender will moderate the effect of role models on ATE such that the relationship is stronger for female students than for male students.*

**H9:** *Gender will moderate the effect of role models on SN such that the relationship is stronger for female students than for male students.*

As already mentioned, role models can vicariously enhance self-efficacy or PBC. However, some studies have shown these effects to be moderated by gender such that role models exert a stronger positive effect on the entrepreneurial self-efficacy of women than of men (BarNir et al., 2011). In keeping with this, we therefore expected the effects of role models to lead to greater changes in the PBC of females as opposed to males. Not only is the entrepreneurial knowledge gap greater for female entrepreneurs to start with, women have also been shown to be more responsive than men to information and feedback provided by others (Roberts, 1991). Furthermore, women are more likely than men to be pick up on the interpersonal and behavioural cues which are important for learning and internalizing lessons from role models due in part to their traditional social roles, better relational abilities and superior communal skills (Kiecker, Palan, & Areni, 2000; Meyers-Levyand & Sternthal, 1991). On the basis of this information, we therefore hypothesized the following:

**H10:** *Gender will moderate the effect of role models on PBC such that the relationship is stronger for female students than for male students.*



EI= Entrepreneurial Intentions  
 ATE= Attitudes toward Entrepreneurship  
 SN= Subjective Norms  
 PBC= Perceived Behavioral Control  
 H= Hypothesis  
 Arrows represent hypothesized paths

**Figure 3.1** The hypothesized model linking gender, role models, antecedents to intention, and entrepreneurial intentions

### 3.3 Research Method

#### 3.3.1 Sample and procedure

In our study, 400 Bachelor of Science (BSc) and Master of Science (MSc) students who had participated in entrepreneurship courses in seven Iranian universities during the academic year of 2010-2011 were targeted. This is a convenience sample as frequently used in entrepreneurship research (de Jorge et al., 2012; Karimi et al., *forthcoming*, b; Krueger et al., 2000, Liñán et al., 2011). These students were targeted on the basis of the assumption that they would be more likely to start a business (Hornaday and Vesper, 1982) and, because they were in their last years of college, it was assumed that they would have fairly clear vision of their plans for the future and imminent career decisions (Krueger et al., 2000).

A questionnaire was distributed during a session of the course, and the students were given 30 minutes to complete it. The students were given a small gift for completion of the questionnaire. A total of 346 questionnaires were returned, representing a response rate of 87%. When the questionnaires were subsequently screened for missing data and outliers (Hair et al., 2010), 331 useful questionnaires were obtained. Out of a total of 204 female students, 104 had entrepreneurial role models among their circle of family, relatives and friends (51%); 59 of the 204 female students had entrepreneurial parents (28.9%). Out of a total of 127 male students, 69

had entrepreneurial role models among their family, relatives and friends (54.3%); 30 of the 127 male students had entrepreneurial parents (23.62%). The other demographic characteristics of the sample are presented in Table 3.1.

**Table 3.1** Sample characteristics

Demographic variable	Values	
Age	Mean: 22.46	
Gender	Male: 127 (38.4%)	Female: 204 (61.6)
Level of education	BSc: 255 (77%)	MSc: 76 (23%)
Academic major	Business: 76 (23%)	Non-business: 255 (77%)

### 3.3.2 Measures

Aside from the presence of role models and the demographic characteristics of the students participating in our study (see description of Control Variables), all of the variables were measured using a seven-point Likert rating scale which ranged from '1' representing 'strongly disagree' to '7' representing 'strongly agree'. All of the questionnaire items were adapted from existing scales. The items and sources from which the items are derived are summarized in Table 3.2.

To determine the presence of entrepreneurial role models among the circle of family, relatives and friends, the students were asked two questions: 'Did your parents ever start a business?' and 'Do you personally know any successful entrepreneurs among your relatives/friends/others?' Research suggests that entrepreneurial role models tend to be close (such as parents and friends) as opposed to remote 'icons' (Bosma et al., 2012), and the effect of having an entrepreneurial role model was therefore expected to be relatively greater when the role model was closely tied to the respondent (Davidsson, 2004).

Following Schmitt-Rodermund et al. (2011), the response to the first question regarding the presence of entrepreneurial role models was coded as 0 = 'no' or 2 = 'yes'. The response to the second question was coded along a three-point scale: 0 = no one, 1 = some and 2 = many. The modelling measure could thus range from 0 (= no role models) to 4 (= parental role model plus relatives and/or friends as role models). This coding procedure thus indicates the proximity of role models (Gibson, 2004, Schmitt-Rodermund et al., 2011).

### 3.3.3 Control Variables

To minimize the spuriousness of the results, we included four control variables in the study. Age, level of education (coded as 0 = BSc or 1 = MSc), academic major (coded as 0=non-business and

1=business), and university ranking (coded as 3 = high ranking, 2 = intermediate ranking and 1 = low ranking).

**Table 3.2** List of constructs

Construct	Research reference	No of items
<b>Entrepreneurial Intentions</b>	Linan and Chen (2009) , e.g., 'I have very seriously thought of starting a firm'	6
<b>Attitude toward Entrepreneurship</b>	Linan and Chen (2009), e.g., 'Being an entrepreneur implies more advantages than disadvantages to me'.	5
<b>Subjective Norm</b>	Adopted from Kolvereid (1996b), which has been used in Kolvereid and Isakson (2006) and Krueger et al. (2000). This scale included two separate questions: belief (e.g., 'I believe that my closest family thinks that I should start my own business') and motivation to comply (e.g., 'I care about my closest family's opinion with regard to me starting my own business'). The belief items were recoded into a bipolar scale (from -3 to +3) and multiplied with the respective motivation-to-comply items. The subjective norm variable was calculated by adding the three results and dividing the total score by three.	6
<b>Perceived behavioral control</b>	Linan and Chen (2009); e.g., 'Starting a firm and keeping it viable would be easy for me.'	6
<b>Entrepreneurial role models</b>	Krueger (1993), e.g., 'Did your parents ever start a business?'	2

### 3.3.4 Statistical analyses

The data was analysed using SPSS18 and AMOS18. An Exploratory Factor Analysis (EFA) was first conducted on the responses to the questionnaire items. Structural Equation Modelling (SEM) was then undertaken to test for the hypothesized mediation and moderation effects. Finally, the so-called bootstrap method used to determine the significance of the SEM mediation effects as recommended by previous researchers (Cheung and Lau, 2008; Preacher and Hayes, 2008).

## 3.4 Results

### 3.4.1 Exploratory factor analysis

The results of the Exploratory Factor Analysis (EFA) called for the elimination of one item related to EI, one item related to ATE and one item related to PBC due to factor loadings which were either below 0.5 or cross loadings which were greater than 0.4. A new EFA was then performed on the remaining 17 items. All of the factor loadings were now acceptable (>0.5), which provides

support for the validity of the questionnaire. Furthermore, a high KMO measure of sampling adequacy (KMO = 0.871, which is above the required minimum of 0.60) and a highly significant Bartlett test of sphericity (chi-square: 2642.461; significance:  $p < 0.00$ ) showed the sample and data to be suitable and adequate for the conduct of an EFA (Field, 2009).

### 3.4.2 Structural equation modelling

According to Hair et al. (2010) and Kline (2005), it is appropriate to adopt a two-step approach for SEM: first assess the measurement model; then assess the proposed structural model.

#### 3.4.2.1 Assessment of measurement model

A Confirmatory Factor Analysis (CFA) was conducted to determine the Goodness of Fit indices, reliability and validity of the proposed measurement model. The CFA indicated that although the chi-square statistic was significant ( $X^2 = 202.165$ ;  $P < 0.01$ ), which is common with large sample sizes, the measurement model nevertheless provided a reasonable fit for the data ( $X^2/df = 1.671$ ; GFI=0.936; TLI=0.961; CFI=0.970; IFI= 0.970; RMSEA= 0.045). It was therefore decided that the hypothesized model with five core constructs provided a suitable model for the analyses in this study (Table 3.3).

**Table 3.3** Summary of goodness of fit indices for the measurement model

Fit indices	$X^2$	P	$X^2/df$	GFI	CFI	TLI	IFI	RMSEA
Value	202.165	.000	1.671	.936	.970	.961	.970	.045
Suggest value		>0.05	<3	>0.80	>0.90	>0.90	>0.90	<0.07

The convergent and discriminant validities of the core constructs can be assessed by referring to the measurement model. Convergent validity refers to the extent to which indicators of a construct converge or share a high proportion of variance in common (Hair et al., 2010). According to Fornell and Larcker (1981), convergent validity can be determined for a measurement model on the basis of three criteria: (1) all factor loadings should be significant and higher than 0.50 (Janssen et al., 2008); (2) the scale composite or construct reliability should exceed 0.70 according to Nunnally and Bernstein (1994); and (3) the average variance extracted (AVE) for each construct should be 0.5 or above (Hair et al., 2010).

Table 3.4 shows the critical ratio (CR= t) value to exceed 8.160 ( $p < 0.01$ ) for all times and all of the factor loadings to be more than 0.5, which indicates good convergent validity. Furthermore, all of the items were loaded significantly on their specified constructs ( $p < 0.01$ ). These results provide evidence for the unidimensionality of each construct. The construct

reliability ranged from 0.73 to 0.87 for all of the constructs, which is higher than the recommended level of 0.70. And the results showed the AVE to be above the recommended threshold of 0.50 for all of the constructs as well (Fornell & Larcker, 1981). In sum, all of the constructs in the measurement model showed sufficient reliability and convergent validity.

Discriminant validity indicates the extent to which one construct truly differs from another construct (Hair et al., 2010). According to Fornell and Larcker (1981), if the square root of the AVE estimate for each construct is greater than the correlation between that construct and all other constructs in the model, then discriminant validity is demonstrated. As can be seen from Table 3.5, the square root of the AVE ranged from 0.69 to 0.75, which is greater than the correlations between the five constructs which ranged from 0.10 to 0.58. This means that the indicators have more in common with the target construct than with the other constructs in the measurement model (Fornell & Larcker, 1981) and that the model has been found to have sufficient discriminant validity.

We also examined the so-called nomological validity of the data or the extent to which the correlations between the constructs in the measurement model make sense (Hair et al., 2010). These correlations between the constructs are examined for this purpose (Steenkamp & van Trijp, 1991). All five of the constructs in the measurement model correlated significantly with each other, which shows sufficient nomological validity for the measurement model (Table 3.5).

Finally, the alpha coefficients were calculated to determine the reliability (i.e., internal consistency) of the five constructs in the measurement model. All of the constructs had reliability values which were greater than the required threshold of 0.70 with a range of 0.75 to 0.93 (see Table 3.5). The measurement scales of the constructs were thus stable and consistent (Hair et al., 2010).

**Table 3.4** Results of confirmatory factor analysis for the hypothesized model

Latent variable	Items	Standardized Factor Loading	T-value (critical ratio)	Construct Reliability	AVE
<b>Entrepreneurial intention</b>	Y1: I'm ready to do anything to be an entrepreneur.	.55		.90	.51
	Y2: My professional goal is becoming an entrepreneur.	.68	10.272		
	Y3: I will make every effort to start and run my own business.	.84	9.093		
	Y4: I'm determined to create a firm in the future.	.80	9.008		
	Y5: I have very seriously thought about starting a business.	.68	8.666		
<b>Attitudes toward entrepreneurship</b>	X1: A career as an entrepreneur is totally attractive to me.	.78		.88	.53
	X2: Amongst various options, I would rather be anything but an entrepreneur.	.85	13.550		
	X3: Being an entrepreneur would give me great satisfaction.	.70	11.919		
	X4: Being an entrepreneur implies more advantages than disadvantages to me.	.53	9.315		
<b>Subjective norms</b>	X5: Closest family (recoded belief* motivation)	.70		.86	.54
	X6: Closest friends (recoded belief* motivation)	.66	10.060		
	X7: Important others (belief* recoded motivation)	.84	10.510		
<b>Perceived behavioural control</b>	X8: Starting a firm and keeping it viable would be easy for me.	.69		.92	.56
	X9: I believe I would be completely able to start a business.	.87	15.939		
	X10: I am able to control the creation process of a new business.	.79	12.289		
	X11: If I tried to start a business, I would have a high chance of being successful.	.68	10.828		
	X12: I know all about the practical details needed to start a business.	.70	12.167		

\*\*p &lt; 0.01

**Table 3.5** Correlations and square roots of AVE estimates in bold on the diagonal for all constructs

Variable	Cronbach's alpha	Full Sample		Male		Female		1	2	3	4
		M	SD	M	SD	M	SD				
1-Entrepreneurial intention	.84	4.97	1.38	5.03	1.24	4.93	1.48	<b>(.73<sup>a</sup>)</b>			
2- Attitudes toward entrepreneurship	.80	5.35	.87	5.34	.79	5.36	.92	.43**	<b>(.73)</b>		
3- Subjective norms	.78	3.07	5.84	2.34	5.30	3.53	6.13	.33**	.18**	<b>(.74)</b>	
4- Perceived behavioural control	.88	4.38	1.34	4.39	1.30	4.38	1.37	.62**	.26**	.27**	<b>(.75)</b>
5- Role model		1.07	1.33	.94	1.18	1.30	1.52	.15*	.11*	.12*	.23**

\* Correlation is significant at the 0.05 level (2-tailed).

\*\* Correlation is significant at the 0.01 level (2-tailed).

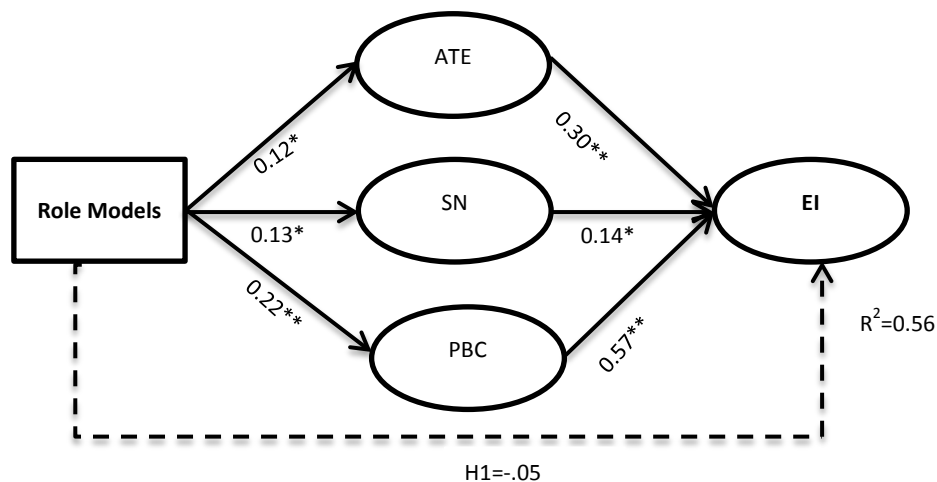
<sup>a</sup> The square root of AVE estimate in bold on the diagonal

### 3.4.2.2 Assessment of Structural Model

Once a satisfactory measurement model was obtained, SEM could be undertaken to test the model containing the hypothesized relations derived from the research literature and depicted in Figure 3.1.



As shown in Figure 3.2, the overall goodness of fit statistics show the structural model to fit the data quite well ( $\chi^2=251.898$ ;  $\chi^2/df=2.031$ ;  $GFI=0.920$ ;  $TLI=0.941$ ;  $CFI=.952$ ;  $IFI=.952$ ;  $RMSEA=.056$ ). Having assessed the fit indices for the measurement model and the structural model, the estimated coefficients for the causal relationships between the constructs in the model were examined next. As can be seen from Figure 3.2, the first hypothesis is not supported, namely that having a role model will have a directly positive effect on the EI of students; this was not found to be the case ( $H1: \beta=-0.05$ ,  $CR=1.26$ ,  $p= 0.26$ ). Overall, the hypothesized model explained 56% of the variance in the EI of the students ( $R^2= 0.56$ ).

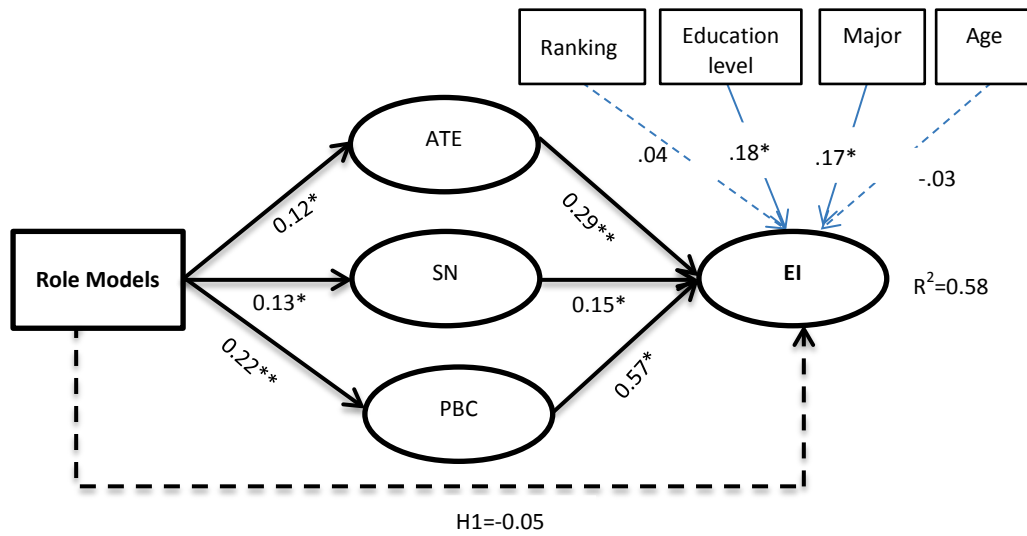


\* $p < .05$ , \*\* $p < .01$

The goodness of fit indices:  $\chi^2=251.898$ ;  $\chi^2/df=2.031$ ;  $GFI=0.920$ ;  $TLI=0.941$ ;  $CFI=.952$ ;  $IFI=.952$ ;  $RMSEA=.056$

**Figure 3.2** Path model estimates for the hypothesized model

To control for any effects stemming from student age, level of education, academic major and university ranking, these variables were added to the structural model as control variables. Figure 3.3 shows the path between university ranking and EI ( $\beta = 0.04$ ) and the path between age and EI ( $\beta = -0.03$ ) to not be significant. The path between level of education and EI ( $\beta = 0.18$ ) and the path between academic major and EI ( $\beta = 0.17$ ) were significant, which shows these control variables to influence the EI of the students to some extent; the magnitude of their effects were small, however, and did not considerably change the SEM results.



\*p < .05, \*\*p < .01

The goodness of fit indices:  $\chi^2=336.960$ ;  $\chi^2/df=1.925$ ; GFI=.912; TLI=.936; CFI=.947; IFI=.947; RMSEA=.053

**Figure 3.3** Path model estimates for the hypothesized model with control variables added

### 3.4.3 Mediation Effects

The statistical significance test for the mediation effects is the bias-corrected confidence interval (95%) through the bootstrapping procedures on 1000 samples (Shrout & Bolger, 2002). The two-tailed significance for the confidence intervals (CIs) provides a test of the standardized estimates for the indirect, direct and total effects (MacKinnon, Lockwood, & Williams, 2004; Preacher & Hayes, 2008). When the range of the bias-corrected confidence interval does not include a value of zero, one can conclude that the total indirect effect through the three mediators is significantly different from zero and that mediation is present.

The results showed role models to be positively associated with all of the mediators (ATE,  $\beta=.12$ ,  $p < .05$ ; SN,  $\beta=.13$ ,  $p < .05$ ; PBC,  $\beta=.22$ ,  $p < .01$ ) and the mediators to in turn exhibit significant relationships with the EI of the students (ATE,  $\beta=.30$ ,  $p < .01$ ; SN,  $\beta=.15$ ,  $p < .05$ ; PBC,  $\beta=.57$ ,  $p < .01$ ). In addition, the bootstrapping estimate showed a significant indirect effect of role models on EI ( $\beta=0.20$ , 95% CI= 0.11 to 0.30) while the direct effect of role models on EI — as also reported above — was not significant (H1). This suggests that ATE, SN and PBC *fully* mediate the relationship between role models and EI; support is thus found for full mediation (Table 3.6).

**Table 3.6** Direct, indirect and total effects on entrepreneurial intentions in the hypothesized model and associated bootstrapping bias-corrected 95% Confidence Intervals (CI)

Outcome	Determinant	Standardized estimates		
		Direct (95% CI)	Indirect (95% CI)	Total
EI	ATE	.30 (.15 – .44)**		.30**
	SN	.15(.02 – .30)*		.15*
	PBC	.57 (.55 – .77)**		.57**
	Role models	.05 (-.15- .04)	.20 (.11 - .30)**	.25**
ATE	Role models	.12 (.01 – .22)*		.12*
SN	Role models	.13 (.01 – .26)*		.13*
PBC	Role models	.22 (.11- .32)**		.22**

\*p &lt; .05, \*\*p &lt; .01

Whilst the demonstration of a mediation effect is important for understanding the causality between the independent and dependent variables in this study and the mechanisms which determine EI, the estimates of the specific indirect effects of the multiple mediators are of even greater interest. The AMOS program does not compute bootstrap confidence for specific mediation effects, so we therefore turned to the Preacher and Hayes (2008) SPSS macro to calculate the specific indirect effects of role models on EI via ATE, SN and PBC. Age, level of education, academic major and university ranking were entered as control variables. Once again, the results showed the indirect effect of entrepreneurial role models on EI to be fully mediated by ATE (B=0.03, 95% CI= 0.01 to 0.07), SN (B=0.02, 95% CI= 0.01 to 0.05) and PBC (B=0.13, 95% CI= 0.07 to 0.19). Hypotheses 2, 3 and 4 are thus supported by the present data.

#### 3.4.4 Moderation Effects of Gender

In this study, a two-group SEM analysis was used to evaluate the possible moderation effects of gender: males and females were analysed separately. The male group consisted of 127 respondents; the female group of 204 respondents. A two-group AMOS model was then used to decide if significant differences occurred in the structural parameters for the male versus female groups. The same SEM model as shown in Figure 3.2 was evaluated for each of the groups.

In the first step, all the path coefficients in the model were constrained to be equal across the two groups. In the second step, the path coefficients were not constrained across the two groups. In the third step, the free models and the constrained models were compared using the  $\chi^2$  difference test. If the chi-square proved significant and thus indicated a difference between the models for the male versus female groups, then the differences for each of the path coefficients were analysed in a fourth step. Thus, the criterion of establishing a moderating effect is given by these conditions: If the  $\Delta\chi^2 > CR$ , (CR- t value at  $\alpha = 0.05$ ), then the moderating variable has statistical significance in the baseline model. Hence, moderating effect is established. Otherwise, the moderating variable has no statistical significance in the baseline model if the  $\Delta\chi^2 < CR$ , at  $\alpha =$

0.05 (Byrne 2010). Table 3.7 shows the fit indices for the constrained and free models. As it can be seen, both models fit the data adequately for subsequent moderating tests.

For the two groups, the fully constrained model provided a Chi Square value of 445.876 (d.f.=269,  $p < 0.00$ ). The free model provided a Chi Square value of 405.870 (df=250,  $p < 0.00$ ). The Chi Square difference ( $\Delta\chi^2 = 40.006$ ,  $p \text{ value} = 0.003 < 0.01$ ) is statistically significant at a value of less than 0.01 which suggests that the groups are different at the model level. Given the significant difference in the models for the male versus female groups, the difference for each of the path coefficients was next tested. The paths from ATE to EI, SN to EI and PBC to EI but also role model to ATE, role model to SN and role model to PBC were constrained to be equal across the male and female groups in this analysis.

As can be seen from Table 3.8, the male students tend to be more influenced by ATE when forming their EI ( $\beta_{\text{Male}} = 0.39$ ) than the female students ( $\beta_{\text{Female}} = 0.24$ ). The effect of SN on EI was stronger in the female group ( $\beta_{\text{Female}} = 0.23$ ) than in the male group ( $\beta_{\text{Male}} = 0.05$ ). Hypotheses 5 and 6 are thus supported. The chi-square difference for the path of PCB to EI was not significant, however, which shows hypothesis 7 to not be supported.

The constrained path from role model to ATE produced a significant increase in the chi-square ( $\Delta\chi^2 = 4.421$ ,  $p < 0.05$ ), which means that gender moderates the path from role model to ATE such that the path is stronger for females ( $\beta_{\text{Female}} = 0.18$ ) than for males ( $\beta_{\text{Male}} = 0.002$ ). Hypothesis 8 is thus supported. The effect of role models on PBC is also significantly stronger for female students ( $\beta_{\text{Female}} = 0.34$ ) than for male students ( $\beta_{\text{Male}} = 0.08$ ), which means that hypothesis 10 is also supported. The effect of role model on SN was not moderated by gender, which means that hypothesis 9 was not supported. Out of the six moderating hypotheses, four were thus (H5, H6, H8 and H10) and two rejected (H7 and H9). Overall, the variance explained by the different determinants of the entrepreneurial intentions of the males versus females was 0.65 and 0.50, respectively.

**Table 3.7** Goodness-of-Fit Indexes for two-group structural models

Moderator	Model	$\chi^2$	$\chi^2/df$	GFI	TLI	CFI	IFI	RMSEA
Gender	Fully constrained model	445.876 (269)	1.658	.870	.9928	.936	.937	.045
	Free model	405.870 (250)	1.623	.881	.931	.944	.945	.044

**Table 3.8** Two group path model estimates

Moderator	Path estimated	$\chi^2$	$\chi^2/df$	CFI	RMSEA	Standardized coefficient estimate:		$\Delta\chi^2$ ( $\Delta df=1$ )	P
						Female	Male		
<b>Gender</b>	H5: ATE→EI	410.955	1.631	.943	.044	.23**	.39**	5.085	<b>P&lt;.05*</b>
	H6: SN → EI	410.874	1.630	.943	.044	.24**	.05	5.004	<b>P&lt;.05*</b>
	H7:PBC →EI	406.740	1.614	.944	.043	.67**	.50**	.87	p>.05
	H8:RM→ATE	410.291	1.628	.943	.044	.18**	.002	4.421	<b>P&lt;.05*</b>
	H9: RM→ SN	407.093	1.615	.944	.043	.14*	.11*	1.223	p>.05
	H10:RM→PBC	412.185	1.636	.942	.044	.34**	.08	6.315	<b>P&lt;.01**</b>

\*P<.05; \*\*P<.01; EI = Entrepreneurial Intention; ATE= Attitudes toward Entrepreneurship; SN= Subjective Norms; PBC= Perceived Behavioural Control; RM=Role Models

### 3.5 Discussion

This study contributes to our understanding of the development of entrepreneurial intentions, particularly within the context of a developing country. Based on the TPB, institutional approach, social cognitive career theory and social cognitive theory but also the literature on entrepreneurial role models and gender differences in entrepreneurship, we formulated a number of hypotheses regarding the determinants of Iranian students' entrepreneurial intentions and investigated the mediating and moderating effects of these determinants within a model of entrepreneurial intentions.

Our findings support previous research findings which showed knowing a successful entrepreneurial role model to exert an indirect, positive effect on the EI of students via the motivational antecedents of EI, namely ATE, SN and PBC. In other words, exposure to an entrepreneurial role model can enhance students' entrepreneurial intentions by showing them that being an entrepreneur is both a feasible and desirable career option. This finding is in line with the existing literature (e.g., Boyd & Vozikis, 1994; Nauta & Kokaly, 2001; Scherer et al., 1991; Krueger, 1993). The correspondence of the present findings with the findings of other studies implies that our conclusions can be generalized to other cultural contexts. Knowing entrepreneurial role models can positively affect a student's PBC, most likely by increasing their knowledge, mastery, or general set of ability with regard to engaging in tasks required for becoming an entrepreneur (BarNir et al., 2011). Knowing role models can also positively influence the ATE of students by fine-tuning their perceptions and making a positive contribution to their evaluation of a career as an entrepreneur. Furthermore, knowing entrepreneurial role models can positively influence SN as well, presumably via the provision of encouragement, support and social influence. The mediation analyses as a whole show knowing entrepreneurial role models to influence students' EI more indirectly via the antecedents of EI than directly. The results of other studies support this finding (e.g., BarNir et al., 2011; Carr & Sequeira, 2007; Kolvereid, 1996b; Krueger, 1993; Scherer et al., 1991).

Entrepreneurial role models exerted a considerable influence on PBC in particular ( $\beta = 0.22$ ). This shows the availability of role models, as Bandura has stated (1986), to be an important source for the development of self-efficacy and individuals' confidence in their ability to start a new business can increase via vicarious learning experience and observation of the behaviour of role models.

As expected, ATE was more positive for male students compared to female students. The SN of the students did not influence the EI of the male students but it strongly influenced the EI of the female students. Thus, in the area of entrepreneurship for Iranian female students, SN are particularly salient and can contribute considerably to their EI — presumably due to the person-orientation of these women and their affiliation and relational needs. ATE were more positive to start with for the Iranian male students relative to the Iranian female students — presumably due to the instrumental orientations of the Iranian men and their need for independence and achievement (e.g., Cross & Madson, 1997; Eagly, 1987; Hofstede, 1980). Previous studies of gender differences in EI (Díaz-García & Jiménez-Moreno, 2010) and the results of studies in other fields (such as information technology) (Grogan, Bell, & Conner, 1997; Konrad et al., 2000; Venkatesh et al., 2000; Morris & Venkatesh, 2000) support the gender differences found for the prediction of EI observed here. And it can thus be concluded that gender plays a crucial role in shaping the EI of students.

One possible explanation for the gender differences in ATE and SN could relate to a predisposition on the part of women to be more communal, be more aware of others' feelings and pay more attention to the opinions of others in making decisions when compared to men (Eagly, 1987; Venkatesh & Morris, 2000). The EI of women are therefore more likely to be influenced by SN than the EI of men. In contrast, men are more predisposed to act autonomously, independent of others, agentively and base their decisions on their own motives and objectives than women (Eagly, 1987; Herring, 1993; Holms, 1992; Kilbourne & Weeks, 1997; Weatherall, 1998; Williams & Best, 1990). The EI of men is therefore more likely to be influenced by their ATE than the EI of women.

An alternative or possibly supplemental explanation may stem from Iranian culture. In the GLOBE cross-cultural study of leadership and organizational culture, Iran's score on gender egalitarianism is relatively low. The norm in Iranian society is to maximize — or in any case not minimize — gender role differences (Dastmalchian et al., 2001). Societies low on gender egalitarianism are described as societies in which relatively large gender role differences exist (House, Javidan, & Dorfman, 2001). The present findings presumably reflect — at least in part — the relatively large gender role differences which exist in Iranian culture to start with and might therefore be more country specific than suspected. Future research should investigate gender

differences in the prediction of EI using a model which is similar to the one used here but then within other cultures.

No support was found for the expected moderating effect of gender on the relationship between PBC and EI. That is, PBC was found to be a relevant determinant of EI for both male and female students. This is contrary to what BarNir et al. (2011) found when they studied the effects of entrepreneurial self-efficacy on EI and found the effects to be stronger for females than for males. In the studies by Wilson et al. (2007) and Díaz-García and Jiménez-Moreno (2010), however, PBC was found to be the most significant predictor of EI for both genders.

One plausible explanation for this contradictory finding with regard to the moderating effects of gender on the relationship between PBC and EI might again stem from Iranian culture and values. Iranians have been found to score low on uncertainty avoidance (House et al., 2004), which may mean that Iranian students are relatively unafraid of situations involving uncertainty and have a relatively strong tolerance for ambiguity. They may also feel more capable of coping with the uncertainty of a new business venture than students from countries with higher scores on uncertainty avoidance (e.g., Greece and Japan). PBC may therefore be a strong predictor of entrepreneurial intention for both genders in Iranian culture, as found in the present study. Environmental conditions in Iran are also not conducive to entrepreneurship. According to a World Bank report (2012), Iran ranks 145th out of 185 countries with respect to the ease of doing business and 83<sup>rd</sup> with respect to the ease of getting credit. In such an environment, confidence in one's ability to start and run a business is thus critical for both men and women. An alternative or possibly supplemental explanation for this contradictory finding might relate to gender-role orientations. According to Mueller and Dato-on (2008), entrepreneurial self-efficacy or PBC is more dependent on 'psychological gender-role orientation' than on biological sex with the latter being what we examined in the present study. Gender-role orientation as opposed to simply gender might therefore moderate the influence of PBC on EI and should therefore be considered in future research.

A major objective of the present research was to see if the relationships between knowing role models and the three antecedents of EI within the TPB differ for men versus women. Our results suggest that this is not the case. The influence of entrepreneurial role models on SN did not differ for men versus women. This means that entrepreneurial role models represent a source of SN for students (Carsrud et al., 2007) regardless of the gender of the students. At this point, we do not have a particularly clear or convincing explanation for the lack of a moderating effect of gender on the relationship between SN and EI. More studies are thus needed to clarify and refine this relationship

With regard to the moderating effects of gender for the influence of role models on either PBC or ATE, both PBC and ATE were more affected by knowing role models for women than for men. This finding is consistent with the results of BarNir et al. (2011) who found exposure to role models to have a stronger effect on women's self-efficacy than on men's. Women are generally more open and sensitive to input from role models than men are (BarNir et al., 2011) and, for this reason, entrepreneurial role models can shape the entrepreneurial attitudes and self-efficacy of females more than entrepreneurial attitudes and self-efficacy of males. It can also be argued that women are more susceptible to social influence — which can stem from role models as well — than men are due to different patterns of socialization (Eagly & Carli, 1981). In addition, role models may provide more training or instructional support for women as opposed to men because they assume or somehow sense that women have a greater lack of entrepreneurial skill than men. Alternatively, role models may give men much less support than women because they assume that the skills are already present for men and thus provide contacts, opportunities to identify and engage in entrepreneurial activities and access to resources instead (BarNir et al., 2011).

Finally, it is possible that both men and women are primarily affected by those role models who are most readily available to them. To the extent that it is easier to find male entrepreneurial role models in the media and the community, men can rely on these models and may therefore need less personal role models. Women, in contrast, will have to draw more upon personal role models (e.g., family, friends) who may provide direct or indirect learning opportunities, resulting in increased self-efficacy belief ((BarNir et al., 2011).

## **3.6 Implications**

### **3.6.1 Theoretical implications**

The results of the present study have several theoretical implications. First, role models indirectly influence EI through its antecedents. These mediating effects demonstrate the TPB assumption that additional person/situational exogenous variables such as role models indirectly affect an individual's intentions via the antecedents of intention (e.g., Ajzen, 1991; Kolvereid & Isaken, 2006). A second theoretical implication is that gender moderates the relationships between role models, attitudes towards entrepreneurship and entrepreneurial intentions. These moderating results demonstrate Fishbein's (1980) notion that exogenous variables such as gender can influence the relative emphasis placed by people on the attitudinal and normative determinants of intention. In addition, the present findings extend our understanding of the role of gender in



entrepreneurship. Previous studies have paid relatively little attention to the moderating effects of gender and variables such as role models within models of EI which draw upon the TPB. In the present study, SN was found to be more important for female students but to play no significant role for male students. In contrast, for male students, ATE proved relatively more important. Role models in general were also found to be more important for female students compared to male students. These findings suggest that male students focus on the instrumental outcomes of entrepreneurship while female students are more sensitive to social factors and the opinions of others with regard to entrepreneurial intention and the decision to become an entrepreneur. Including gender as a potential moderator of the relationships within the TPB can thus help us to gain a better understanding of EI and its antecedents.

### 3.6.2 Practical implications

The results of the present study have several practical contributions and implications for human resource development (HRD). With the growing presence of women in entrepreneurship and at universities, increased sensitivity to the diversity of career choice processes and entrepreneurial intentions is necessary as well as reflection upon differences in the perceptions and motives for entrepreneurship.

Such increased sensitivity should also have implications for entrepreneurship education. To maximize the effectiveness of education and foster entrepreneurial intentions, entrepreneurship education programs should be tailored to the needs of the two genders and emphasize those factors which are salient for each group. For example, educators should be aware that modifying the ATE will produce larger increases in EI for males relative to females while modifying SN will produce larger increases in EI for females relative to males. In other words, male students are driven by instrumental factors while female students are more motivated by expressive, social factors. It is therefore suggested that in single-sex universities, the teaching methods and curricula should be specifically designed to enhance SN and ATE with regard to entrepreneurship for female and male students. SN can be improved with the use of teaching methods which include teamwork and give students opportunities to build a network with entrepreneurial-minded peers, friends, role models and entrepreneurs (Karimi et al., *forthcoming*, a; Mueller, 2011; Souitaris et al., 2007; Weber, 2012). Using such an approach, female students may be helped to overcome the absence of role models and other barriers such as a lack of networking. For male students, educators should emphasize the instrumental benefits of starting a new business (e.g., fulfilment of self-interest, achievement, independence, potential wealth). Attention to these should positively influence the entrepreneurial intentions of male students via the antecedents of such intention.

PBC contributed most to the prediction of entrepreneurial intention for both males and females. The practical implication here is that increasing the frequency of media coverage for start-up business success stories, introducing and integrating an entrepreneurship curriculum into the education system and creating opportunities for extracurricular entrepreneurship activities should be encouraged in order to enhance perceptions of the feasibility of entrepreneurship (GEM, 2010). In particular, training programmes which specifically target the PBC of students can be expected to foster EI and subsequent entrepreneurial behaviour. Studies (e.g., Karimi et al., *forthcoming*) have shown that entrepreneurship education can indeed enhance the entrepreneurial self-efficacy or PBC of students. As already mentioned, moreover, such self-efficacy can be fostered via experiences of mastery, vicarious learning (i.e., role modelling) and social persuasion (Bandura, 1986). Via an action learning approach (or problem-based learning) but also other teaching methods and course characteristics which include practical experience, internships and business planning activities, students can obtain the insight and skill needed to be an entrepreneur and, as a result, develop their entrepreneurial self-efficacy. The present findings suggest that the presence of role models is an important factor for fostering PBC on the part of students and female students in particular. Entrepreneurship education programs and workshops should therefore consider including contact with entrepreneurial role models as part of their curricula. Such role models can foster student confidence in their ability to start a new business, enhance their attitudes towards entrepreneurship and create positive subjective norms with respect to entrepreneurship. In particular, such role models can foster self-efficacy or PBC by providing vicarious learning experiences for students. Teachers can also enhance individual self-efficacy by providing social persuasion and the positive encouragement and feedback and increasing positive affective reactions to engage in entrepreneurship (Karimi et al., *forthcoming*, a). Such an approach is most likely to foster both male and female PBC, but the present results suggest that it is especially relevant for female students.

Educators can invite entrepreneur guest speakers to participate in question and answer sessions, tell their success stories and share their experiences. Guest Speakers can provide real-life examples of how small businesses are built and run, giving students a clear sense of the real world of entrepreneurship and foster a better understanding of both the challenges and opportunities that entrepreneurs may face. Along these lines, Hills (1988) has emphasized that providing real world experiences is imperative for entrepreneurship education.

In a non-traditional and gender-stereotyped career like entrepreneurship, gender matching of the role model may be particularly important for women (Quimby & DeSantis 2006). Gender-matched role models can presumably help break negative career stereotypes (Beamen et al, 2012). Highly competent and successful women in male-dominated occupations can reduce

traditional stereotypes (Lockwood, 2006). Educators should thus strive try to make greater use of female entrepreneurial role models in their curricula and classes.

In sum, the most important contribution of the present results to university education and policy making is the insight that interactions between suitable entrepreneurial role models and potential entrepreneurs should be stimulated as this is very likely to foster entrepreneurship in Iran and female entrepreneurship in particular.

### **3.7 Limitations and Future Research**

The current study has several limitations which point to directions for future research. First, the study utilized a convenience sample composed of students from public universities in Iran. The study findings may therefore not be generalizable to other universities or other contexts. Future research should employ a larger, more representative and randomly selected sample of university students from both public and private universities and other institutions in Iran. This will help validate the present findings. Second, the data collected for this study were all self-report. Future research on entrepreneurial intentions should include other types of data and methods of collection. Third, the present study was a cross-sectional study, which prevented us from examining the influence of role models on entrepreneurial attitudes and intentions over time. Longitudinal study is therefore recommended in the future to trace the influence of role models and any changes in the entrepreneurial attitudes and intentions of students over time. Via longitudinal study, the subsequent effects of intention on the actual occurrence of entrepreneurial behaviour can also be documented.

Future studies should go beyond merely documenting acquaintance with entrepreneurial role models to more carefully examine the mechanisms responsible for the influence of role models on entrepreneurial intention. The similarity of individuals to career role models may be especially important for those women who are interested in more non-traditional careers such as entrepreneurship. Within the context of entrepreneurship, that is, previous research (e.g., Bosma et al., 2012) has indicated that individuals and their role models tend to resemble each other in terms of gender and other characteristics. In addition and as Bandura (1986) originally posited, role modelling, as a source of self-efficacy is more powerful when the role models resemble the individual. Thus, as suggested by Quimby and DeSantis (2006), future research should examine whether the similarity between a student and role models in terms of gender, ethnicity and other demographic characteristics indeed exerts a greater influence on career decisions than dissimilarity. Conversely and as Gibson (2004) states, negative role models can also influence the career choices of students in a negative manner and lead students away from a similar career at

times. Future research should thus consider the effects of negative role models on the entrepreneurial intentions of students as well.

Yet another limitation is that the present pattern of findings might relate to the widespread gender role differences in Iran and therefore be country-specific. Future research should thus investigate gender differences with respect to role models, EI and its predictors in other cultures.

Finally, gender in this study referred to 'biological sex'. This differs from other views of gender such as that of Bem (1981), who used the term 'psychological gender' to indicate an individual's masculinity or femininity. The gender effects observed in the present study could be a result of more masculine or feminine characteristics rather than simply 'biological sex'. Future studies should therefore be designed in order to address this question.

# Chapter 4

## The Influence of Personality Characteristics and Contextual Factors on Entrepreneurial Intentions

This chapter is based on:

Karimi, S., Biemans, H. J. A., Lans, T., Chizari, M., & Mulder, M. (accepted with minor revisions). The role of personality characteristics and contextual factors in entrepreneurial intention in a developing country. *International Journal of Psychology*.

## Abstract

There is extensive evidence on the relationships between personality characteristics and perceived contextual factors and entrepreneurial intentions but less evidence regarding the underlying mechanisms. The purpose of this study was to incorporate personality characteristics and perceived contextual supports into the Theory of Planned Behaviour (TPB) and investigate the mediating role of attitudes towards entrepreneurship and perceived behavioural control. Data were collected from a sample of 331 students at seven public universities in Iran. Mediation analysis using structural equation modelling with bootstrapping indicated that attitudes towards entrepreneurship and perceived behavioural control fully mediated the influences of personality characteristics on entrepreneurial intentions. The results also showed that among contextual factors, only perceived government support had a significant indirect effect on entrepreneurial intentions through perceived behavioural control. Contrary to expectations, perceived university support was not mediated by attitudes toward entrepreneurship and perceived behavioural control but had a direct effect on entrepreneurial intentions. The findings contribute to the entrepreneurship literature and have implications for the design and delivery of entrepreneurship education.

## 4.1 Introduction

Due to the positive effects of entrepreneurship on the promotion of innovation, creation of employment opportunities, increasing productivity and generating social and economic wealth in a country's economy, its promotion is viewed as a national priority by governments around the world (Shane & Venkataraman, 2000; Wong et al., 2005). Therefore, it is crucial to understand what factors influence entrepreneurial intentions (EI) and behaviour within sound theoretical frameworks in order to develop and implement effective (educational) strategies.

In recent decades, many researchers have been focusing on the determinants of EI. Whereas early research focused on certain personality traits as sole predictors, the debate has moved since then via the inclusion of situational parameters and differentiating between proximal (e.g. goals, self-efficacy) and distal individual differences (e.g., achievement motivation), towards the introduction of social psychological models and cognitive processes in entrepreneurship to explain entrepreneurial outcomes (Krueger, 1993; Mitchell et al., 2002; Shook, Priem, & Mcgee, 2003; Rauch & Frese, 2007a). This has led to the idea that: personality may influence entrepreneurial outcomes, however not in isolation, but through mediating factors such as motivational and perceptual factors (Baum, Locke and Smith, 2001; Simon and Houghton, 2002). However, in entrepreneurship research, mediating relationships such as these are rarely studied (Rauch & Frese, 2007a).

An individual is surrounded by an extended range of contextual factors and he/she can be

pushed or pulled by these factors (Hisrich, 1990) and his/her EI is based on a combination of both personal (such as personality) and contextual factors (Boyd & Vozikis, 1994).

In order to design effective programs, educators and policy makers should know which of these factors are decisive for the development of EI. If students' entrepreneurial intentions are primarily shaped by the contextual factors, a change in these factors should have an effect on the entrepreneurial intentions. In this case, government and university policy makers would be well advised to sustain and expand their activities to improve education, infrastructure, legal conditions and financial support for potential business founders. However, these programs would be less likely to foster entrepreneurship if entrepreneurial intentions were primarily grounded not on contextual factors, but on the students' personality. Personality traits are comparatively stable and hard to change in the short term. To encourage new venture activities of students, a university would have to rely mainly on a (self-) selection of promising freshmen (Luthje & Franke, 2003).

To date, research on personality characteristics and contextual factors and intention models in the entrepreneurship domain has been conducted independently. So far, there has been little integration of these variables with social cognitive models such as the Theory of Planned Behaviour (TPB) (Burmúdez, 1999). In other words, investigations focused on the TPB components as mediators between personality and contextual factors and EI has been scant in the domain of entrepreneurship. In addition, as far as we know, no previous attempts have jointly considered these two group variables in a comprehensive model such as the TPB, assessing their (indirect) effects on EI.

The present study attempts to reduce these gaps and develop a model to assess the effects of personality characteristics and contextual factors. This was done in the context of higher education in Iran. As Nabi and Linan (2011) stated, despite the importance of EI in the start-up process, the vast majority of previous research on EI has focused on developed countries and there is little research on the EI, attitudes, and motivations of students and graduates in developing countries. The present study attempts to shed light on this issue by empirically applying the TPB in a developing country, namely Iran.

In the following, we first present the theoretical framework that was used in the current study. Next, we develop a series of hypotheses regarding how attitudes, personality characteristics, and contextual factors influence students' EI and its antecedents. We then describe the sample and the research method and present the results. After we discuss the possible mediating effects, we end the paper with the research implications and some directions for future studies.

## 4.2 Theoretical Framework and Hypotheses

### 4.2.1 Theory of Planned Behaviour

Social psychology literature has shown that intentions are the single best predictor of planned individual behaviours, especially when those behaviours are rare, difficult to observe, or involve unpredictable time lags (Krueger, Reilly, & Carsrud, 2000). Entrepreneurship is a typical example of such planned and intentional behaviour, as it typically includes these elements of rarity and uncertainty (Bird, 1988; Krueger & Brazeal, 1994). In the entrepreneurial context, intention is defined as the “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” (Thompson, 2009, 676). The concept of EI is central to understanding entrepreneurship, as it is the first step in a sustained, long-term process of starting a new business (Krueger, 1993). EI has proven to be a primary predictor of future entrepreneurial behaviour (Kautonen et al., 2013; Kolvereid & Isaksen, 2006; Krueger et al., 2000).

Studies showed that a wide range of individual differences, such as personality traits, influence EI (e.g., Zhao and Seibert, 2006). Over the years, the direct effects of personality on EI have received much research attention (e.g., Bonnett & Furnham, 1991; Shaver & Scott, 1991; Crant, 1996; Koh, 1996) and criticism (Gartner, 1989; Rauch & Frese, 2007a). Trait-based approaches to entrepreneurship have been criticized so much for their methodological and conceptual limitations as for their low explanatory capacity (Gartner, 1989; Hisrich et al., 2007; Santos & Liñán 2007). As pointed out by Reynolds (1997), statistically significant relationships have been demonstrated between specific personality traits and being an entrepreneur, but the value of these personality traits for the *prediction* of entrepreneurship has been found to be quite limited. In response to the criticisms of the trait approaches, researchers have turned to more cognitive models to better understand the complexity of entrepreneurial behaviour (Bridge et al., 2009). Cognitive approaches stress that constructs that are more proximal, such as attitudes and perceived behavioural control are crucial predictors of EI (Karimi et al., 2013; Krueger, et al., 2000).

One well-researched social-cognitive model, which includes these proximal constructs, is the TPB, originally introduced by Ajzen (1988, 1991). The TPB model stresses that three components or antecedents influence the intentions to engage in behaviour. These components are (1) attitudes toward the behaviour, that is, personal evaluation of the behaviour (e.g., being an entrepreneur) or its consequences (Ajzen, 1991); (2) subjective norms (SN), that is, perceived social pressure (not) to perform the behaviour (e.g., being an entrepreneur), and (3) perceived behavioural control (PBC), that is, the perceived difficulty or ease of performing the behaviour



(e.g., becoming an entrepreneur). The theory predicts that greater favourable attitude and SN with respect to the behaviour, along with a strong PBC, increase the intention to perform that particular behaviour. Researchers have empirically applied the TPB to students' EI and confirmed the theory's predictions regarding the effect of attitudes towards entrepreneurship (ATE), SN, and PBC on their EI both in developed and developing countries (Iakovleva et al., 2011) including Iran (Karimi et al., 2013a; Moriano et al., 2011). For instance, Karimi and his colleagues (2012, 213a) found that ATE, SN and PBC significantly influenced Iranian students' EI. These studies support Ajzen's (1991) assertion that all three antecedents are important, although they also show that their relative importance as well as the magnitude of their effect is not the same in every situation and country. Thus, these findings suggest that all three of Ajzen's intention antecedents should be included when examining EI.

**H1:** *Attitudes towards entrepreneurship will positively influence students' entrepreneurial intentions.*

**H2:** *Subjective norms will positively influence students' entrepreneurial intentions.*

**H3:** *perceived behavioural control will positively influence students' entrepreneurial intentions.*

#### **4.2.2 Theory of Planned Behaviour and Personality Characteristics**

According to the TPB, exogenous influences or more distal constructs such as personality characteristics predicted to affect an individual's intention indirectly through their influences on the intention antecedents.

The need for achievement, propensity to take risk and locus of control, which are termed "the Big Three" (Chell, 2008)", have frequently been counted as part of the 'personality' of new venture creators and identified as correlates of being or desiring to be an entrepreneur and have proven their importance in affecting the level of aspiration towards entrepreneurship (Brockhaus 1982; Ahmed, 1985; Robinson et al., 1991; Shaver & Scott, 1991; Koh, 1996; Reimers-Hild, 2005; Gurel et al., 2010; Frank et al., 2007).

Need for achievement, or achievement motivation, refers to expectations of doing something better or faster than anybody else or better than the person's own earlier accomplishments (Hansemark, 2003). Individuals having the need for achievement are ambitious, hardworking, competitive, and keen to improve their social standing, and place a high value on achievements (McClelland, 1961). Risk taking is usually defined either as a probability function or as an individual disposition towards risk (Rauch & Frese 2007a). In other words, risk taking propensity can be defined as a personality trait involving the willingness to pursue decisions or courses of action that involve uncertainty regarding success or failure outcomes (Jackson, 1994). Risk taking propensity is identified as a trait that distinguishes entrepreneurs from non-

entrepreneurs and managers (Ahmed, 1985; Shane, 1996; Stewart and Roth, 2001, 2004). Locus of control refers to an individual's perception about the underlying main causes of events in his/her life. While individuals with an internal locus of control believe that they are able to control what happens in their lives and their destinies, and life outcomes are the result of their own actions, such as hard work, individuals with an external locus of control believe that most of the events in their lives are the result of factors extrinsic to themselves, such as chance, luck, fate or powerful others (Rotter, 1966; Shook et al., 2003). Individuals who are reluctant to believe in their ability to control the environment though their actions would also be expected to be reluctant to assume the risks that starting a business entail (Mueller and Thomas, 2001). Generally, entrepreneurs are found to have an internal rather than an external locus of control (Beugelsdijk & Noorderhaven, 2005; Lee & Tsang, 2001; Nelson, 1991; Perry et al., 1986). Therefore, these three important personality characteristics are investigated in this study. Moreover, from the afore mentioned classical antecedents from the TPB (that is SN, ATE and PBC) the latter two seem to be the most strongly related to intentions (e.g., Linan and Chen, 2009; Karimi et al., 2013a) as well as have the most direct relationships with personality (Fini et al., 2012; Obschonka et al., 2010; Zhao et al., 2005). Hence, the hypothesized relationships between need for achievement, locus of control, and risk taking and ATE and PBC respectively and eventually EI are explained into more detail.

#### **4.2.2.1. Personality Characteristics and Attitudes towards Entrepreneurships**

Eagly and Chaiken (1993) stated that human motivation influences attitude. According to Fini and colleagues (2012) the idea that psychological characteristics, in terms of emotional and motivational forces, impinge upon the cognitive system and influence attitudes has been central to three broad theoretical traditions: the reinforcement perspective (Hovland, Janis, & Kelley, 1953), the cognitive consistency perspective (Heider, 1946) and the functional perspective (Katz, 1960). According to such theories, people cognitively process the likelihood of being exposed to a specific event, evaluate their ability to deal with such a stimulus, alter their attitudes accordingly (Rogers, 1975) and—coherently with the TPB—develop a favourable or unfavourable evaluation or appraisal of the focal behaviour (Fini et al., 2012).

Some empirical studies showed that internal locus of control has a positive effect on entrepreneurial attitude (e.g., Hatten & Ruhland, 1995; Luthje & Franke, 2003). Robinson et al. (1991) found that achievement and internal personal control positively influenced entrepreneurial attitudes. Bonnett and Furnham (1991) and Herron and Robinson (1993) found that internal locus of control was associated with the student's desire to become an entrepreneur. Luthje and Franke (2003) reported that risk taking propensity and locus of control had indirect effects on students' EI

through ATE. The study of Fini et al. (2012) also showed that ATE can mediate the effects of risk-taking propensity on EI. Drawing on all these findings, we hypothesize that ATE can mediate the effects of personality characteristics on EI. In other words, as students have higher need for achievement, propensity to take risk, and internal locus of control, they develop a favourable appraisal of the entrepreneurial behaviour, which in turn is associated with higher EI. Thus:

**H4:** *Attitude towards entrepreneurship will mediate the relationship between the need for achievement and entrepreneurial intentions.*

**H5:** *Attitude towards entrepreneurship will mediate the relationship between risk taking and entrepreneurial intentions.*

**H6:** *Attitude towards entrepreneurship will mediate the relationship between locus of control and entrepreneurial intentions.*

#### **4.2.2.2. Personality Characteristics and Perceived Behavioural Control**

We also expect the three personality characteristics to have direct influences on PBC or self-efficacy and indirect influences on EI through PBC. Individuals with a high need for achievement are more self-confident (McClelland, 1965) and have higher ability to prevail in difficult circumstances (Slocum et al., 2002). Therefore, we posit that individuals high in achievement motivation would have confidence in their abilities to start a new business that would increase their EI. To our knowledge, there is no empirical study to explore the effect of need for achievement on entrepreneurial self-efficacy or PBC. Carsrud and Brännback (2011) call for research on how the need for achievement impact entrepreneurial self-efficacy.

As already mentioned, locus of control refers to the degree to which one generally perceives events to be under their control (internal locus) or under the control of powerful others (external locus; Rotter, 1966). People who view outcomes as self-determined, but lack the necessary skills, would experience low self-efficacy and view activities with a sense of futility (Bandura, 1977). Chen et al.' (1998) study showed that locus of control is positively related to self-efficacy. Moreover; it has been found that perceived environmental controllability is related to greater self-efficacy (Phillips & Gully, 1997; Wood & Bandura, 1989). Therefore, it is reasonable to expect that individuals with more internal locus of control (than external locus of control) will have higher self-efficacy (Phillips & Gully, 1997). According to Bandura (1986) one of the routes to influence of the individuals' self-efficacy is their judgments of their own physiological states such as arousal and anxiety. Studies show that people with an internal locus of control tend to be less anxious than those with an external locus of control (e.g., Ray & Katahn, 1968; Archer, 1979) in uncertain situations (such as starting a new business) because they feel they have control over the environment and the outcome of their actions and rely on their own abilities in this kind of

situation. Therefore, people with an internal locus of control are likely to have less anxiety and to be confident in their abilities to fulfil a given behaviour (such as starting a new business).

The relationship between risk taking and PBC has also been investigated in the entrepreneurship literature, nonetheless on a very limited basis. As Zhao et al. (2005) argue, risk taking propensity is expected to be related to the individual's judgments of his/her own physiological state such as arousal and anxiety while pursuing an entrepreneurial venture. People with high risk propensity tend to be more comfortable dealing with situations of risk, such as an entrepreneurial start-up, therefore they are likely to anticipate experiencing less debilitating anxiety about an entrepreneurial career, perceive a greater sense of control over outcomes, judge the likelihood of receiving positive rewards more highly, and thus possess higher self-efficacy (Zhao et al., 2005). The results of the study done by these scholars among business administration students across five USA universities showed that risk propensity had an indirect effect on EI via self-efficacy. Based on these findings, we expect that PBC mediates the relationships between personality characteristics and EI. In other words, it is plausible that these personality characteristics enhance students' PBC, which in turn, brings about higher intention to start up business. Obschonka et al., (2010) suggest that personality has an indirect effect on EI via PBC. Although there is no empirical evidence to support the indirect effect of need for achievement and locus of control on EI through the mediation of self-efficacy or PBC, in line with the above arguments, the following hypotheses are proposed:

**H7:** *Perceived behavioural control will mediate the relationship between need for achievement and entrepreneurial intentions.*

**H8:** *Perceived behavioural control will mediate the relationship between risk taking and entrepreneurial intentions.*

**H9:** *Perceived behavioural control will mediate the relationship between locus of control and entrepreneurial intentions.*

### **4.2.3 Contextual Factors**

According to institutional economic theory (North 1990, 2005) environmental or contextual factors can be assumed to play an important role in the shaping of individual attitudes and economic behaviour, including entrepreneurship. Contextual factors can facilitate or obstruct entrepreneurial activities, and they may play an important role in the formation of an individual's intention to create a new business (e.g., Pittaway & Cope, 2007; Carayannis et al., 2003; Lüthje & Franke, 2003). These variables cannot, therefore, be ignored when EI is being studied. The TPB appear to provide an appropriate framework to explore the relationship between the

environment and the individual in the entrepreneurial process (Shapero, 1982; Ajzen, 1991). However, few studies have investigated this relationship within the TPB.

Franke and Lüthje (2004) state that both the macro environment (that is, economic, political and cultural climate, administrative complexities, and government support measures and procedures) and the micro environment (that is, the university with its tasks of initiating, developing and supporting entrepreneurship as well as inspiring, training, actively supporting, and facilitating networking among students) need to be included. Furthermore, it is recommended by scholars (e.g., Kristiansen & Indarti, 2004; Arenius & Minniti, 2005; Van Stel & Stunnenberg, 2006) to include subjective perceptions of the environment instead of the actual environment because perceptions of the environment by an individual are expected to be more influential for EI than the actual environment. The present study examines three perceived contextual factors: perceived university support (that is, the degree to which the university is perceived to provide needed knowledge, skills, and inspiration for starting up a new venture), perceived environmental support (that is, the degree to which social, cultural, and economic climate are perceived positively), and perceived government support (that is, the degree to which government support of business start-up, such as bureaucratic procedures and financing factors, are perceived positively).

It is expected that contextual factors can change individuals' evaluation of entrepreneurship or ATE. It is almost certain that the individual's attitudes are shaped by their social environment (Salancik & Pfeffer, 1987). Shapero (1982) stated that entrepreneurial desirability or attitude is dependent on the social system of which the individual is part (such as educational and professional contexts). Therefore, we assume that if a student perceives the environment conditions including social, cultural, and financial supports as very favourable to entrepreneurship, his/her attitude toward becoming an entrepreneur might become more positive. To our knowledge no previous study has explored the effects of perceived contextual factors on students' ATE.

It is also expected that contextual factors or environmental conditions influence PBC. The more resources individuals think they possess, and the fewer obstacles or impediments they anticipate, the greater should be their perceived control over the behaviour (Ajzen, 1991). That is, the resources available to a person must to some extent dictate the likelihood of behavioural achievement (Ajzen, 1991). Access to resources such as investment funds, subsidies, information and supports gives one the confidence to take a step into uncertain occupations such as entrepreneurship. Finally, enactive mastery (learning from doing) and vicarious learning (modelling) are two important sources of self-efficacy (Bandura, 1986). Contextual factors, especially university environment, may provide opportunities for vicarious experience or enactive

mastery by providing programs that engage students in different activities known to foster self-efficacy and invite guest entrepreneurs as speakers who can serve as successful role models for students. To summarize, it is expected that when students perceive their environment as supportive and as offering resources and support mechanisms to start a new business, they feel more confident and optimistic about their abilities to start up and control a new business.

Based on these arguments, we expect that contextual factors influence ATE and PBC, which in turn, influence EI. In other words, we expect that individuals who perceive their environment as supportive to entrepreneurship could feel they have the ability to start up a business and positive evaluation of entrepreneurship. These positive feeling and evaluation, in turn, could increase their intention to start up a business.

Although there have been no studies to investigate the mediating role of ATE and PBC or self-efficacy between the contextual factors and EI, some studies show that ATE (e.g., Carr & Sequeira, 2007, Fini et al., 2012; Goethner et al., 2012) and PBC (Fini et al., 2012; Goethner et al., 2012; Zhao et al., 2005) can mediate the effects of other variables on intention. From this reasoning, the following hypotheses are formulated:

**H10:** *Attitude towards entrepreneurship will mediate the relationship between perceived university support and entrepreneurial intentions.*

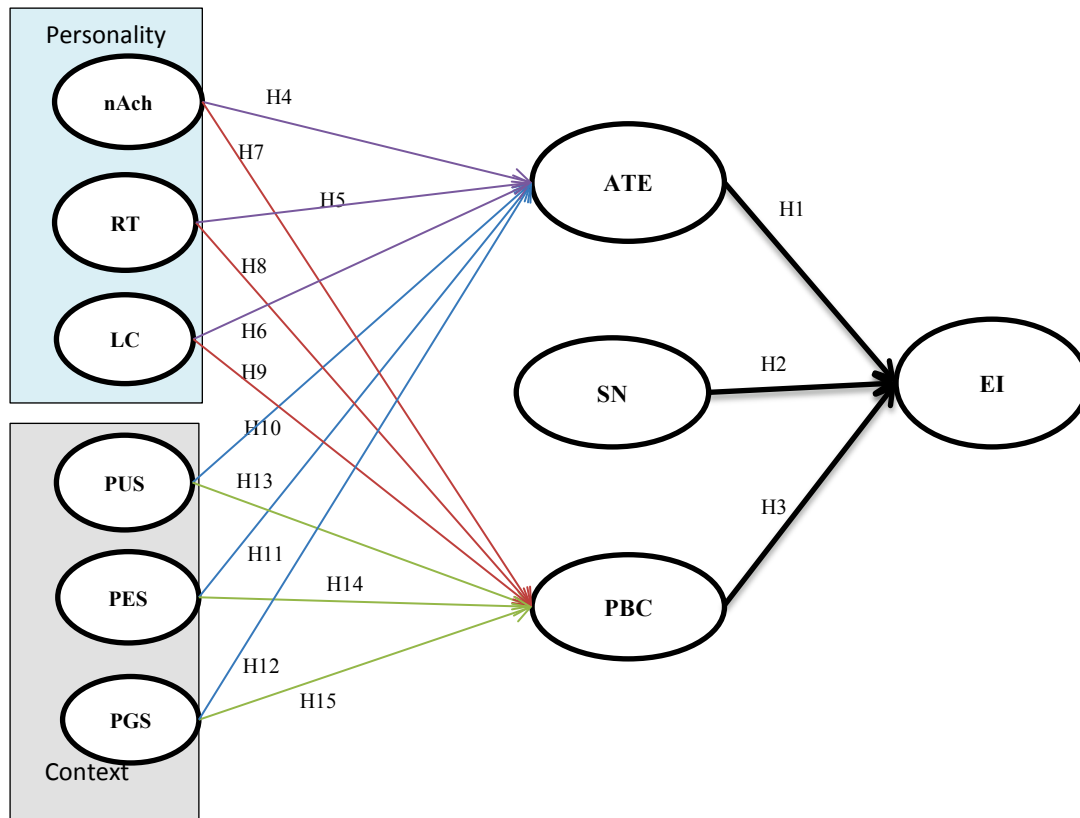
**H11:** *Attitude towards entrepreneurship will mediate the relationship between perceived environmental support and entrepreneurial intentions.*

**H12:** *Attitude towards entrepreneurship will mediate the relationship between perceived government support and entrepreneurial intentions.*

**H13:** *Perceived behavioural control will mediate the relationship between perceived university support and entrepreneurial intentions.*

**H14:** *Perceived behavioural control will mediate the relationship between perceived environmental support and entrepreneurial intentions.*

**H15:** *Perceived behavioural control will mediate the relationship between perceived government support and entrepreneurial intentions.*



ATE = Attitudes toward entrepreneurship; SN = Subjective Norms; PBC = Perceived Behavioral Control; EI = Entrepreneurial Intentions; nAch= Need for Achievement; LC = Locus of Control; RT = Risk Taking; PUS = Perceived University Support; PES = Perceived Environmental Support; PGS = Perceived Government Support

Figure 4.1 The hypothesized model of entrepreneurial intentions

## 4.3 Research Method

### 4.3.1 Sample and Data Collection

Data was collected from 400 Bachelor of Science (BSc.) and Master of Science (MSc.) students who had participated in entrepreneurship courses at seven public universities in Iran during the 2010–2011 academic year. This is a convenience sample as frequently used in entrepreneurship research (de Jorge et al., 2012; Karimi et al., *forthcoming*, b; Krueger et al., 2000, Liñán et al., 2011). These students were targeted on the basis of the assumption that they would be more likely to start a business (Hornaday & Vesper, 1982) and, because they were in their last years of college, it was assumed that they would have fairly clear vision of their plans for the future and imminent career decisions (Krueger et al., 2000). With the approval and cooperation of the lecturers, the questionnaires were distributed during the class session. The original questionnaire was in English. It was modified slightly for purposes of the present research, carefully translated into Persian and then translated back into English to check for the adequacy of the translation. The questionnaire was then distributed to a pilot group of 28 undergraduate students to

determine its clarity and the face validity of the constructs. The students could comprehend the translated questionnaire after minor changes. The respondents were given half an hour to complete the questionnaire. No monetary compensation was given to the participants, but they received a small gift for participating. In total, 346 questionnaires were collected indicating a response rate of 87%. Data were screened for missing data and outliers (Hair et al., 2010), after this validation process, 331 useful responses were obtained. The sample consisted of 255 BSc. students (77%) and 76 MSc. students (23%). In general terms, the sample comprised 23% of entrepreneurship-related majors and 77% of non-entrepreneurship related majors (53% of Agriculture Sciences, 16% of Computer Sciences and 8% of Humanity Sciences). The sample consisted of 127 male students (38.4%) and 204 female students (61.6%). The majority of the respondents were between 21-25 years of age (80%) and the average their age was 22.46 years.

### 4.3.2 Measures

All items (aside from demographic characteristics – see the Control Variables section) were measured using a seven-point Likert scale between ‘1’ representing ‘strongly disagree’ and ‘7’ representing ‘strongly agree’. All construct measures were adopted from existing scales. These items, and the sources from which the items were adapted, are summarized in Table 4.1.

**Table 4.1** Details of constructs

Construct	Research reference	No. of Item	Cronbach's alpha ( $\alpha$ )
<b>Entrepreneurial Intentions</b>	Linan and Chen (2009), e.g., “I’m ready to make anything to be an entrepreneur.”	6	.84
<b>Attitude toward Entrepreneurship Subjective Norm</b>	Linan and Chen (2009), e.g., “Being an entrepreneur implies more advantages than disadvantages to me” Kolvereid (1996), which has been used in Kolvereid and Isakson (2006); and Krueger et al. (2000). This scale included two separate questions: belief (for example, “I believe that my closest family thinks that I should start my own business”) and motivation to comply (for example, “I care about my closest family’s opinion with regard to me starting my own business”). The belief items were recoded into a bipolar scale (from -3 to +3) and multiplied with the respective motivation-to-comply items.	5	.80
<b>Perceived behavioral control</b>	Linan and Chen (2009); for example, “Starting a firm and keeping it viable would be easy for me.”	6	.88
<b>Need for achievement</b>	Taken from Cassidy and Lynn (1989): e.g., “It is important to me to perform better than others on a task.”	7	.67
<b>Risk taking propensity</b>	Gomez-Mejia and Balkin (1989) e.g., “I’m not willing to take risks when choosing a job or a company to work for”	4	.80
<b>Locus of control</b>	Taken from Rotter (1966), e.g., “my life is determined by my own actions”	5	.79
<b>Perceived university support</b>	Autio et al. (1997), Franke and Lüthje (2004), Schwarz et al. (2009), Turker and Selcuk (2009) and Linan and Chan (2009); e.g., “My university provides students with the knowledge required to start a new company.”	4	.84
<b>Perceived environmental support</b>	Autio et al. (1997), Franke and Lüthje (2004), Schwarz et al. (2009), Turker and Selcuk (2009) and Linan and Chan (2009); e.g., “Iran’s economy provides many opportunities for entrepreneurs.”	3	.80
<b>Perceived government support</b>	Autio et al. (1997), Franke and Lüthje (2004), Schwarz et al. (2009), Turker and Selcuk (2009) and Linan and Chan (2009); e.g., “The bureaucratic procedures for founding a new company are unclear.”	4	.77



### 4.3.3 Control Variables

To minimize spuriousness of the results we included five empirical significant control factors of entrepreneurial intentions (e.g., Autio et al., 2001) in the study: Age, gender (coded as 1 for male and 0 for female), education level (coded as 0=BSc. and 1= MSc.), academic major (coded as 0=not entrepreneurship-related and 1=entrepreneurship-related major), and university ranking (coded as 3=high ranking, 2=intermediate ranking and 1=low ranking).

### 4.3.4 Statistical method

SPSS 18.0 was used to conduct data analysis using frequencies, Pearson correlations, reliability, and Exploratory Factor Analysis (EFA). Confirmatory factor analysis (CFA), analysis of the measurement model, and structural equation modelling (SEM) analysis were conducted using AMOS18.0. SEM has been a widely accepted method for data analysis in the behavioural and social sciences during the last decade (Baumgartner and Homburg, 1996; Shook et al., 2004). For the present study, the use of SEM is pertinent because of its ability to examine a series of dependence relationships simultaneously, especially where there are direct and indirect effects among the constructs within the model (Hair et al., 2010). The bootstrap method was also used to test the significance of the mediation effects in SEM as recommended by previous researchers (Cheung & Lau, 2008; Preacher & Hayes, 2008). Bootstrapping is the best approach to testing direct and indirect effects in mediation models (MacKinnon, Lockwood, & Williams, 2004), and results from this technique have been proven to be more reliable and accurate than previous mediation tests (Cheung & Lau, 2008). Finally, multiple mediation was employed to explicitly examine which TPB components mediated the effect of personality characteristics and contextual factors on EI.

## 4.4 Analysis and Results

### 4.4.1 Exploratory Factor Analysis

As a first step, we ran an EFA to identify the underlying dimensionality of the 47 items measuring the ten key constructs in the hypothesized model and eliminated those with weak or cross-loadings. Seven items related to different variables were eliminated because their factor loadings were below 0.5 or their cross loadings were greater than 0.4. A new factor analysis was performed for the 40 remaining items. All loadings were acceptable (>0.5), providing further support for the instrument used in this study. Reliability of the factors was calculated using the Cronbach's alpha. As can be seen in Table 4.1, the reliability value for each construct was above, or close to, the value of 0.70, which meets acceptable limits, indicating that the measurement scales of the constructs were stable and consistent (Hair et al., 2010).

#### 4.4.2 Structural Equation Modelling

According to Hair et al. (2010) it is appropriate to adopt a two-step approach in Structural Equation Modelling (SEM): (a) the assessment of the measurement model, (b) and the assessment of the structural model. The first step, involving Confirmatory Factor Analysis (CFA), was to test the reliability and construct validity of the proposed measurement model. Once a satisfactory measurement model was obtained, the second step, involving SEM, was to test the structural theory.

##### 4.4.2.1. Assessment of the measurement model

**Assessment of the fit of the model:** A CFA was carried out with all ten constructs. Although the initial measurement model yields an acceptable model fit, some modification was made to determine a model that better fit the data. One indicator was eliminated based on modification indices. CFA indicated that although the chi-square statistic was significant (Chi square= 980.747;  $P < 0.01$ ) as is common with large sample sizes, the revised measurement model fits the data reasonably well ( $\chi^2/df= 1.521$ ; GFI=0.870; TLI=0.931; CFI=0.940; IFI=0.941; RMSEA=0.040). Therefore, on the basis of the results obtained, the hypothesized model of ten constructs is a suitable measurement model for this study (Table 4.2).

**Table 4.2** Summary of Goodness of Fit Indices for the Measurement Model.

Fit indices	$\chi^2$	P	$\chi^2/df$	GFI	CFI	TLI	IFI	RMSEA
Value	980.747	.000	1.521	.870	.940	.931	.941	.040
Suggest value		>0.05	<3	>0.80	>0.90	>0.90	>0.90	<0.07

**Convergent validity:** To assess convergent validity, we can use three criteria suggested by Fornell and Larcker (1981): 1) Factor Loadings, 2) Construct or Composite Reliabilities, and 3) Average Variance Extracted (AVE) by each construct.

Table 4.3 shows that all items' critical ratio (CR= t) value exceed 8.00 ( $p < 0.01$ ) and all loadings are more than 0.5. As shown in Table 4.4, all constructs also had a construct reliability value, ranging from 0.72 to 0.91, higher than the recommended level of 0.70 (Nunnally & Bernstein, 1994). With respect to the AVE estimate, an examination of the results reveals that except for the need for achievement which at 0.46 is slightly below the recommended threshold, all constructs are greater than 0.5 (Fornell & Larcker, 1981). Thus, all constructs of the measurement model demonstrated adequate reliability and convergent validity.

**Discriminant validity:** According to Fornell and Larcker (1981) if the square root of AVE estimate for each construct is greater than the correlation between that and all other constructs in the model, then discriminant validity is demonstrated. As can be seen in Table 4.4, the square root of AVE that was extracted, ranging from 0.68 to 0.85, is greater than the correlations of the nine constructs, which falls to between 0.01 and 0.62. This means the indicators have more in common with the construct they are associated with than they do with other constructs (Fornell & Larcker, 1981). Therefore, the results have demonstrated evidence of discriminant validity for the study constructs.

**Table 4.3** Results of confirmatory factor analysis for the proposed model

Latent variable	Items	Standardized Factor Loading	T-value (critical ratio)	Construct Reliability	AVE
<b>Entrepreneurial intention</b>	Y1-I'm ready to make anything to be an entrepreneur.	.65		.84	.52
	Y2-My professional goal is to become an entrepreneur.	.75	10.74		
	Y3-I will make every effort to start and run my own business.	.77	11.50		
	Y4-I'm determined to create a firm in the future	.74	11.02		
	Y5-I have very seriously thought in starting a business.	.68	8.73		
<b>Attitudes toward entrepreneurship</b>	X1-A career as an entrepreneur is totally unattractive to me	.54		.82	.55
	X2-If I had the opportunity and resources, I would love to start a business	.63	9.54		
	X3-Being an entrepreneur would give me great satisfaction	.85	9.90		
	X4-Being an entrepreneur implies more advantages than disadvantages to me	.89	9.95		
<b>Subjective norms</b>	X5- Closest family (belief*recoded motivation)	.73		.78	.54
	X6- Closest friends (belief*recoded motivation)	.66	10.09		
	X7-Important others (belief*recoded motivation)	.81	10.54		
<b>Perceived behavioral control</b>	X8-Starting a firm and keeping it viable would be easy for me	.77		.88	.60
	X9- I believe I would be completely unable to start a business	.90	15.86		
	X10- I am able to control the creation process of a new business	.77	12.26		
	X11- It would be <i>very easy</i> for me to develop a business idea	.72	10.83		
	X12-I know all about the practical details needed to start a business	.69	12.10		
<b>Need for achievement</b>	X13-Hard work is something I like to avoid (r).	.49		.72	.46
	X15-It is important to me to perform better than others on a task	.79	7.155		
	X16-I believe I would enjoy having authority over other people	.73	7.148		
<b>Risk taking propensity</b>	X17-I'm not willing to take risks when choosing a job or a company to work for	.58		.80	.51
	X18-I prefer a low risk/high security job with a steady salary over a job that offers high risks and high rewards	.82	10.05		
	X19-I prefer to remain in a job that has problems that I know about rather than take the risk of working at a new job that has unknown problems even if the new job offers greater rewards	.70	9.32		
	X20- I view risk on a job as a situation to be avoided at all costs	.73	9.60		
	X21- My life is determined by my own actions	.64			
<b>Locus of control</b>	X22-When I get what I want, it is usually because I am lucky (r).	.77	10.03	.80	.51
	X23- Whether or not I am successful in life depends mostly on my ability	.72	10.38		
	X24- What happens in my life is mostly determined by powerful others (r)	.65	9.60		
	X25- My university provides students with the knowledge and information required to start a new company.	.75			
<b>Perceived university support</b>	X26- My university develops my entrepreneurial skills and abilities.	.82	14.14	.91	.72
	X27-The creative university atmosphere inspires us to develop ideas for new businesses	.97	15.74		
	X28- The education in my university encourages me to develop creative ideas for being an entrepreneur	.84	14.48		
<b>Perceived environmental support</b>	X29-Entrepreneurs have a positive image in Iranian society.	.83		.78	.55
	X30- Qualified consultants and service support for new companies are available.	.70	8.00		
	X31- Iran's economy provides many opportunities for entrepreneurs.	.68	7.39		
<b>Perceived government support</b>	X32- State laws (rules and regulations) are adverse to running a business (r).	.70		.82	.54
	X33- Obtaining loans and credit from banks is quite easy for entrepreneurs in Iran.	.77	11.65		
	X34- The bureaucratic procedures for founding a new business are clear.	.70	10.81		
	X35- There are not sufficient subsidies available for new companies (r).	.76	11.45		

\*\*p &lt; 0.01

**Table 4.4** Correlations and square roots of AVE estimates in bold on the diagonal for all variables

Variable	Mean	SD	1	2	3	4	5	6	7	8	9	10
1-Entrepreneurial intention	4.97	1.38	<b>(.72)</b>									
2- Attitudes toward entrepreneurship	5.35	.87	.43**	<b>(.74)</b>								
3- Subjective norms	3.07	5.84	.33**	.18**	<b>(.73)</b>							
4- Perceived behavioural control	4.38	1.34	.62**	.26**	.27**	<b>(.77)</b>						
5- Need for Achievement	5.72	1.00	.34**	.32**	.06	.36**	<b>(.68)</b>					
6- Risk taking propensity	3.92	1.54	.21**	.13**	-.09	.18**	.13*	<b>(.71)</b>				
7- Locus of control	5.72	1.00	.23**	.30*	.12*	.24**	.38**	.05	<b>(.71)</b>			
8- Perceived university support	3.57	1.61	.15**	.03	.02	.12*	.05	.11*	.08	<b>(.85)</b>		
9- Perceived environmental support	3.67	1.30	.12*	-.03	.12*	.14*	.02	-.08	.02	.43**	<b>(.74)</b>	
10- Perceived Government support	2.71	1.19	.02	-.02	.07	.15**	-.07	.13*	-.05	.16**	.24**	<b>(.73)</b>

\*\* . Correlation is significant at the 0.01 level (2-tailed).

\* . Correlation is significant at the 0.05 level (2-tailed).

<sup>a</sup> The square root of AVE estimate in bold on the diagonal

#### 4.4.2.2. Assessment of the structural model

Once a satisfactory measurement model was obtained, the second step, involving SEM, was to test the structural theory. The structural model includes the hypothesized relationships among latent constructs in the research model. The overall goodness of fit statistics showed that the structural model fits the data well (Figure 4.2).

**Alternative Models:** To determine whether our model was the best-fitting solution, we compared our hypothesized model to five alternative models (Table 4.5). Model 1 added a direct path from need for achievement to EI. Model 2 added a direct path from risk taking to EI. Model 3 added a direct path from locus of control to EI. Model 4 added a direct path from university support to EI. Model 5 added a direct path from environmental support to EI. These added paths were supported by the correlation analysis which showed a significant correlation between these variables. If fit indices improve significantly with the inclusion of these direct paths, partial mediation would be supported (Perugini and Conner, 2000). The results indicated that models 1, 2, 3, and 5 did not significantly improve the model fit. It is worth noting that four the added paths were not significant ( $p > .05$ ). However, Model 4 indicated a significantly improved fit to the data ( $\Delta\chi^2=4.105$ ,  $p<0.01$ ). Other indices also showed evidence of an improved fit for this model and the added path was also significant ( $\beta=0.10$ ,  $p < 0.05$ ). Thus, Alternative Model 4 was retained as the best-fitting solution and used to examine our hypotheses.

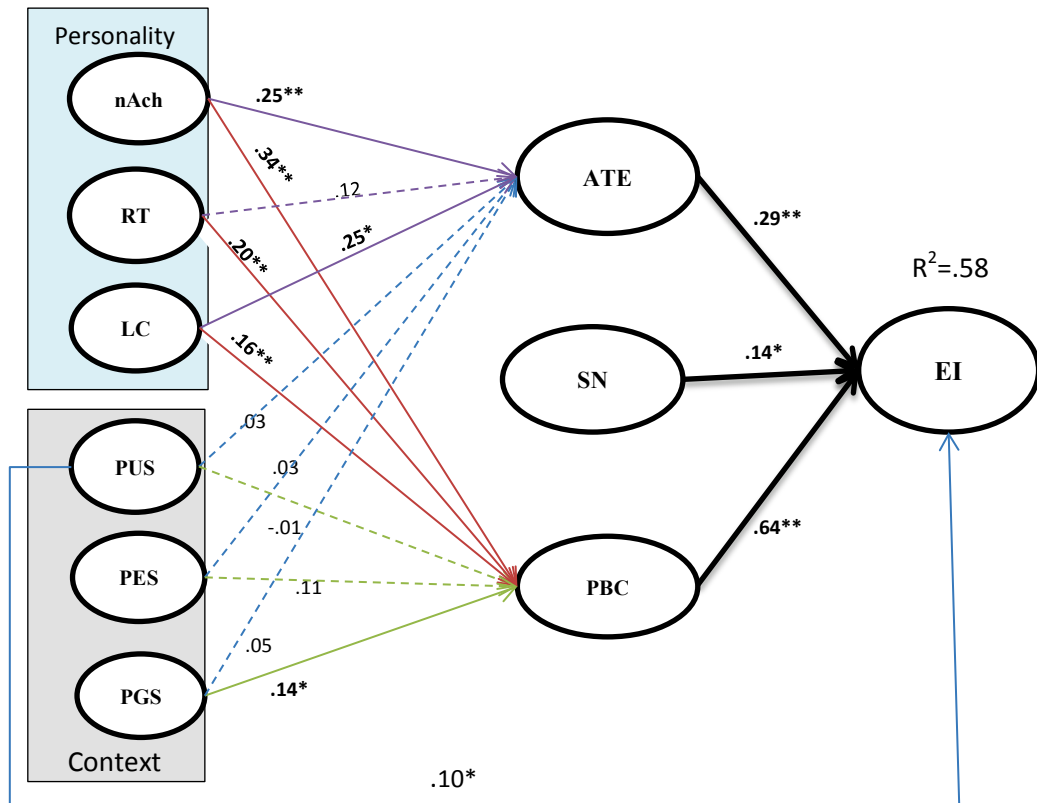
**Table 4.5** Comparison of Hypothesized model with Alternative models

Model	$\chi^2$ (df)	$\Delta\chi^2$	$\chi^2/df$	GFI	TLI	CFI	IFI	RMSEA
Hypothesized model	1110.040 (672)		1.652	.855	.913	.921	.922	.044
Alternative model 1	1109.770 (671)	0.27	1.654	.855	.913	.921	.922	.045
Alternative model 2	1108.090 (671)	1.95	1.651	.855	.913	.922	.922	.044
Alternative model 3	1109.256 (671)	.784	1.653	.855	.913	.922	.921	.044
Alternative model 4	1105.935 (671)	4.105	1.648	.855	.914	.922	.923	.044
Alternative model 5	1108.668 (671)	1.372	1.652	.855	.913	.922	.923	.044

Having assessed the fit indices for the measurement model and the structural model, the estimated coefficients of the causal relationships among constructs were examined (Figure 4.2). From Table 4.6 and Figure 4.2, it can be seen that the predictive positive effect of ATE to EI is supported (H1:  $\beta=0.29$ ,  $CR=4.721$   $p<0.001$ ), which corresponds to the first research hypothesis. The second hypothesis is also supported, that is the SN have a positive effect on EI (H2:  $\beta=0.14$ ,  $CR=2.732$ ,  $p<0.01$ ). The PBC also has a significant impact on EI (H3:  $\beta=0.64$ ,  $CR=7.859$ ,  $p<0.001$ ).

Moreover, the results indicate that need for achievement and locus of control significantly influence ATE and PBC; however propensity to take risk only has a significant effect on PBC, but does not affect ATE. With regard to the effects of contextual factors on ATE and PBC, the results of path analysis indicate that only perceived government support significantly influences PBC. Together, these nine determinants accounts for 58% of the variance in EI. The combined effects of personality characteristics and perceived contextual factors also explain 14% of the variance in ATE and 22% of the variance in PBC.

To control for any effects relating to the students' gender, age, educational level, academic major, and university ranking, these variables were added as control variables to the proposed model. Non-significant improvement in all the fit indices was found in the re-estimated model ( $\chi^2=1465.935$ ;  $\chi^2/df=1.702$ ;  $GFI=0.835$ ;  $TLI=0.896$ ;  $CFI=0.906$ ;  $IFI=0.907$ ;  $RMSEA=0.046$ ; see Figure 4.3 for details). This eliminated the possibility of an alternative explanation to the estimation findings by these control variables.

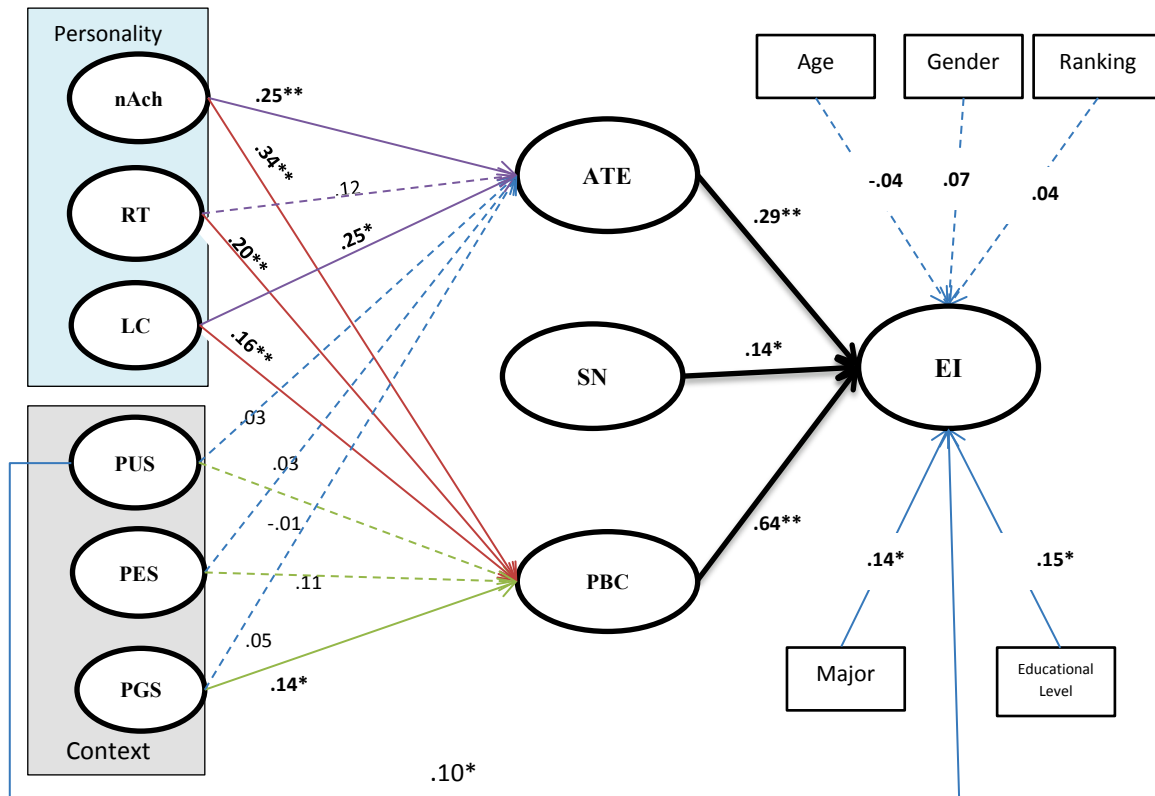


\* $P < .05$ , \*\* $P < .01$

**ATE** = Attitudes toward entrepreneurship; **SN** = Subjective Norms; **PBC** = Perceived Behavioral Control; **EI** = Entrepreneurial Intentions; **nAch** = Need for Achievement; **LC** = Locus of Control; **RT** = Risk Taking; **PUS** = Perceived University Support; **PES** = Perceived Environmental Support; **PGS** = Perceived Government Support

**The goodness of fit indices:**  $\chi^2=1105.935$ ;  $\chi^2/df=1.648$ ;  $GFI=0.855$ ;  $TLI=0.914$ ;  
 $CFI=0.922$ ;  $IFI=0.923$ ;  $RMSEA=0.044$

**Figure 4.2** Path model estimates for the hypothetical model



\* $P < .05$ , \*\* $P < .01$

ATE = Attitudes toward entrepreneurship; SN = Subjective Norms; PBC = Perceived Behavioral Control; EI = Entrepreneurial Intentions; nAch= Need for Achievement; LC = Locus of Control; RT = Risk Taking; PUS = Perceived University Support; PES = Perceived Environmental Support; PGS = Perceived Government Support

The goodness of fit indices:  $\chi^2=1465.935$ ;  $\chi^2/df=1.702$ ; GFI=0.835; TLI=0.896; CFI=0.906; IFI=0.907; RMSEA=0.046

Figure 4.3 Path model estimates for the hypothetical model with control variables

### 4.4.3 Mediation Effects

Mediation occurs when an independent variable significantly influences a mediator, which in turn, influences a dependent variable (MacKinnon et al., 2002). In order for a variable (ATE or PBC) to be considered a possible mediator of the association between personality and contextual factors (the independent variables) and EI (the dependent variable) two conditions need to be met: (a) Personality or contextual factors must be related to the mediator and (b) the mediator must be related to EI.

As already mentioned, the SEM results indicated that the relationship between risk taking and ATE was not significant. Moreover, no contextual factors, except perceived government support, were significantly related to ATE or PBC. Thus, the first condition was not met for these variables. However, the relationships between the other independent variables and the mediators were significant as were the relationships between the mediators and the dependent variables (Figure 4.2, Table 4.6). Therefore, the two conditions were met. However, the limitation of this method is that the significance of these two direct paths does not provide support for a



significant mediation effect from the independent to the dependent variable via the mediator (Cheung & Lau, 2007). In order to evaluate the significance of the mediation effects in SEM, we used the bootstrap procedures on 1000 samples and bias-corrected confidence intervals (95%) to determine the confidence intervals (Cheung & Lau, 2008; Shrout & Bolger, 2002). The two-tailed significance for the confidence intervals (CIs) provides a test of the standardized estimates for the indirect, direct and total effects (MacKinnon et al., 2004; Preacher & Hayes, 2008). Through the computation of bootstrapped CIs, it is possible to avoid some problems due to asymmetric and other non-normal sampling distributions of an indirect effect (MacKinnon et al., 2004). If zero is not between the lower and upper bound, one can conclude that the indirect effect is significantly different from zero and that mediation is present.

The bootstrapping estimate revealed that the two antecedents in the TPB (ATE and PBC) completely mediate the effects of need for achievement ( $\beta=0.29$ , 95% CI= 0.15 to 0.41), locus of control ( $\beta=0.17$ , 95% CI= 0.05 to 0.30), and risk taking propensity ( $\beta= 0.16$ , 95% CI=0.06 to 0.26) on EI. Nevertheless, the bootstrapping estimate showed that PBC and ATE do not mediate the effects of perceived university support ( $\beta= 0.02$ , 95% CI= -0.09 – 0.12), perceived environmental support ( $\beta= 0.03$ , 95% CI=-0.09–0.20), and perceived government support ( $\beta= 0.03$ , 95% CI=-0.03–0.19) on EI (Table 4.6). As it can be seen in Table 4.6, total effects of personality characteristics on students' EI are greater than contextual factors.

The personality characteristics have a total effect of  $(0.34 + 0.20 + 0.16) = 0.62$ . The context factors show a total effect of  $(0.11 + 0.07 + 0.10) = 0.28$ . . This comparison is limited by the fact that the personality and the context are not entirely covered by the constructs included in the present research. However, for this sample of Iranian students the personality characteristics compared to the contextual factors have a higher effect on entrepreneurial intentions.

**Table 4.6** Direct, indirect, and total effects on entrepreneurial Intention in the Research model and the associated Bootstrapping bias-corrected 95% Confidence Intervals (CI).

Outcome	Determinant	Standardized estimates		
		Direct (95% CI)	Indirect (95% CI)	Total
<b>Entrepreneurial intentions</b>	Attitude	0.29 (0.14 – 0.43)**		0.29**
	Subjective norms	0.14 (0.01– 0.28)*		0.14*
	PBC	0.64 (0.52 – 0.74)**		0.64**
	Need for achievement		0.29 (0.15 – 0.41)**	0.29**
	Risk taking		0.16 (0.06 – 0.26)**	0.16**
	Locus of control		0.17 (0.05 – 0.30)**	0.17**
	Perceived university support	0.10 (0.01-0.20)*	0.01(-0.09 – 0.12)	0.11
	Perceived environmental support		0.07 (-0.09 – 0.20)	0.07
	Perceived government support		0.10 (-0.03 – 0.19)	0.10
<b>Attitudes toward entrepreneurship</b>	Need for achievement	0.25 (0.16 – 0.44)**		0.25**
	Risk taking	0.12 (-0.02 – 0.26)		0.12
	Locus of control	0.25 (0.07– 0.41)**		0.25**
	Perceived university support	0.03 (-0.13-0.05)		0.03
	Perceived environmental support	0.01 (-0.18-0.17)		0.01
	Perceived government support	0.05 (-0.15-0.24)		0.05
<b>Perceived behavioural control</b>	Need for achievement	0.34 (0.08 – 0.47)**		0.34**
	Risk taking	0.20 (0.07 – 0.32)**		0.20**
	Locus of control	0.16 (0.02 – 0.32)*		0.16*
	Perceived environmental support	0.11 (-0.08 – 0.28)		0.11
	Perceived university support	0.03 (-0.11- 0.15)		0.03
	Perceived government support	0.14 (0.01 – 0.17)*		0.14*

Note: The upper and lower bounds of the 95% confidence interval (shown in parentheses) were based on the findings from a bootstrapping analysis using the bias-corrected method

\*\*  $p < 0.01$ , \*  $p < 0.05$ ,

While establishing the mediation effect is important in understanding the underlying mechanisms of causality between independent and dependent variables, estimating the specific indirect effects (in the case of multiple mediators) is of even greater interest. AMOS does not compute bootstrap confidence intervals for specific mediation effects. Therefore, Preacher and Hayes's (2008) SPSS macro was used to calculate the specific indirect effects of personality characteristics and perceived government support on EI through ATE and PBC. This approach also allows for statistical control of covariates and all possible pairwise comparisons between indirect effects. For this mediation model, age, gender, educational level, academic major, and university ranking were entered as control variables.

As shown in Table 4.7, the results indicated that both ATE and PBC were significant mediators between the need for achievement and locus of control and EI. In addition, PBC significantly mediated the effects of risk taking and perceived government support on EI. Examination of the pairwise contrasts of the indirect effects showed that there was no significant difference between the two mediators in the estimation of the effect of need for achievement and locus of control on EI (CIs contained zero). Collectively, hypotheses 4, 6, 7, and 9 were

supported and confirmed full mediation for the two mediators. Moreover, hypotheses 8 and 15 were also supported and confirmed full mediation for PBC. Nevertheless, the results found no support for hypotheses 5, 10, 11, 12, 13, and 14.

**Table 4.7** Mediation effects of role models on EI via ATE, SN, and PBC

	Mediator	Indirect effect (95% CI)	SE
<b>Need for achievement on EI through ATE and PBC (H1 and H4)</b>	ATE	.12 (.07-.20)**	.03
	PBC	.21 (.12-.32)**	.05
	<b>Total</b>	.33 (.22-.47)**	.06
	<i>PBC vs. ATE</i>	.09 (-.02-.20)	.06
<b>Locus of control on EI through ATE and PBC (H3 and H6)</b>	ATE	.11 (.06-.19)**	.03
	PBC	.17 (.08-.29)**	.05
	<b>Total</b>	.29 (.17-.44)**	.07
	<i>PBC vs. ATE</i>	.06 (-.04-.18)	.06
<b>Risk taking on EI through PBC (H5)</b>	PBC	.09 (.03-.16)*	.03
<b>Perceived government support on EI through PBC (H12)</b>	PBC	.10 (.02-.18)*	.04

\*\*  $p < 0.01$ , \*  $p < 0.05$

## 4.5 Discussion

This study incorporated personality characteristics and contextual factors into the TPB and aimed to explore whether attitude and PBC mediated effects of these factors.

The results showed that all three of the proposed TPB antecedents of EI were significant predictors of EI in this study. These direct effects on EI show when being an entrepreneur is perceived to be desirable and attractive, and easy, and family members and other people important to the student are perceived to be supportive, the student is more likely to start their own businesses. These results provide further support to this notion that intention would be formed based on the three motivational antecedents. However, the relative importance of each antecedent in the configuration of intention differed as subjective norms and PBC had the weakest and strongest relationships with EI, respectively. These results confirm the findings of previous studies that SN was the least important predictor of and PBC was the most important predictor of students' EI in the TPB model (e.g., Krueger et al., 2000; Autio *et al.*, 2001; Karimi et al., 2013a).

The proposed model showed that the effects of the selected personality characteristics on entrepreneurial intentions are mediated by attitudes and PBC. In other words, if students have need for achievement and a disposition toward risk and they feel to be able to control what happens in their lives, they do not start up a new business unless they believe in their abilities to do this and perceive it easy to fulfil and desirable and attractive. These findings are in accordance with previous research suggesting that personality factors should be included in social cognition

models of intentions and behaviour (e.g., Conner and Abraham, 2001; Wilkinson and Abraham, 2004), and with studies showing that the antecedents of entrepreneurial intentions in the TPB tend to mediate the effects of personality factors on intentions (e.g., Fini et al., 2012; Obschonka et al., 2010). Among the selected personality characteristics only risk taking did not influence attitude towards entrepreneurship significantly. In the entrepreneurship literature, there is theoretical controversy about the role of risk-taking propensity in entrepreneurship (e.g., Miner & Raju, 2004; Stewart & Roth, 2004). Some studies suggest that the relationship between risk taking and entrepreneurship may be context specific (Zahra, 2005). Some others argue that using different instruments to measure risk taking produces different effect sizes (Rauch & Frese, 2007b). On the other hand, some researchers argue that risk propensity is a weak predictor of entrepreneurial behaviors because individuals have biases in the way they perceive risks given an event (e.g., Karimi et al., 2012). That is, they may choose to take risks because they perceive little risk associated with the activity such as starting a new business (e.g., Busenitz, 1999). In some studies, risk perception, defined as the subjective judgment of the amount of risk inherent in the situation, is accepted as a better predictor than risk propensity of entrepreneurial behaviour (e.g. Keh et al., 2002; Simon et al., 2000). Further research is needed to clarify this point.

Overall, there is evidence to support existing theories and assumptions that distal personality characteristics may be important in the prediction of entrepreneurial outcomes, but they have their effects through more proximal variables such as motivational and cognitive factors (Baron, Frese, & Baum, 2007; Fishbien & Ajzen, 2010; Rauch & Frese, 2007a)

The results also showed that among contextual factors only perceived government supports influenced PBC and none of them influenced attitude towards entrepreneurship. This suggests that perceived contextual supports may have more effect in the decision-making process stage between intention and behaviour. Increasing supports could perhaps help students bridge the gap between their intentions and entrepreneurial behaviour and help them decide to start up a new business. In this stage, individuals are starting to concretely implement entrepreneurial actions and, because they want to implement these actions well in order to make the business succeed, they may be more sensitive to external support (Fini et al., 2012). Another explanation can be that attitude towards entrepreneurship and PBC may be influenced more by supports received by the individual from his/her close environment such as family and friends. Future research should examine the effects of close environment on attitude towards entrepreneurship, address this specific issue and assess the impact of external factors such as perceived support on entrepreneurial behaviours.

The results showed that although perceived university support did not influence PBC and attitude towards entrepreneurship, but it has a direct effect on entrepreneurial intentions. This is

consistent with Franke and Lüthje (2004), Turker and Selcuk (2009), and Schwarz et al. (2009). As mentioned, it was found that perceived government supports had a significant indirect effect on entrepreneurial intentions via PBC. This means if the environmental conditions such as rules and regulations, obtaining loans and credit from banks, and bureaucratic procedures for founding a new business are perceived easy and accessible by students, they would feel more confident in their abilities to start up and manage a new business, which in turn, brings about higher entrepreneurial intentions. As already stated, access to resources such as funds gives an individual the confidence to take a step into uncertain occupations such as entrepreneurship.

## 4.6 Implications

This study has several theoretical and practical implications and offers substantial insights to educators and educational policy makers interested in persuading students and graduates to start their own businesses.

The results of our research contribute to our understanding of students' entrepreneurial intentions in a developing country and more generally highlight the importance of taking contextual factors and aspects of personality into consideration when studying the determinants of entrepreneurial intention. Drawing on models of intention and the TPB, we unveiled some new predictors — both direct and indirect — of the entrepreneurial intentions of students. We did this by carefully incorporating personality and contextual variables into our model to establish a unique and clearly testable model. The model is multidimensional, which means that factors examined in isolation in previous studies can now be analysed in conjunction with each other to determine their joint and independent significance for the prediction of entrepreneurial intentions and the antecedent to these. Our results show that EI is predicted by attitudes toward entrepreneurship, perceived behaviour control and subjective norms. We also assess the mediated effects of personality and contextual factors on EI, showing that EI is primarily explained by personality characteristics.

From a theoretical perspective, our mediation findings support the assertion that external variables such as personality characteristics can indirectly influence entrepreneurial intentions indirectly via its antecedents (Fishbien & Ajzen, 2010). Moreover, these results provide evidence that personality characteristics can be useful determinants of students' perceptions and beliefs. Any theory that ignores the role of personality characteristics is considered incomplete (Herron and Sapienza, 1992; Johnson, 1990). Our results would contribute to the line of entrepreneurship research indicating that personality variables may play an important role in developing theories of the entrepreneurship process such as entrepreneurial intentions (Frank et al., 2007; Rauch & Frese, 2007; Zhao et al., 2005). The present research further added to this growing body of

knowledge by incorporating the distal and proximal variables in examining their role on entrepreneurial outcomes. In particular, our results would also support integration of personality characteristics and socio-cognitive theories such as the TPB and suggest that these theories should acknowledge more explicitly the possibility of indirect effects of personality characteristics on behavioural intentions, and so makes an important contribution to this literature by explicating and testing such mediating relationships.

This study has identified PBC, ATE and SN to be factors important to EI. Therefore, educators and educational policy makers should take into account such factors in educational planning and classroom in order to foster students' EI. PBC clearly contributed the most to the prediction of EI in the present study. The practical implication here is that interventions strategies targeting PBC would certainly improve students' EI and subsequent behaviour. Some studies (e.g., Karimi et al., 2013a) report that entrepreneurship education can enhance students' entrepreneurial self-efficacy or PBC. As already mentioned, self-efficacy can be fostered through vicarious experience (modelling) (Bandura, 1986). Educators should thus consider including entrepreneurial role models as part of their curriculum, because these role models can foster students' confidence in their abilities to start up a new business by providing vicarious experiences for them (Karimi et al., 2013b, c).

According to the findings, the personality characteristics significantly influence students' entrepreneurial intentions through attitudes and perceived behavioral control; hence, educational policy makers and universities should consider these factors when developing programs to foster students' entrepreneurial intentions and behaviours. We suggest university faculties, policy makers and others wishing to enhance entrepreneurial activity should focus first on fostering and developing these characteristics in all students. Some scholars (e.g., McClelland & Winter, 1969; Mirron & McClelland, 1979) claim that entrepreneurial personalities, such as need for achievement and risk taking propensity, are considered to be learned characteristics, which can be changed and developed, to some extent, over time. For example, the results of Hansemark' study (1998) showed that participation in an entrepreneurship course increases need for achievement and internal locus of control. Sánchez (2013) also reported that entrepreneurship education had a positive on students' risk taking propensity.

According to Kirby (2004), most entrepreneurial characteristics can be developed in students, but we cannot develop them by using the traditional teaching methods. We should change not only what is taught but also how it is taught. While in Iranian higher education, the application of content and new pedagogical methods best suited to development of entrepreneurial intentions and competencies is not so prevalent. According to Yaghoubi (2010), for instance, the existing curriculum in higher agricultural education of Iran has not been

successful in developing entrepreneurial competencies in students. He reports that inappropriate teaching methods, inappropriate educational content and syllabus, and an inappropriate evaluation system are the important barriers to entrepreneurship promotion in this sector. Therefore, if the universities wish to foster students' entrepreneurial intentions and competencies, they should use new appropriate pedagogical methods.

In the case of not having budgets sufficient to foster these characteristics in all students and/or in order to avoid misdirecting budgets, it is important to identify students who have higher levels of these personality characteristics and encourage them to take part in entrepreneurship programs. For instance, a university could base its selection process for entrepreneurship courses partly on information, provided by the students, regarding their personality characteristics and entrepreneurship preferences (Luthje & Franke, 2003). Research shows that entrepreneurship education has differential effects on individuals based on their personality characteristics. Fairlie and Holleran (2012) found that individuals who are more risk tolerant benefit more from entrepreneurship training than individuals who are less risk tolerant.

Considering the direct effect of the perceived university supports on EI, universities should more extensively address entrepreneurship education and provide students with the knowledge and skills required to start a new business. They should create an atmosphere that inspires students to develop ideas for new businesses and encourage them to pursue their own ideas. Considering the effect of the perceived government supports on PBC, the government should also provide financial and non-financial support to potential entrepreneurs to increase their confidence towards starting up a new business.

It is worth noting that we did not evaluate the environmental conditions themselves but relied our analysis of the students' subjective judgments. The mean value of the students' perceptions of environmental support is 3.57, of university support is 3.67, and of government support is 2.71, all less than the midpoint of the scales, that is, 4, indicating that the students feel not supported by their environment in terms of creating a new business. Some studies (Karimi et al., 2010) indicate in fact that environmental conditions in Iran are not conducive to entrepreneurship. According to the World Bank report (2012), Iran is ranked 145th among 185 countries with respect to the ease of doing business, and 83rd in ease of getting credit. This index means the regulatory environment is not conducive to the operation of a business. One of the most important reasons for such a ranking is the bureaucratic system, which has too many rules and regulations, and requires too much paperwork. Bureaucracy in Iran is often a very complicated process with endless steps. Regulations, rules and policies change rapidly and are increasingly complicated. The absence of an appropriate entrepreneurial climate, the lack of required infrastructure facilities, and the lack of access to relevant technology, hinder rapid

development in entrepreneurship and business (Karimi et al., 2010). Therefore, policy makers should give the highest priority to providing environmental support and eliminating existing barriers in order to foster the entrepreneurs of the future.

#### **4.7 Limitations and future research**

This study has several limitations. First, the current study was cross-sectional. The findings thus provide only a “snap shot” of the entrepreneurial intentions of higher education students studied in an Iranian context. The direction of causality between the variables in the models used in the study is therefore not certain (Maxwell & Cole, 2007; MacKinnon, Cox, & Baraldi, 2011). It is possible, for example, that a more positive entrepreneurial intention leads to more positive entrepreneurship attitudes which, in turn, lead to higher values for certain personality characteristics. Although our model of entrepreneurial intention has a solid theoretical foundation and the assumption that exogenous variables — such as personality characteristics and contextual factors — shape attitudes and thereby behavioural intentions in the end, is coherent with the literature and other mediation models are theoretically less plausible, we reversed the causal paths within our model. The results showed a better fit for the original model in which it is assumed that personality traits in particular influence entrepreneurial intentions via entrepreneurial attitudes and not vice versa (i.e., entrepreneurial intentions influence entrepreneurial attitudes and thereby some of the exogenous variables included in the model). In addition, since personality traits are considered stable over time (Caliendo et al., 2013), while entrepreneurial intention is variable, it is more likely that the former affects the latter and not vice versa. Longitudinal study is nevertheless needed to trace the influence of personality characteristics and contextual factors and the changes in the components of the TPB and entrepreneurial intentions over time.

Via longitudinal study and thus more than just a “snap shot” of entrepreneurial intentions, the effects of such intentions on the actual occurrence of entrepreneurial behaviour can also be documented. The link between entrepreneurial intention and behaviour is obviously crucial, but it has been studied even less than the link between the antecedents to intention and entrepreneurial intentions. Future research should thus turn to the intention-behaviour link within the entrepreneurial process, which may require a longitudinal approach.

Second, it is recommended that, in addition to replicating the study so as to confirm the findings in other settings, future research should explore the nature and extent of the effects of other personality traits and contextual factors on entrepreneurial intentions. Caliendo and colleagues (2013) argue that both general personality traits, in particular the Big Five, and specific personality characteristics (such as risk taking and need for achievement) might be related to



entrepreneurial tasks. Therefore, future research should study the effects of other personality traits, in particular the Big Five traits within the TPB.

Third, the present model was based on a mediational model whereby distal variables had their effect through more proximal variables and processes. This is based on a sound theoretical rationale (e.g., Fishbein & Ajzen, 2010; Lüthje & Franke, 2003; Rauch & Frese, 2007a). However, alternative moderated relationships are conceivable, whereby for example, personality variables do not necessarily have their effect through more proximal variables, but actually moderate the relationship of these proximal variables and their outcomes. This is an angle that will need to be further investigated in future research.

Another interesting avenue for future study could be to explore the effects of contextual factors and personality characteristics on the link and the time lag between entrepreneurial intentions and entrepreneurial behaviours.

Lastly, the present study was a cross-sectional study, thus we were unable to identify the causal relationships among personality characteristics and contextual factors and entrepreneurial intentions and its antecedents. A longitudinal study is therefore recommended for future research, in order to examine and capture the causal relationships among these variables.

## 4.8 Conclusions

The present study provides researchers with additional information on how personality characteristics and contextual factors influence entrepreneurial intentions and their antecedents within the TPB. The study illustrates that such influences are mediated by perception constructs in the TPB - namely attitudes and perceived behavioural control- in accordance with Ajzen's (1988) theorizing. This means that those interested in intervening would do well to affect the attitude and PBC constructs when attempting to change entrepreneurial intentions in the short term, but they should be mindful that these constructs are also influenced by personality and other external constructs.

To summarize, as a developing country with a high unemployment rate for graduate, Iran must increase its higher education programs' focus on entrepreneurial strategies, content, and pedagogical methods and must develop an entrepreneurial climate and culture in universities and in society. Furthermore, Iran must create stable economic and political conditions more favourable to entrepreneurial activities. Such measures can help to transform university graduates from job seekers into job creators and improve Iran's economy. While enacting these recommendations, however, it must be recognized that it is difficult to stimulate relevant environments in the short term, either within or outside universities. Furthermore, as the present study shows, the effect of personality traits on entrepreneurial attitudes and intentions was

stronger than that of environmental factors. As a result, personality characteristics gain a higher status; the stronger the personality characteristics, the less likely an unfavourable external environment will affect entrepreneurial perceptions and attitudes (Frank et al., 2007). Policy makers and educators should take this valuable insight into account when developing and delivering entrepreneurship education to foster the entrepreneurial mind-set of individuals.

# Chapter 5

## Effects of Entrepreneurship Education on Entrepreneurial Intentions

This chapter is based on:

Karimi, S., Biemans, H. J. A., Lans, T., Chizari, M., & Mulder, M. (in press). The Impact of Entrepreneurship Education: A Study of Iranian Students' Entrepreneurial Intentions and Opportunity Identification. *Journal of Small Business Management*.

## Abstract

Building on the theory of planned behaviour, an ex-ante and ex-post survey was used to assess the impacts of elective and compulsory entrepreneurship education programs (EEPs) on students' entrepreneurial attitudes and intention. Data were collected by questionnaire from a sample of 205 participants in EEPs at six Iranian universities. Structural equation modelling and paired and independent samples t-tests were used to analyse data. Both types of EEPs had significant positive impacts on students' subjective norms and perceived behavioural control. Results also indicated that the elective EEPs significantly increased students' entrepreneurial intention, although this increase was not significant for the compulsory EEPs. The findings contribute to the theory of planned behaviour and have implications for the design and delivery of EEPs.

## 5.1 Introduction

During the past few decades, entrepreneurship has become an important economic and social topic as well as an often-researched subject around the world (Fayolle & Gailly, 2008). According to research, entrepreneurship is an intentional and planned behaviour that can increase economic efficiency, bring innovation to markets, create new jobs and raise employment levels (Shane & Venkataraman, 2000). Most empirical studies indicate that entrepreneurship, or at least some aspects of it, can be taught and that education can be considered one of the key instruments for fostering entrepreneurial attitudes, intentions, and competences (Falkang & Alberti, 2000; Harris & Gibson, 2008; Henry et al., 2005; Kuratko, 2005; Martin, McNally, & Kay, 2013; Mitra & Matlay, 2004). This view has led to a dramatic rise in the number and status of entrepreneurship education programs (EEPs) in colleges and universities worldwide (Finkle & Deeds, 2001; Katz, 2003; Kuratko, 2005; Matlay, 2005); investment in these programs is still on the increase (Gwynne, 2008). Nevertheless, the impact of these programs has remained largely unexplored (Bechard & Gregoire, 2005; Peterman & Kennedy, 2003; Pittaway & Cope, 2007; von Graevenitz, Harhoff, & Weber, 2010). Moreover, the results of previous studies are inconsistent. Some of these studies reported a positive impact from EEPs (e.g., Athayde, 2009; Fayolle, Gailly, & Lassas-Clerc, 2006; Peterman & Kennedy, 2003; Souitaris, Zerbinati, and Al-Laham, 2007), while others found evidence that the effects are statistically insignificant or even negative (Oosterbeek, van Praag, & Ijsselstein, 2010; Mentoor & Friedrich, 2007; von Graevenitz, et al., 2010).

Methodological limitations may be the cause of these inconsistent results (von Graevenitz, et al., 2010). Some studies, for instance, are ex-post examinations that do not measure the direct impact of an entrepreneurship education program (e.g., Kolvereid & Moen, 1997; Menzies & Paradi, 2003), or have small samples (e.g., Fayolle et al., 2006; Jones et al., 2008). And many researchers have therefore called for the more systematic evaluation of entrepreneurship

education programmes (e.g., Fayolle et al., 2006; von Graevenitz et al., 2010). Martin et al. (2013) also suggested that entrepreneurship education researchers must include pre- and post-entrepreneurship interventions. However, little agreement can be found on the most suitable conceptual model and best methods to assess the effects of entrepreneurship education programmes (Falkang & Alberti, 2000; von Graevenitz et al., 2010). Moreover, in previous studies, participation in elective versus compulsory programmes has not been distinguished (Oosterbeek et al., 2010). In addition, non-business students have received limited attention in previous studies (Lans et al., 2013); this is despite the fact that non-business students represent the bulk of young people pursuing entrepreneurship education programmes. All of the other published research on the effects of entrepreneurship education programmes has — to the best of our knowledge — been conducted in developed countries, moreover (e.g., Fayolle & Gailly, 2013; Oosterbeek et al., 2010; Peterman & Kennedy, 2003; Souitaris et al., 2007; von Graevenitz et al., 2010; Volery et al., 2013; Weber, 2012).

The present study has attempted to reduce these theoretical and methodological gaps and make four contributions to the existing literature. First, we applied an intention model to assess the impact of EEPs. As a second contribution, we studied the effects of large-scale compulsory and elective entrepreneurship courses at different universities. The third contribution is our use of a pre-test plus post-test design to study these effects. And the fourth contribution is to assess the effect of entrepreneurship education on non-business university students in a developing country, namely Iran.

This paper is organized as follows. In the next section we explain entrepreneurial intentions and the theory of planned behaviour. We then discuss the relationships between intentions and their antecedents, and point out how EEPs may affect these factors. Next we describe the method and findings. Finally, we discuss our results and their implications both for the practice of entrepreneurship education and for future research.

## **5.2 Theoretical Framework**

### **5.2.1 Entrepreneurial Intentions**

In the social psychology literature, intentions have proved to be the best predictor of planned individual behaviours, especially when the target behaviour is rare, difficult to observe, or involves unpredictable time lags (Krueger et al., 2000). Entrepreneurship is a typical example of such planned and intentional behaviour (Bird, 1988; Krueger & Brazeal, 1994). Entrepreneurial intention (EI) refers to the intention of an individual to start a new business. In other words, entrepreneurial intention is 'a 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' (Thompson, 2009, p. 676). There is a vast body of literature arguing that EI plays a very pertinent role in the decision to start a new business (Linan & Chen, 2009). As a consequence, in recent years, employment status choice models that focus on EI have been the subject of considerable interest in entrepreneurship research (e.g., Engle et al., 2010; Iakovleva et al., 2011; Karimi et al., forthcoming). Krueger et al. (2000) found that intention models offer a great opportunity to increase our understanding and predictive ability for entrepreneurship.

### 5.2.2 The Theory of Planned Behaviour

Among intention models, one of the most widely researched is the theory of planned behaviour (TPB), originally presented by Ajzen (1991). This model has been widely applied in entrepreneurship research, and its efficacy and ability to predict EI and behaviours have been demonstrated in a number of studies on entrepreneurship (e.g., Karimi et al., forthcoming; Kolvereid & Isaksen, 2006). The central factor of the TPB is the individual intention to perform a given behaviour (e.g., the intention to become an entrepreneur). Consequently, the model stresses that intention is affected by three components or antecedents (Ajzen, 1991): (1) Subjective Norms (SN), referring to perceived social pressures to perform or refrain from a particular behaviour (e.g., becoming an entrepreneur); (2) Attitudes toward the behaviour, that is, the degree to which a person has a favourable or unfavourable evaluation about performing the target behaviour (e.g., being an entrepreneur); and (3) Perceived Behavioural Control (PBC), that is, the perceived difficulty or ease of performing the behaviour (e.g., becoming an entrepreneur). PBC is conceptually similar to perceived self-efficacy as proposed by Bandura (1997). In both concepts, the sense of capacity to perform the activity is important (Ajzen, 2002).

### 5.2.3 Hypotheses

Researchers have empirically applied the TPB to students' EI and confirmed the theory's predictions regarding the effects of SN, PBC, and attitude towards entrepreneurship (ATE) on their intentions (e.g., Engle et al., 2010; Linan & Chen, 2009; Iakovleva, Kolvereid, & Stephan, 2011). However, these findings as a whole do not represent a conclusive and consistent picture. Linan and Chen (2009) tested the TPB among university students in Spain and Taiwan. Their results showed that both ATE and PBC had significant effects on EI; however, PBC was the strongest predictor of EI in Taiwan, while in Spain, ATE was the strongest predictor of EI. Even though SN had no significant direct effect on intention, SN indirectly affected intention through ATE and PBC. Engle et al. (2010) tested the ability of the TPB to predict EI in 12 countries. The results suggested that the TPB model successfully predicted EI in each of the study countries, although, as foreseen

by Ajzen and illustrated above in empirical work, the significant contributing model elements differ among countries. Engle et al. (2010) reported that SN was a significant predictor of EI in every country, while ATE was a significant predictor in only six countries (China, Finland, Ghana, Russia, Sweden, and the U.S.) and PBC was a significant predictor in only seven countries (Bangladesh, Egypt, Finland, France, Germany, Russia, and Spain). Finally, Iakovleva et al. (2011) used the TPB to predict EI among students in five developing and eight developed countries. The findings provided support for the applicability of the TPB in both developing and developed countries. They found the three antecedents to be significantly related to EI in all 13 countries. In sum, these findings together support Ajzen's (1991) assertion that all three antecedents are important, although their explanatory power is not the same in every situation and country. Therefore, it is hypothesized that:

**H1:** (a) SN (b) ATE, and (c) PBC are positively related to university students' EI.

#### 5.2.4 Entrepreneurship Education

Entrepreneurial education is a rapidly growing area and a hot topic in colleges and universities all around the world and its supposed benefits have received much praise from researchers and educators. Nevertheless, the outcomes and effectiveness of EEPs have remained largely untested (Pittway and Cope 2007; von Graevenitz et al. 2010). According to Alberti et al. (2004), the first and most important area for further investigation should include assessing the effectiveness of these programs. However, this raises an important question: How should entrepreneurship education be assessed? One of the most common ways to evaluate an EEP is to assess individuals' intentions to start a new business. Intentionality is central to the process of entrepreneurship (Bird 1988; Krueger 1993), and studies show that entrepreneurial intention is a strong predictor of entrepreneurial behaviour. Nonetheless, the impact of EEPs on EI to set up a business is at present poorly understood and has remained relatively untested (Athayde, 2009; Souitaris et al., 2007; Peterman & Kennedy, 2003; von Graevenitz et al., 2010).

According to Fishbein and Ajzen (2010), the TPB can serve not only to gain a better understanding of determinants of behavioural intentions and behaviour and to design an intervention guided by that understanding but it also can be used as a suitable conceptual and methodological framework to evaluate the educational interventions. Several entrepreneurship scholars (e.g., Fayolle et al., 2006; Fayolle & Gailly, 2013; Weber, 2012) also suggest that the TPB is appropriate for the evaluation of EEPs such as entrepreneurship courses. The main purpose of such an intervention is to bring about a change in students' entrepreneurial attitudes and intentions, and the TPB promises to deliver a sound framework for assessing this change systematically. The TPB has been empirically used by some researchers to assess the impact of

EEPs on the students' EI, and its value has been successfully demonstrated (Fayolle et al., 2006; Souitaris et al., 2007). As such, the TPB is considered to provide a useful framework for both analysing how EEPs might influence students with regard to their EI and, in particular, for defining and measuring relevant criteria.

#### **5.2.4.1 Entrepreneurship Education Effects on Entrepreneurial Intentions**

Krueger and Carsrud (1993) were the first to apply the TPB in the specific context of entrepreneurship education. They pointed out that an education program can have an impact on the antecedents of intention identified by the TPB. Fayolle et al. (2006) found that while entrepreneurship education has a strong and measurable effect on students' EI, it has a positive, but not very significant, impact on their PBC. Souitaris et al. (2007) used the TPB in order to test the impact of EEPs on the attitudes and intentions of science and engineering students. They found that EEPs significantly increased students' EI and subjective norms. However, they did not find a significant relationship between EEPs and attitudes and PBC, whereas Peterman and Kennedy (2003) and Athayde (2009) found a positive effect of EEPs on intentions and perceived feasibility, or ATE, among high-school students. Walter and Dohse (2012) reported that EEPs were positively related only to ATE, not to SN or PBC. Results regarding entrepreneurship education initiatives are therefore somewhat inconclusive, and more detailed research is needed to get a full understanding of the relationship between entrepreneurship education and attitudes/intentions. Notably, in their recent meta-analysis Martin and his colleagues (2013) found overall positive effects of EEPs on knowledge and skill, perceptions of entrepreneurship, and entrepreneurship outcomes. Thus we propose that:

**H2:** *Students who have followed an EEP will have higher (a) SN, (b) ATE, (c) PBC, and (d) EI after the program than before the program.*

**H2e:** *Students whose SN, ATE, and PBC have increased will also have increased their EI.*

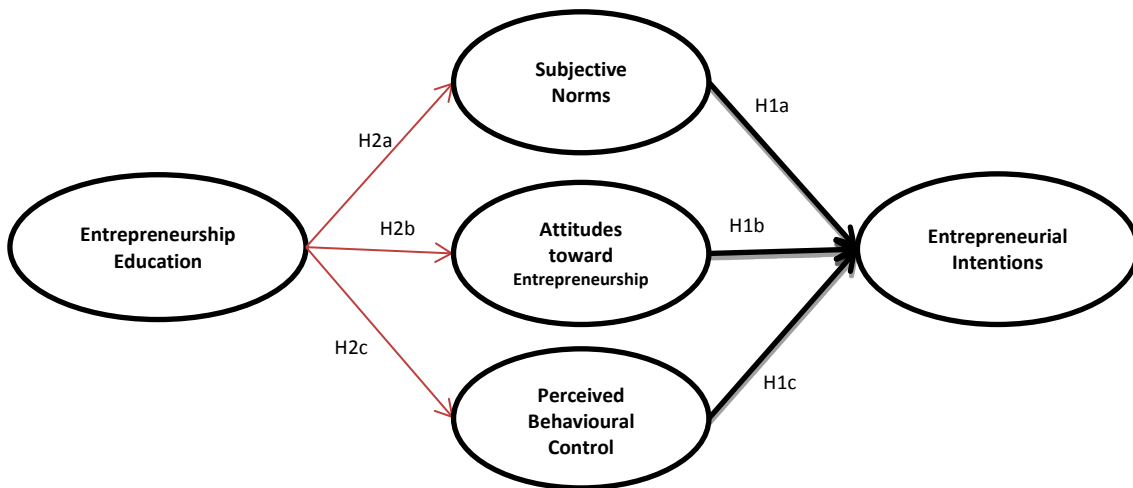
#### **5.2.4.2 Elective versus Compulsory Entrepreneurship Education**

As already mentioned, empirical studies have yielded mixed results about the effects of EEPs on entrepreneurship. Oosterbeek et al. (2010) and von Graevenitz et al. (2010) found that the EEPs had a negative impact on EI. Both studies examined compulsory EEPs. Oosterbeek et al. (2010) argued that the effects of EEPs may have been negative because participation in EEPs was compulsory. In this study, we assess the effects of two types of EEPs (voluntary, or elective, and compulsory EEPs) on students' EI. Compulsory programs are given to every student enrolled in a certain degree program; therefore, they include both those interested and those uninterested in entrepreneurial activity and education. However, participants in elective EEPs have an interest in entrepreneurship education, and seek out further knowledge and skills in entrepreneurship.



Moreover, motivated students will more actively participate in learning activities than students forced to take the course. Therefore, we can expect that an elective EEP has a greater influence on participants, than does a compulsory one.

**H3:** *An elective EEP will have a greater effect on students' ATE, SN, PBC, and EI, compared with a compulsory EEP.*



**Figure 5.1** The proposed research model

## 5.3 Research Method

### 5.3.1 Entrepreneurship Education Programs

Over the past decades, many developing countries including Iran have faced various economic problems, in particular the excessive number of university graduates unable to find government or private sector work opportunities. Over the last decade, Iran has expressed increasing interest in various entrepreneurship fields (in higher education settings, policy-making, and business) as a fundamental solution for the unemployment problem and improving the economy. The government is spending more than ever to promote and encourage entrepreneurship and innovation. Accordingly, measures and mechanisms have been proposed to develop entrepreneurship in the public and private sectors as well as in universities. The first official step was taken in 2000 with the establishment of a comprehensive program for entrepreneurship development in universities, called KARAD, as part of the Third Economic and Social Development Program. The main goal of KARAD was to promote an entrepreneurial spirit and culture in academic communities and familiarize students with entrepreneurship as a career choice; specific facets aimed to encourage and train them on how to prepare a business plan, and to start and manage a new business. To achieve this goal, several programs and strategies were considered

including establishing entrepreneurship centres and introducing entrepreneurship courses such as “Fundamentals of Entrepreneurship” into undergraduate education (Karimi et al., 2010).

“Fundamentals of Entrepreneurship” as a compulsory or elective course is taught to undergraduate students in their last two years of college in various faculties/departments. It aims to increase university graduates’ knowledge about entrepreneurship, influencing their entrepreneurial attitudes and intentions, and encourage them to be job creators rather than job seekers. According to Linan’s (2004) EEP categorization, these criteria allow the course in which this study’s survey was conducted to be classified in the category of “Entrepreneurial Awareness Education.” Although the course description is almost the same at every university, educators might use various teaching materials and methods for this course. The methods most often employed are lectures, readings, class discussion, business plans, case studies, and guest speakers.

### **5.3.2 Participants and procedures**

During the 2010-2011 academic year, an ex-ante and ex-post survey was used to measure the change in students’ entrepreneurial attitudes and intentions over approximately a 4-month period in “Fundamentals of Entrepreneurship” courses at six Iranian universities. Our research used a quantitative method, including a questionnaire that was handed out at the beginning of the first session (t1) and at the end of the final session (t2) of the courses. Undergraduate students who enrolled in the entrepreneurship courses at six Iranian public universities served as the sample for the study (n=320). The reason for including several different universities was the objective of covering a wide range of different class characteristics and of different rankings of Iranian universities. As not all the students in the university were allowed to take entrepreneurship courses, respondents for our questionnaire were selected on a purposive basis. The students surveyed were told that the questionnaires were for research purposes only and that their answers would not affect their curriculum in any way; participation was always presented as a voluntary choice. In the first survey (t1), 275 students participated (response rate of 86 percent) and in the second survey (t2), 240 students (response rate of 75 percent). We were able to match the two questionnaires (at t1 and at t2) for 205 students. These represent 64 percent of total enrolment in the entrepreneurship courses at the selected universities. The sample consisted of 86 male students (42 percent) and 119 female students (58 percent), with ages ranging from 19 to 31, with a mean of 22.08 years. There is a greater proportion of females in the sample because more females than males enrol in the degrees where the data were collected. There was no control group; only students participating in the course filled out the two questionnaires. In general terms, the breakdown of the sample according to college major is:

Agricultural Sciences (49.8 percent), Engineering Sciences (21.5 percent), Humanistic Science (21.5 percent), and Basic Sciences (7.2 percent).

### 5.3.3 Measurement of Variables

All construct measures were adopted from existing scales. All items (aside from demographic characteristics) were measured using a seven-point Likert scale ranging from “1”, representing “strongly disagree”, to “7”, representing “strongly agree”. These items and the sources from which the items were adopted are summarized in Table 5.1. Several control variables were used in the study: age, gender (coded as 1=male and 0= female), university ranking (coded as 3=high ranking, 2=intermediate ranking and 1=low ranking), university (categorical variable for the 6 selected universities), and academic major (categorical variable for the 4 academic majors).

**Table 5.1** Details, Reliability and Validity of the Measures

Construct	Research reference	No of Item	α		CR		AVE	
			Pre	Post	Pre	Post	Pre	Post
Entrepreneurial Intentions	Linan and Chen (2009), e.g., "I have very seriously thought of starting a firm"	6	0.84	0.85	0.89	0.90	0.50	0.52
Attitudes toward Entrepreneurship	Linan and Chen (2009), e.g., "Being an entrepreneur implies more advantages than disadvantages to me".	5	0.78	0.85	0.86	0.91	0.55	0.66
Subjective Norms	Adopted from Kolvereid (1996b), which has been used in Kolvereid and Isakson (2006); Krueger et al. (2000) and Souitaris et al. (2007). This scale included two separate questions: belief (e.g., "I believe that my closest family thinks that I should start my own business") and motivation to comply (e.g., "I care about my closest family's opinion with regard to me starting my own business"). The belief items were recoded into a bipolar scale (from -3 to +3) and multiplied with the respective motivation-to-comply items. The subjective norm variable was calculated by adding the three results and dividing the total score by three. Linan and Chen (2009); e.g., "Starting a firm and keeping it viable would be easy for me."	6	0.82	0.91	0.90	0.95	0.58	0.74
Perceived Behavioural Control		6	0.88	0.88	0.93	0.93	0.60	0.61

**Table 5.2** The Correlation Matrix and Discriminant Validity

Variable	Mean	SD	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1 EI (t1)	4.85	1.43	<b>(.71)</b>														
2 ATE (t1)	5.13	.953	.33**	<b>(.74)</b>													
3 SN (t1)	2.25	5.67	.36**	.11	<b>(.76)</b>												
4 PBC (t1)	4.35	1.32	.60**	.21**	.24**	<b>(.77)</b>											
5 EI (t2)	5.06	1.31	.47**	.13	.25**	.31**	<b>(.72)</b>										
6 ATE (t2)	5.22	1.04	.25**	.32**	.16*	.17*	.57**	<b>(.81)</b>									
7 SN (t2)	4.07	7.07	.24**	.13	.34**	.17*	.43**	.30**	<b>(.86)</b>								
8 PBC (t2)	4.68	1.27	.38**	.12	.09	.40**	.67**	.47**	.42**	<b>(.78)</b>							
9 EI (t2-t1)	.213	1.66	-.57**	-.21*	-.13	-.32**	.46**	.28**	.16*	.24**							
10 ATE (t2-t1)	.083	1.31	-.05	-.54**	.06	-.02	.40**	.64**	.16*	.32**	.42**						
11 SN (t2-t1)	1.82	7.86	-.04	.05	-.44**	-.02	.22**	.16*	.69**	.33**	.25**	.10					
12 PBC (t2-t1)	.337	1.65	-.22**	-.09	-.14*	-.57**	.32**	.26**	.22**	.53**	.52**	.35**	.32**				
13 Age	22.08	1.72	.15*	.11	.02	.07	.08	-.03	.05	.06	-.07	-.10	.03	-.02			
14 Gender	.42	.49	.06	-.22**	-.07	.08	-.09	-.08	-.04	-.01	-.12	.10	.02	-.07	.05		
15 Selection	.37	.46	.04	.09	.02	.11	.22**	.07	.08	.13	.14*	-.02	.07	.02	-.30**	-.20*	
16 Ranking	2.14	.92	-.09	-.03	-.01	-.06	.15*	.03	.11	.24*	.10	.04	.11	.10	-.22**	-.06	.22**

Note: n=205; Two-tailed tests of significance were used, \*\*P<0.01, \*P<0.05; EI= Entrepreneurial Intention, SN= Subjective Norms, ATE= Attitude toward Entrepreneurship, PBC= Perceived Behavioural Control.

### 5.3.4 Statistical Analysis

The obtained data were analysed using SPSS 18 and AMOS 18. As a first step, an Exploratory Factor Analysis (EFA) was performed on the items. EFA helps explain the variability among observable variables and thus served to eliminate problematic items with significant cross-loadings or loading to the wrong factor; items remaining after this filtering exercise were selected to build each of the constructs used in the structural equation modelling in the second step. Structural Equation Modelling (SEM) was employed to define the relationship between EI and its antecedents (hypothesis 1). Furthermore, the paired samples t-test was used to test the impact of the programs on the students' entrepreneurial attitudes and intentions, (hypothesis 2). Finally, the independent samples t-test was utilized to compare the effects of elective and compulsory courses (hypothesis 3).

## 5.4 Results

### 5.4.1 Structural Equation Modelling

The Structural Equation Modelling (SEM) approach was used to validate the research model and test the effects in the hypotheses. According to Hair et al. (2006), it is appropriate to adopt a two-step approach in SEM: (a) the assessment of the measurement model, (b) and the assessment of the structural model.

#### 5.4.1.1 Assessment of the Measurement Model

The first step, involving Confirmatory Factor Analysis (CFA), was to test the goodness-of-fit indices, and the reliability and validity of the proposed measurement model. The measurement model includes 23 items describing five latent constructs: ATE, SN, PBC, and EI. Goodness-of-fit indicators suggest a very good fit of the proposed model for the pre-test ( $\chi^2= 284.432$ ,  $p=0.001$ ;  $\chi^2/df= 1.323$ ;  $GFI=0.893$ ;  $TLI=0.962$ ;  $CFI=0.968$ ;  $IFI= 0.968$ ;  $RMSEA= 0.04$ ) and post-test data ( $\chi^2= 278.022$ ,  $p=0.003$ ;  $\chi^2/df= 1.287$ ;  $GFI=0.898$ ;  $TLI=0.972$ ;  $CFI=0.976$ ;  $IFI= 0.977$ ;  $RMSEA= 0.038$ ). Therefore, on the basis of the results obtained, the hypothesized model of five constructs is a suitable measurement model for this study.

The convergent and discriminant validities of the constructs can be assessed by referring to the measurement model. According to Fornell and Larcker (1981), convergent validity is evaluated for the measurement model based on three criteria: (1) factor loadings; (2) the scale composite or construct reliability (CR); and (3) the average variance extracted (AVE). The findings showed that all items' critical ratio values exceed 6.117 ( $p < 0.01$ ) and all loadings are more than 0.5. Moreover, all constructs had a CR value, ranging from 0.86 to 0.95, higher than the

recommended level of 0.70. With respect to the AVE estimate, the results revealed that the AVE estimate for all constructs is above or close to the recommended threshold of 0.50 (Table 5.1). Discriminant validity was assessed by comparing the square root of the AVE for a given construct with the correlations between that construct and all other constructs. The square roots of the AVE of each construct, listed on the diagonal of Table 5.2, all exceed the correlation shared between the construct and other constructs in the model, indicating adequate discriminant validity between each construct.

#### **5.4.1.2 Assessment of the Structural Model**

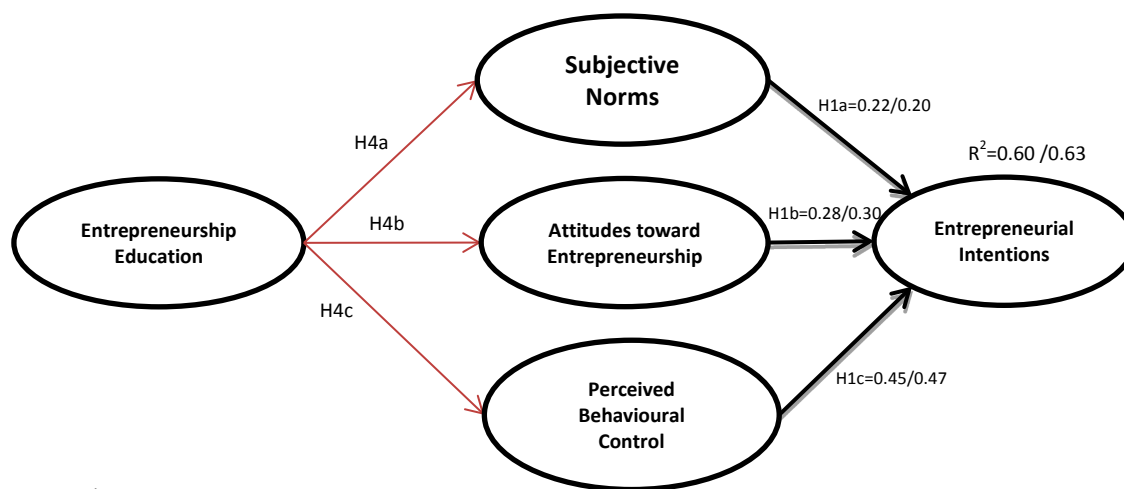
With the construct validity and reliability measures established, all the constructs were used as input to form a structural model representing the hypothesized model depicted in Fig. 1. As shown in Figure 5.2, the overall goodness-of-fit statistics show that the structural model fits the pretest and post-test data well. Having assessed the fit indices for the measurement models and structural models, the estimated coefficients of the causal relationships between constructs were examined. Table 5.3 shows the coefficient of each hypothesized path and its corresponding critical ratio (CR; known as the *t*-value). It can be seen from this table that the predictive positive effect of SN on EI is supported (pre-test:  $\beta=.22$ ,  $CR=3.299$ ,  $p<0.001$ ; post-test:  $\beta=.20$ ,  $CR=3.056$ ,  $p<0.01$ ), an effect which corresponds to H1a. H1b is also supported: that ATE has a positive effect on EI (pre-test:  $\beta=.28$ ,  $CR=3.969$ ,  $p<.001$ ; post-test:  $\beta=.30$ ,  $CR=4.078$ ,  $p<0.001$ ). As the PBC also has a significant effect on EI (pre-test:  $\beta=.45$ ,  $CR=5.684$ ,  $p<0.001$ ; post-test:  $\beta=0.47$ ,  $CR=5.212$ ,  $p<0.001$ ), H1c is supported. Overall, the TPB model explained respectively 60 and 63 percent of the variance in the EI in the pre-test and post-test samples ( $R^2_{pretest}=0.60$ ;  $R^2_{post-test}=0.63$ ). To test the relationships between the control variables and the change in ATE, SN, PBC, and EI, a correlation and a general linear model (GLM) procedure were employed. The results of correlation indicated that age, gender, and university ranking did not have significant correlations with the difference values of ATE, SN, PBC, and EI (Table 5.2). The GLM results also showed no significant differences in ATE, SN, PBC, and EI, controlling for the categorical variables (university and academic major), suggesting that the findings of this study were not affected by these control variables. In order to test hypothesis 4e, we employed a correlation analysis, as summarized in Table 5.2. As expected, a change in SN, ATE, and PBC was significantly related to an increased intention to start one's own business. Therefore, hypothesis 2e was accepted.

**Table 5.3** Results of the structural equation modelling

Hypotheses Tested		Estimate ( $\beta$ value)	S.E. <sup>a</sup>	C.R. <sup>b</sup> (t-value)	P
<b>Model at time1</b>					
H1a: Subjective norm	→ Entrepreneurial Intention	0.22	0.014	3.299	0.000**
H1b: Attitude towards entrepreneurship	→ Entrepreneurial Intention	0.28	0.191	3.969	0.000**
H1c: Perceived behavioural control	→ Entrepreneurial Intention	0.45	0.071	5.684	0.000**
<b>Model at time2</b>					
H1a: Subjective norm	→ Entrepreneurial Intention	0.20	0.012	3.056	0.002**
H1b: Attitude towards entrepreneurship	→ Entrepreneurial Intention	0.30	0.084	4.078	0.000**
H1c: Perceived behavioural control	→ Entrepreneurial Intention	0.47	0.096	5.212	0.000**

<sup>a</sup> S.E. is an estimate of the standard error of the covariance.

<sup>b</sup> C.R. is the critical ratio obtained by dividing the covariance estimate by its standard error. \*\* $P < 0.01$ , \* $P < 0.05$



Pre-test/Post-test

**Goodness-of-fit indices (Pretest):**  $\chi^2=284.862$ ;  $\chi^2/df=1.319$ ; GFI=0.893; TLI=0.963; CFI=0.968; IFI=0.969; RMSEA=0.040

**Goodness-of-fit indices (Post-test):**  $\chi^2=278.125$ ;  $\chi^2/df=1.282$ ; GFI=0.897; TLI=0.973; CFI=0.977; IFI=0.977; RMSEA=0.037

**Figure 5.2** The proposed research model

### 5.4.2 Impact of EEPs on Students

In order to assess the impacts of the entrepreneurship courses on the students' entrepreneurial attitudes and intentions, we conducted the paired samples t-test. Table 5.4 summarizes the results of this test. The results showed a positive and significant difference in the pre-test ( $M=2.25$ ) and post-test value ( $M=4.08$ ) of SN ( $t=3.28$ ,  $p=0.001 < 0.01$ ). The significant difference between the pre-test ( $M=4.35$ ) and post-test data ( $M=4.68$ ) was also evident for PBC ( $t=2.92$ ,  $p=0.004 < 0.01$ ). However, the mean score of ATE in the pre-test sample ( $M=5.13$ ) was not significantly different from the mean score in the post-test sample ( $M=5.22$ ) ( $t=0.904$ ,  $p=0.367 > 0.05$ ). The results also revealed that the post-test value of EI ( $M=5.06$ ) was increased compared to the pre-test value ( $M=4.851$ ), though this increase was not very significant ( $t=1.83$ ,  $p=0.068 > 0.05$ ). The GLM procedure of ANOVA also indicated significant differences between the pre- and post-test values for SN ( $F=10.77$ ,  $p=0.001$ ) and PBC ( $F=8.51$ ,  $p=0.004$ ), but not for EI, and ATE. The

results therefore demonstrate that there are positive and significant differences in pre- and post-test values of SN and PBC, confirming H2a and H2c; however, there are no significant differences in pre- and post-test values of ATE and EI, rejecting H2b and H2d.

**Table 5.4** Results of paired t-test for the program impacts (N = 205)

Scale	Pre-test		Post-test		Difference	
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>t</i> (204)	<i>p</i>
<b>EI</b>	4.85	1.43	5.06	1.32	1.83	0.068
<b>SN</b>	2.25	5.67	4.08	7.07	3.28	0.001*
<b>ATE</b>	5.13	0.95	5.22	1.04	0.90	0.367
<b>PBC</b>	4.35	1.32	4.68	1.28	2.92	0.004*

EI=Entrepreneurial Intentions; ATE=Attitudes toward Entrepreneurship; SN=Subjective Norms; PBC=Perceived Behavioural Control  
\*P<0.01

### 5.4.3 Differences in EEP Impacts in relation to the Selection Mode

In order to examine whether attitudes and intentions change are equally likely for the two types of EEPs (elective versus compulsory), we compared the effects of these different programs by using the independent samples t-test. For each student, a gain score was calculated for each of the five scales, which consisted of the student's score on the scale in the post-test survey minus his/her score on the same scale in the pre-test survey. As can be seen in Table 5.5, in the pre-test sample, the students in elective courses exhibited higher scores on all five scales compared to the students in compulsory courses, but none of these differences is statistically significant. In the post-test sample, the two groups differed significantly in their EI, such that the students in the elective courses have greater EI than the students in the compulsory courses. The elective courses had a significantly greater positive impact on the students' EI, as the gain in EI was significantly higher for the students in the elective courses than for the students in the compulsory courses. The results of the paired samples t-test (Table 5.6) also showed significant differences in pre- and post-values of EI, SN, and PBC for the elective courses, but for the compulsory courses they showed significant differences only in pre- and post-values of SN and PBC.



**Table 5.5** Differences in the EEP impacts according to selection mode (Compulsory vs. Elective)

Scale	Pre-test					Post-test					Gain						
	Compulsory (N=127)		Elective (N=78)		Difference t(203)	Compulsory (N=127)		Elective (N=78)		Difference t(203)	Compulsory (N=127)		Elective (N=78)		Difference t(203)	P	
	M	SD	M	SD		M	SD	M	SD		M	SD	M	SD			
EI	4.80	1.39	4.93	1.50	-0.59	0.550	4.84	1.33	5.44	1.22	-3.23	0.001*	0.03	1.67	1.59	-2.01	0.046*
SN	2.19	5.77	2.35	5.53	-0.19	0.844	3.65	4.06	4.77	7.08	-1.10	0.272	1.46	8.21	7.54	-0.84	0.403
ATE	5.07	0.96	5.24	0.93	-1.25	0.212	5.16	1.04	5.31	1.04	-1.05	0.297	0.09	1.32	1.32	0.08	0.938
PBC	4.24	1.27	4.52	1.39	-1.52	0.131	4.55	1.28	4.89	1.25	-1.84	0.068	0.32	1.70	1.57	-0.20	0.839

\*\**p*<0.01, \**p*<0.05; EI=Entrepreneurial Intentions; ATE=Attitudes toward Entrepreneurship; SN=Subjective Norms; PBC=Perceived Behavioural Control

**Table 5.6** Results of Paired t-test for the impacts of Elective and Compulsory Programs

Scale	Compulsory (N=127)				Elective (N=78)							
	Pre-test M	SD	Difference t	p	Pre-test M	SD	Difference t	p				
EI	4.80	1.39	4.84	1.33	0.21	0.833	4.93	1.50	5.44	1.22	2.80	0.006**
SN	2.19	5.78	3.65	7.06	2.00	.047*	2.35	5.53	4.77	7.08	2.83	0.006**
ATE	5.07	0.96	5.16	1.04	0.76	0.450	5.24	0.93	5.31	1.01	0.49	0.622
PBC	4.24	1.27	4.55	1.28	2.10	0.037*	4.52	1.39	4.89	1.25	2.06	0.043*

\*\**p*<0.01, \**p*<0.05; EI=Entrepreneurial Intentions; ATE=Attitudes toward Entrepreneurship; SN=Subjective Norms; PBC=Perceived Behavioural Control

## 5.5 Discussion

The purpose of this study was to assess the impact of entrepreneurship education on students' entrepreneurial attitudes and intentions, drawing on the theory of planned behaviour. To address this purpose, we employed an ex-ante and ex-post survey, with 205 participants in elective and compulsory courses at six Iranian public universities.

The findings were in line with earlier studies on the effects of EEPs, but nevertheless also present some differences. We found confirmation for the impact of (both types of) EEPs on SN (Souitaris et al., 2007; Weber, 2012). For both voluntary and compulsory EEPs, the post-program mean value of PBC was increased in relation to the pre-program value (Peterman & Kennedy 2003; Weber 2012), something that Souitaris and colleagues (2007) were not able to confirm. However, this study did not provide evidence that EEPs have a significant effect on students' EI in the sample as a whole. This conflicts with the idea that participating in EEPs fosters individuals' intentions to start a new business (Souitaris et al., 2007). Notably, the comparison of elective and compulsory EEPs indicated that intention change is not equally distributed across these programs. The elective EEPs had a significantly greater positive impact on students' entrepreneurial intention. Moreover, this study could not find a significant effect of either elective or compulsory EEPs on ATE: the programs failed in developing students' ATE. This finding is in line with the results of Souitaris et al. (2007) and Weber (2012), but it is not consistent with the findings of Peterman and Kennedy (2003).

The significant increase in the mean value for subjective norms may reflect the emphasis within both EEPs on teamwork (e.g., working together in teams of four to six to create business plans) and on giving students the opportunity to build a network with entrepreneurially-minded peers and experienced entrepreneurs. A possible explanation for the positive contributions to PBC may lie in mastery experiences and vicarious learning from role models; most EEPs emphasize "learning by doing" by having students write a business plan and work with actual entrepreneurs. In addition, the teachers tell success stories about entrepreneurs and provide role model by inviting successful entrepreneurs as guest speakers.

Although the reason for the lack of a significant effect of EEPs on ATE is not fully clear and therefore warrants future research, one plausible explanation might be that the students had relatively high scores for this variable at the beginning of the program, so there was not much room left for improving their attitudes. It should be noted that small differences in the mean do not imply that there is no change at all in these variables. Another explanation could be related to the program design. EEPs may have not been designed sufficiently well with regard to persuasion

and attitude change. It is also possible that attitudes are less malleable than — for example — PBC.

The effects of the compulsory programmes on the entrepreneurial intentions of the students may have been insignificant precisely because participation was compulsory, as a comparison analysis showed. Alternatively, the students may have gained a realistic picture of both themselves and being an entrepreneur and decided, in this light, that they do not want to become an entrepreneur. In this sense, we need not conclude that the programmes did not affect the students' entrepreneurial intentions; the programmes may have effectively enhanced student awareness of entrepreneurship and thereby allowed them to effectively assess their futures as entrepreneurs.

A similar explanation was provided by Oosterbeek et al. (2010), who argue that the reason may have been that some participants had lost their excessive optimism about entrepreneurship and rejected the idea of becoming an entrepreneur after the program had finished. von Graevenitz et al. (2010) also argue that EEPs provide individuals with signals about their entrepreneurial ability and aptitude. As a result, some students may become aware that they are not well suited for entrepreneurship.

## **5.6 Implications**

### **5.6.1 Theoretical Implications**

This study has several theoretical implications. It provides further supporting evidence for the application of the theory of planned behaviour in predicting and understanding entrepreneurial intentions in non-Western countries such as Iran. Furthermore, this study contributes to the TPB by examining the effect of entrepreneurship education as an exogenous influence on EI and its antecedents, and it shows that the TPB can provide a useful framework to assess the effectiveness of EEPs.

### **5.6.2 Practical Implications**

In terms of practice, the study provides valuable information and insight for those who formulate, deliver and evaluate educational programs aimed at increasing the EI of students. The findings indicate that PBC is the strongest predictor of EI and, as this study confirmed, PBC can be fostered through EEPs. Therefore, educators should focus more on the use of appropriate teaching methods in order to enhance students' PBC more effectively. According to Bandura (1997), an individual's sense of self-efficacy can be built and strengthened in four ways: mastery experience or repeated performance accomplishments; vicarious experience or modelling; social persuasion;

and judgments of one's own physiological states, such as arousal and anxiety. Entrepreneurship education can play a significant role in developing students' entrepreneurial self-efficacy in these ways by applying the educational activities and teaching methods below (Segal et al. 2007). Our findings strongly suggest that participation in both elective and compulsory EEPs can positively influence students' PBC or self-efficacy, confirming that universities can shape and foster entrepreneurial self-efficacy through EEPs.

Educational activities providing "real world" experience or "virtual reality" experiences in the classroom, including the use of role-playing, case methods, and business simulations, facilitate the development of decision-making skills and strengthen entrepreneurial self-confidence through mastery experiences or repeated performance accomplishments. Vicarious learning can be increased through educational activities such as successful entrepreneurs as guest speakers, video profiles of well-known entrepreneurs, case studies, student internships, and participation in business plan competitions. Encouraging comments, positive feedback, and praise from - and persuasive discussions with- teachers and professionals in educational programs can increase self-efficacy through social persuasion. These activities can also reduce stress levels and anxiety.

In particular, the findings suggest that universities can develop students' EI through elective rather than compulsory EEPs. Therefore, educators should differentiate between compulsory courses offered to all students and courses offered as electives for students who are interested in entrepreneurship. According to von Graevenitz et al. (2010) and Oosterbeek et al. (2010), the primary aim for compulsory programs, with a mix of participants interested in entrepreneurship and participants who are uninterested, is a sorting effect: students attending these programs become informed about entrepreneurship as an alternative career choice and gain more realistic perspectives, regarding both themselves and what it takes to be an entrepreneur. Therefore, after completing EEPs, some students will learn that they are well suited for entrepreneurship and be strengthened in their decision to become entrepreneurs, while others will learn that they are not. In elective courses, on the other hand, self-selection will lead to a higher level of entrepreneurial intention and increase the likelihood of participants becoming entrepreneurs.

The findings also showed that SN influences EI and we can improve SN through EEPs. Some previous studies (e.g., Linan & Chen, 2009; the findings of our initial study that presented in Chapter 2) found that SN also has a relevant effect on EI through ATE and PBC. In particular, in a collectivistic culture such as Iran where family life and relationships with close friends and relatives are important (Javidan & Dastmalchian, 2003; Karimi et al., 2013), SN appears to play a significant role. Therefore, it is suggested that teaching methods and contents specifically designed to improve SN should be included in EEPs. SN can be improved by means of teamwork

and by providing opportunities for students to build a network with entrepreneurial-minded friends and peers, and with role models and entrepreneurs (Mueller, 2011; Souitaris et al., 2007; Weber, 2012). It was concluded that EEPs did not influence ATE because the mean score of this variable was high at the beginning of EEPs. Therefore, we can suggest that if an EEP has attendees who are already highly motivated about entrepreneurship and have high attitudes and EI, the aim of such a program should be "Education for Start-Up" rather than "Entrepreneurial Awareness Education" (according to the classification by Linan, 2004). As discussed earlier, the objective of the latter program is to provide information for students about entrepreneurship so that they consider entrepreneurship as a possible and alternative choice of career. The former program aims at the preparation of individuals for running conventional small businesses and focuses on the practical aspects related to the creation of a new business, such as how to obtain financing, legal regulations, and taxation (Curran & Stanworth, 1989). Entrepreneurial Awareness Education can be offered as a compulsory or elective program, while Education for Start-Up is offered only as an elective.

As mentioned already, policy-makers and university faculties should be aware that different types of EEPs will not have the same effects on all students. Although we cannot recommend one type over the other in general terms, policy-makers and instructors who wish to produce more and better entrepreneurs while subject to cost constraints, should know that elective programs may yield better results. Policy makers and educators should also be aware that cultural context and values play an important part in EEPs. Studies show that the Iranian culture has changed over the last four decades (Tajaddini & Mujtaba, 2011). For instance, the recent study by Karimi and his colleagues (2013) reported that although Iranian students are relational and show great affection toward family members, close friends and relatives (high family collectivism); they also tend to embrace individualistic values (such as personal success and autonomy) to a greater degree than the older generations. Javidan and Dastmalchian (2003) also reported that the Iranian culture is a mix of family ties and connections and a high degree of individualism and it has strong orientations toward achievement and performance. Therefore, policy makers and educators should develop EEPs that accommodate these different cultural values.

## 5.7 Limitations and Future Research

The current study has several limitations that provide future research opportunities. This study assessed only the effects of participating in the EEPs on attitudes and intentions; future research should examine the specific characteristics, design elements, contents, and teaching approaches

of the EEPs, and their relationships to these outcomes. Future researchers may also address the question of why the EEPs foster perceived behavioural control and subjective norms but not attitude towards entrepreneurship.

As we did not have control groups to compare with our treatment groups, we are unable to determine the exact impact of EEPs on students' EI. We can assume that these significant pre-test/post-test differences are the results of participating in EEPs because the content of the EEPs is very specific and not duplicated in other courses; however, the availability of a control group would have strengthened our findings. It should be noted that we did not want to conduct an artificial randomized trial; we preferred a study in a naturalistic academic setting that would not deprive any of the undergraduate students in that department of the potential benefits of participating in EEPs.

In addition to entrepreneurial intentions, another crucial component in the entrepreneurial process is so-called opportunity identification (Ardichvili et al., 2003; Gaglio & Katz, 2001; Shane & Venkataraman, 2000). One of the main outcomes of entrepreneurship education should therefore be enhancement of this capability (Linan et al., 2011; Muñoz et al., 2011). In fact, the formation of new business firms is based on both entrepreneurial intentions and opportunity identification. Both aspects must be present for new business formation to take place (Zander, 2004). Therefore, an important avenue for future studies is to examine the effects of entrepreneurship education on opportunity identification and understand how to foster this competency. The results of interviews with some students and teachers after the post-test measurement indicated that this competency was often ignored or received less emphasis during the courses. Neck and Greene (2011) point out that the majority of entrepreneurship courses are focused on the exploitation of opportunities and assume that the opportunity has already been identified. Where this is the case, very little time and attention is given to creativity, the idea generation process, and how to identify new business opportunities.

Finally, future research should focus on the intention-behaviour relationship, as this crucial link has been studied even less than the one between antecedent attitudes and entrepreneurial intentions. Consequently, a longitudinal study is recommended for future research, to be able to capture the changes in entrepreneurial attitudes and intention over time and the subsequent formation of entrepreneurial behaviour from intention.

## 5.8 Conclusions

This paper aimed to investigate the impact of entrepreneurship education programs on students' entrepreneurial attitudes and intentions using the theory of planned behaviour. The data support both the measurement and the structural model. Our study indicated that the EEPs significantly

influenced subjective norms and perceived behavioural control, but that these programs did not have significant impacts on students' attitude towards entrepreneurship. The study also showed that the elective EEPs significantly increased students' entrepreneurial intention, but that this increase was not significant for the compulsory EEPs.

In sum, this study contributes to our knowledge of entrepreneurship education by illuminating the effects of two types of programmes (i.e., elective versus compulsory programmes) on the entrepreneurial attitudes and intentions of students. The findings roughly correspond to those of other studies conducted using very different entrepreneurship education programmes. These could be: only compulsory entrepreneurship education programmes such as those studied by Fayolle and Gailly (2013) or Oosterbeek et al. (2010); entrepreneurship education programmes with multiple types of objectives, content and outlines like those studied by Souitaris et al. (2007) or Volery et al. (2013); or short-term programmes such as those studied by Fayolle and Gailly, (2013) or Fayolle et al. (2006). Therefore, our study contributes something new by following the suggestions of Zhao, Hills and Seibert (2005) and Oosterbeek et al. (2010), who underline the need to evaluate the effectiveness of different types of entrepreneurship education programmes.

We recommend that others investigate if our findings can be replicated in different educational institutions and EEPs, perhaps using designs comparing the outcomes of EEPs participants with those of nonparticipant groups. As noted earlier, future research might also assess whether different teaching methods and learning environments would have different effects on the outcomes, and whether course educator differences such as skills or academic background would influence the outcomes. In conclusion, this research provides evidence that EEPs are effective, but the current form needs improvement. It is imperative that we begin to understand how to improve EEP learning outcomes, especially regarding opportunity identification. If we don't tackle these issues, we may end up with graduates who lack the abilities and knowledge needed in order to identify new business opportunities and, as a result, failing in the first step of the entrepreneurship process. We hope that our study will encourage further exploration of the results of EEPs, and that it may guide and inspire policy-makers and entrepreneurship educators alike to design and deliver successful EEPs.





# Chapter 6

## Fostering Opportunity Identification Competence

Part of this chapter is based on:

Karimi, S., Biemans, H.J.A., Lans, T., Chizari, M. & Mulder, M. (accepted with minor revisions). Fostering students' competence in identifying business opportunities in entrepreneurship education. *Innovations in Education and Teaching International*.

## Abstract

Opportunity identification and, in particular, the generation of new business ideas is becoming an important element of entrepreneurship education. Researchers and educators, however, struggle with how opportunity identification competence can be enhanced. The purpose of this study was therefore to test the ability of students to generate new business opportunities when they participated in an entrepreneurship course with specially developed creativity exercises. Pre-versus post-test comparisons showed the students who followed the course to subsequently have a higher level of divergent thinking and to perceive themselves as more creative, also with respect to the students who did not enrol in the course. The results also indicate that the course has a significant effect on the students' abilities to generate a greater number and more innovative business ideas in the treatment group; while the control group showed no significant changes in business idea generation. The implications of the results for developing opportunity identification competence and entrepreneurship education in higher education are presented.

## 6.1 Introduction

One of the key elements in the entrepreneurship process is opportunity identification (Ozgen & Baron, 2007; Shane & Venkataraman, 2000; Tang et al., 2012). Identifying opportunities for new businesses is one of the most important abilities of successful entrepreneurs (Ardichvili, Cardozo & Ray 2003). For entrepreneurs and potential entrepreneurs to successfully create and operate new ventures, they must not only develop an intention to start a new business but also create or detect opportunities which others either ignore or fail to notice and exploit these opportunities in a timely and effective manner (Dutta, Li, & Merenda, 2011). Fostering this competence should therefore be a key topic in programmes aimed to train future entrepreneurs (Fiet, 2002; Linan et al., 2011; Lumpkin et al. 2004; Rae, 2003; Sacks & Gaglio, 2002). Entrepreneurship education should thus equip students with the knowledge and skills needed to find and create business opportunities (Sarasvathy, 2008; Neck & Greene, 2011).

Despite the importance of opportunity identification, an important but under-researched question is whether and how the individual's ability to identify new business opportunities can be promoted within a classroom setting (Saks & Gaglio, 2002). As pointed out by Neck and Greene (2011), the majority of entrepreneurship education programmes focus on the exploitation of existing opportunities and thus assume that the opportunity has already been identified. As Faltn (2001, p. 135) further states: "systematic idea development and refinement are rarely ever found in the syllabus of entrepreneurship education". Very little is thus done to train students on how to apply idea generation tools and creatively discover or generate new business opportunities. Entrepreneurship research has also shown this competence to often be ignored or receive little

attention during entrepreneurship courses (Karimi et al., forthcoming). A study by Volery and colleagues (2013), moreover, found that entrepreneurship education did not increase the competence of students in identifying business opportunities. More research on fostering opportunity identification competence via classroom instruction is thus needed (Saks & Gagilo, 2002; Rae, 2003).

The present study attempts to fill this gap by providing insight into how the competence of students for opportunity identification can be fostered in the university classroom. In doing this, the study builds upon recent suggestions by Carrier (2007, 2008), DeTienne and Chandler (2004) and Gundry and Kickul (1996) who state that, in order to foster students' ability to identify new business opportunities, entrepreneurship education should focus on promoting creativity and especially divergent thinking and idea generation. The need for divergent thinking as an important aspect of creative thinking and thus entrepreneurship education has also been suggested by other scholars (e.g., Edelman et al., 2008; Honig, 2004; Yar Hamidi et al., 2008). However, this line of study is still in its infancy and the evidence regarding the promotion of opportunity identification in entrepreneurship education comes largely from developed country contexts.

Another important aspect of creative thinking is creative self-efficacy or what is a vital antecedent of creative behaviour and performance (Mathisen & Bronnick, 2009; Tierney & Farmer, 2002). In line with this, it can be expected that fostering the creative self-efficacy will positively affect the capacity of students for opportunity identification and therefore that efforts to enhance the creative self-efficacy of students should be a central component of any entrepreneurship education programme. However, no study to our knowledge has examined the relationship between students' creative self-efficacy and their ability to identify new business opportunities or the effects of the training of creative self-efficacy within the context of an entrepreneurship education programme.

In sum, there are still many questions in need of answering with regard to how and what pedagogical methods can increase individuals' divergent thinking and their ability to identify new business ideas but also how the cultivation of divergent thinking can be fit into entrepreneurship education. The specific objectives of the present study were therefore to develop an idea-generation training trajectory and integrate this into an entrepreneurship course (a) and then measure the effectiveness of the course (b). Course effectiveness was assessed in terms of two key aspects of the students' creative thinking (i.e., their divergent thinking and creative self-efficacy) but also their business idea generation (i.e., the first step in the opportunity identification process).

It is worth mentioning that most studies have focused on business students (DeTienne & Chandler, 2004; Kickul, 2006). However, the present study focuses on agricultural students. Agriculture is one of the most important economic and social sectors in Iran. It not only supplies the country's food but also accounts for a high percentage of production (25% of the Gross National Product) and employment (23%). Nevertheless, the employment situation of agricultural graduates in Iran shows 22% of them to be unemployed and 35% to be employed in non-agricultural jobs whereas this is only 5% in developed countries (Movahedi, 2009). Lack of entrepreneurial skills and competencies among agricultural students and graduates in Iran appears to be a principal reason for unemployment (Movahedi, 2009). In the present study, we therefore decided to focus on fostering the competence of agricultural students for opportunity identification.

In the next section, we present the theoretical framework for the present study. In doing this, we describe entrepreneurship, opportunity identification, divergent thinking and creative self-efficacy in addition to their interrelationships. The theoretical framework gave rise to a number of hypotheses with regard to fostering creative self-efficacy, divergent thinking and business idea generation, which we tested using the entrepreneurship course, creativity exercises and methods described in the next section. The results of the training and testing of the various hypotheses are presented in the section thereafter, followed by a discussion of the results and their implications for entrepreneurship education and future research.

## **6.2 Theoretical Framework**

### **6.2.1 Entrepreneurship and Opportunity Identification**

Entrepreneurship is the process of identifying, evaluating and exploiting opportunities with the aim of starting a company or venture growth (Baron, 2007a; Shane & Venkataraman, 2000). This process starts with opportunity identification which can be defined as the ability to identify a good idea and transform it into a business concept to add value for the customer or society and generate revenue for the entrepreneur (Lumpkin & Lichtenstein 2005). Opportunity identification has long been accepted as the first but also key step in the entrepreneurial process (Ozgen & Baron, 2007; Bhawe, 1994; Hisrich & Peters, 2002; Shane & Venkataraman, 2000). In fact, without opportunity identification there is no entrepreneurship (Short et al., 2010). Business opportunity identification is thus an essential competence of the successful entrepreneur (Ardichvili et al. 2003; Shane & Venkataraman 2000). And for this reason, opportunity identification competence has become a central element in the scholarly and other study of entrepreneurship along with a

keen interest in the factors, processes, and dynamics that foster the competence (Grégoire, Shepherd & Lambert, 2010).

The generation of new business ideas can be seen as the first step of opportunity identification (Dimov, 2007) and as an important part of the entrepreneurial process in which entrepreneurs — based on their ability to identify and anticipate unmet customer needs (i.e. opportunities for entrepreneurial profit) — come up with and offer solutions for unmet needs in the form of ideas for new business ventures (Gabrielsson & Politis, 2012). In the present study, we focus on the first step of the opportunity identification process, namely the generation of business ideas.

The literature provides two main theories for opportunity identification: discovery theory and creation theory (Alvarez & Barney 2007). According to discovery theory, opportunities "exist out there" in the environment waiting to be identified (i.e., discovered) as unmet needs, unsolved problems or inefficient processes; it is the entrepreneur's job to recognize and uncover these opportunities (Kirzner, 1979; Drucker, 1985; Shane & Venkataraman 2000). In this view, opportunity identification entails largely the cognitive process of scanning the market for disequilibria and resources, on the one hand, and finding ways to exploit these, on the other hand.

According to creation theory, the entrepreneur not only introduces a new product or service but also creates or changes the market conditions for the new product or service. The entrepreneur is the source and creator of opportunities (Alvarez & Barney, 2007; Edelman & Yli-Renko, 2010; Sarason et al., 2006; Sarasvathy, 2008). Opportunities are based upon the subjective perceptions of entrepreneurs and created, endogenously, by their actions, reactions, and learning (Baker & Nelson, 2005; Edelman & Yli-Renko, 2010). And according to Grégoire et al. (2010), this process rests on individual perceptions and the development of loose venture ideas. Some of these ideas will change or be elaborated to become what is typically called a business opportunity.

In the present study, we focus mainly on creation theory because this view presumes that the creativity used for opportunity identification can be learned or at least has some learnable characteristics which play an important role in opportunity identification (DeTienne & Chandler, 2004). In addition, non-business students such as agricultural students have limited knowledge of markets but, instead, discipline-specific knowledge which can be applied for innovations. For non-business students, thus, the creation and development of innovative ideas should be fostered (Nab, et al., 2013).

### 6.2.2 Creativity

Creativity can be defined as the process of generating novel, useful and appropriate ideas or solutions for problems (Amabile, 1996; Hennessey & Amabile, 2010; Runco, 2004; Zhou & George 2001). The creative process calls upon two types of thinking, namely: divergent thinking and convergent thinking (Guilford, 1967; Hennessey & Amabile, 2010). Divergent thinking facilitates the generation of multiple, novel and original ideas while convergent thinking facilitates the detection of applicable, correct and useful ideas (Basadur et al., 1982; Brophy, 1998; Cropley, 2006; Mumford et al., 1991; Acar & Runco, 2011). Both types of thinking are required for the creative process (Cropley, 1999), but divergent thinking is more important than convergent thinking because it occurs at the start of the creative process (Basadur et al., 1982; Ward et al., 1999). Widespread evidence also suggests that divergent thinking represents a distinct capacity which thus contributes to many forms of creative performance (see for review, Batey & Furnham, 2008; Scott et al., 2004). Divergent thinking is also assumed by many to provide a useful estimate of the potential for creative thought (Runco, 1999, 2007; Vincent, Decker, & Mumford, 2002). And for this reason, the most common method used to assess creativity is assessment of divergent thinking (Hocevar, 1981; Kim, 2006).

### 6.2.3 Creativity and Opportunity Identification

Creativity can enhance the process of generating new business ideas and identifying business opportunities (Shane, 2003; Corbett, 2005; Ward, 2004). And while creativity has hardly been studied within the field of entrepreneurship research (Rauch & Frese, 2007), entrepreneurship scholars acknowledge the importance of creativity for the generation of business ideas and identification of business opportunities (Ardichvili et al., 2003; Baron, 2008; DeTienne & Chandler, 2007; Corbett, 2005; Dimov, 2007; Hansen, Lumpkin & Hills, 2011; Lumpkin & Lichtenstein, 2005).

Some scholars argue that the identification of new business opportunities is inherently a creative process (Dimov, 2007; Hills, Shrader & Lumpkin, 1999; Sanz-Velasco, 2006) or, in other words, opportunity identification can be considered a creative process (Hills et al., 1999; Hansen et al., 2006). Other argues that the identification of new business opportunities is at least influenced by creativity (Ardichvili et al., 2003; Baron, 2008; DeTienne & Chandler, 2007; Corbett, 2005; Long & McMullan, 1984; Lumpkin & Lichtenstein, 2005; Hansen, Lumpkin & Hills, 2011). And Vaghely and Julien (2010) have suggested that being creative is one of the components of opportunity identification.

In earlier research, Long and McMullan (1984) describe opportunity identification as creative structuring. Lumpkin and Lichtenstein (2005) later introduced a creativity-based model for opportunity identification with the following steps: preparation, incubation and insight. In

more recent research, opportunity identification has been studied using methods borrowed from the creativity literature such as creative problem solving (Hansen et al., 2011; Kitzmann & Schiereck, 2005), divergent thinking (Walton, 2003) and idea generation (Corbett, 2007; Shepherd & DeTienne, 2005; Ucbasaran, Westhead & Wright, 2009). In sum, opportunity identification can be considered as a domain-specific form of creativity (Ucbasaran et al., 2009). This means that theories and techniques from the creative domain and from learning creativity can be used in the fostering of opportunity identification competence (Nab et al., 2013).

Divergent thinking can play a critical role in opportunity identification (Gielnik et al., 2012). Divergent thinking allows one to produce multiple, original ideas (Guilford, 1950; Mumford & Gustafson, 1988). And the general capacity of the individual to think divergently can be assumed to transfer to various domains (Chen et al., 2006; Clapham et al., 2005), which may also include entrepreneurship.

Penaluna, Coates and Penaluna (2010) contend that divergent thinking is essential in entrepreneurial contexts and that opportunity identification depends on divergent thinking. Empirical studies have indeed shown a significant link between divergent thinking and opportunity identification. Gielnik et al. (2012) found divergent thinking to be positively related to business idea generation and suggested, on the basis of this finding, that divergent thinking may affect entrepreneurship via business idea generation.

According to the creativity literature, the creativity of students in general and their divergent thinking in particular can be promoted by specific training. When Scott et al. (2004) conducted a comprehensive meta-analysis of some 70 studies of evaluating creativity training, moreover, they found that the majority of the successful training programmes targeted the development of divergent thinking. And for most of these training programmes the two skills of problem identification and idea generation were found to contribute strongly and uniquely to the training effects. The findings of other studies also suggest that problem identification and idea generation are essential elements of successful creativity training (e.g., Clapham, 1997; Benedek et al., 2006; Karpova et al., 2011).

The preceding findings with regard to creativity training suggest that courses aimed at enhancing students' abilities to identify new business opportunities through creativity should focus on divergent thinking and help students acquire the skills needed for problem identification and idea generation. As explained in greater detail below, the domains of problem identification and idea generation constitute the two first stages in the process of idea development in which divergent thinking predominates. Training which enhances creativity and promotes divergent thinking may also thus enhance idea generation, and our question becomes which methods of

training can lead to the identification of better and/or more new business ideas and opportunities. And in order to answer this question, we developed and tested a specific model and training intervention which draw upon creation theory and problem-solving theories to determine the skills need for individuals to act creatively and identify new business ideas and opportunities.

#### **6.2.4 Idea Development Process**

The creative process has been described in general by many authors (e.g., Amabile, 1996; Baer & Kaufman, 2006; Cook, 1998; Kao, 1991; Kaufman & Begehtto, 2009; Mumford et al., 1991; Reiter-Palmon & Illies, 2004; Runco & Chand, 1995; Ward, Smith & Finke, 1999). Although they do not overlap completely with regard to the cognitive processes identified, most of the authors identify at least four key stages in the creative process: 1) problem identification; 2) idea generation; 3) idea evaluation and selection; and 4) planning for implementation. Bragg and Bragg (2005) called these four stages as the idea development process. The first two stages are generally considered part of the idea generation phase and make use of divergent thinking; the latter two stages are generally considered part of the implementation phase with the third stage drawing upon convergent thinking and the fourth stage drawing upon both divergent and convergent thinking.

With the idea generation phase of the idea development process in mind, we developed and tested a training intervention to determine which skills are required for individuals to act creatively and generate new business ideas.

#### **6.2.5 Idea Generation Training**

The two first stages or idea generation phase of the idea development process are discussed below, together with how they relate to business opportunity identification. A number of hypotheses are then put forth in the next section with regard to how training can be expected to influence specific aspects of creativity and opportunity identification, namely: creative self-efficacy, divergent thinking and business idea generation.

The stage is *problem identification* or problem finding, individuals must recognize, define and strive to understand the problem or opportunity facing them (Amabile, 1997). Problem identification is essentially the initial stage of creative problem solving. In the case of entrepreneurship, this step focuses on looking for and identifying problems (i.e., “needs” or “pains”) and thus business opportunities in the market. Successful entrepreneurs seek out or anticipate problems, changes, trends and opportunities for improvement or innovation. There are also techniques to nurture creativity and divergent thinking (e.g., the 5Ws plus H questions; Bug Reports), which can then help students seek and shape new business ideas and opportunities. The



result of applying the techniques to stimulate creativity and divergent thinking is much greater insight into the market and an improved capacity to spot problems, inconsistencies, unmet needs and gaps which point to possible opportunities. Key to this step is an awareness that those who currently serve the market have left gaps which could represent potential opportunities (Bragg & Bragg, 2005).

In the stage of *idea generation* or ideation, individuals produce new ideas or possible solutions for an identified problem. Multiple ideas may be generated and, in the case of entrepreneurship, multiple business ideas. Building on the insights and information gathered in step one, this step in the creative process relies upon a combination of techniques to develop or expand a range of possible solutions for the identified problem. A capacity for idea generation is very important for entrepreneurs because they need original insights and ideas (Ames & Runco, 2005). Such techniques as brainstorming and mind mapping can be applied to help students generate significant amounts of ideas, which can then be clustered into groups and considered in the next step of the creative process. The creative process is iterative, moreover, which means that insights from this second step may prompt students to go back to the previous step — in this case, the problem identification — to refine or redefine the opportunity yet.

## 6.2.6 Hypotheses

### 6.2.6.1 Creative self-efficacy

Creative self-efficacy is derived from Bandura's (1997) more general concept of self-efficacy. Creative self-efficacy reflects the confidence of the individual in their ability to perform an innovation task (Tierney & Farmer, 2002, 2011). Tierney and Farmer (2011) showed creative self-efficacy to be positively associated with creative performance within a complex, challenging work environment. And Dayan and colleagues (2013) showed creative self-efficacy to be positively associated with the creative behaviour of entrepreneurs. According to Tumasjan and Braun (2012), creative self-efficacy is particularly well suited for the study of opportunity identification because not only creativity — and, more specifically, divergent thinking — (Corbett, 2005; DeTienne & Chandler, 2004; Ward, 2004) but also self-efficacy have been deemed and shown to an important influence on opportunity identification (Ozgen, 2003). Therefore, creative self-efficacy as a determinant of creativity (Tierney & Farmer, 2002, 2011) can be expected to relate to opportunity identification.

We therefore proposed the following hypothesis:

**H1:** *Students' creative self-efficacy will be positively related to their level of business idea generation.*

### **6.2.6.2 Effects of Idea Generation Training**

According to the literature, creativity is pliable and creative thinking can — and therefore should — be taught (Gregory et al., 2013). Several empirical studies have shown, for example, creativity training to increase both creative thinking (e.g., Clapham, 1997; McIntyre et al., 2003; Cheung, Roskams & Fisher, 2006; Dewett & Gruys, 2007) and the creative self-efficacy of students (e.g., Gist, 1989; Mathisen & Bronnick, 2009; Robbins & Kegley, 2010). When Robbins and Kegley (2010) evaluated the effects of an online creative thinking programme, their results showed significant increases in the students' creative abilities but also creative self-efficacy. When Karpova and colleagues (2011) developed several creativity exercises and measured the creative thinking of students before and after completion of the exercises, they found significantly higher creative thinking following completion of the exercises for students in four of the five participating classes. Finally, when Dewett and Gruys (2007) assessed the influence of a creativity course on MBA students, they found significant positive effects for both the divergent thinking and creative self-efficacy of the students.

As already mentioned, entrepreneurship can be construed as a creative process and, given the unpredictable nature of entrepreneurship, the creative capacity for divergent thinking should be developed. Divergent thinking is needed to start a business but also deal with problems encountered along the way. However, only one study that we know of has developed and tested a training intervention specifically aimed at enhancing the capacity of students to identify business opportunities (DeTienne & Chandler, 2004). Drawing on the four skills identified by Epstein (1996) for the enhancement of creativity, DeTienne and Chandler developed a training model named as SEEC (securing, expanding, exposing and challenging). Based upon the SEEC, DeTienne and Chandler developed an opportunity identification course which involves numerous creativity exercises. The SEEC training significantly improved the ability of business students to produce business ideas in terms of a greater number of ideas but also more innovative business ideas.

For the present intervention study, we drew upon more general creativity theory to increase the ability of students to generate business ideas. The model based on this theory is simple for educators to use. It is also simple to develop creativity exercises on the basis of the model and integrate these into an entrepreneurship course. Educators do not need to develop a stand-alone creativity course or programme in order to stimulate divergent thinking and opportunity identification but, rather, simply introduce creativity exercises. As already mentioned, the idea development process consists of both divergent and convergent thinking and follows similar stages as the opportunity identification process. Depending on the purpose of entrepreneurship courses (from generating a new business idea to writing a business plan),

educators can focus on a specific stage and adopt the relevant creativity exercises to thereby improve the divergent and/or convergent thinking of students for this stage of the opportunity identification process.

Most studies, including that of DeTienne and Chandler (2004), have involved business students. The present study involved non-business (i.e., agricultural) students. Studies show that social science students — which include business and management students — are inclined towards divergent thinking and thus finding multiple solutions while natural science students are inclined towards convergent thinking and thus finding a single solution (e.g., Karakas 2010; Furnham et al., 2011; Mumford et al. 2010). It can therefore be assumed that agricultural students may have a more convergent, analytic style of thinking while a more divergent style of thinking is called for to identify or create new ideas and business opportunities (Kickul et al., 2009). For this reason, extra emphasis must be given on the stimulation of divergent thinking for agricultural students. And in this study, various creativity exercises were thus used to stimulate their divergent thinking.

Drawing upon the preceding, we formulated the following hypotheses with regard to the effectiveness of idea generation training when used with higher education agricultural students:

**H2:** *Students who have followed the entrepreneurship course will have higher (a) creative self-efficacy, (b) divergent thinking scores and (c) business ideas generated after the training than before.*

**H3:** *Students who have followed the entrepreneurship course will have higher (a) creative self-efficacy, (b) divergent thinking scores and (c) business ideas generated than students in an untrained control group.*

## 6.3 Research Method

### 6.3.1 Study Context

“Fundamentals of Entrepreneurship” is an elective/or compulsory course taught to bachelor students during the last two years of study in different faculties/departments in Iranian universities. The aims of course are to increase knowledge of entrepreneurship, enhance entrepreneurial attitudes, promote entrepreneurial intentions and encourage students to become job creators as opposed to job seekers.

In a recent study of the effectiveness of existing entrepreneurship courses in Iranian universities (Karimi et al., forthcoming), teachers were found to not pay sufficient attention to the enhancement of student creativity and ability to generate new business ideas. In the present research, we therefore targeted the idea development process and the idea generation phase of

the idea development process via exercises designed for incorporation into existing entrepreneurship courses.

The Fundamentals of Entrepreneurship course was redesigned for purposes of the present research and divided into three parts. In part I, the instructors introduce the students to the basic concepts, central theories and research related to creativity, innovation, opportunity identification, idea generation and entrepreneurship. The students also gain insight into the characteristics of entrepreneurship and the skills which this needs, but it is also emphasized that everyone can be creative. In part II of the course, the students apply the concepts and theories introduced in part I to complete a total of 12 creativity exercises and activities (e.g., the 5 Whys, bugs report, problem reversal, brainstorming, elevator pitch, ideas notebook). At the first class meeting during part 1 of the course, the ideas notebook is introduced and explained. The students are instructed to always carry the notebooks with them to jot down any ideas which spring to mind and to note at least five ideas per week. The students turn in the notebooks twice during the course. During the remainder of the course, the creative exercises are performed according to the stages of idea development (i.e., problem finding and idea generation). The teachers facilitate the exercise sessions by explaining the exercises to the students and demonstrating how to do them.

In part III of the course, information is presented on the analysis of market potential, financial management and the different parts of a business plan. Small groups of students are asked to prepare and present a business plan which must include the identification of a feasible business opportunity. Each group must also interview an entrepreneur and prepare a report on the interview. Both individual and team learning are stimulated by requiring the students to first explore and present their own ideas individually and then do this as part of a self-managed team (i.e., explore and present team ideas).

The instructors also used additional reading assignments, lectures and classroom discussion to enhance the creative, innovative and entrepreneurship abilities of the students. Four entrepreneur guest speakers were invited to participate in question and answer sessions, tell their success stories, share their experiences and provide real-life examples of how business ideas and opportunities are identified and exploited. The course had 32 sessions held across a period of 16 weeks (i.e., semester). Sessions were held bi-weekly and had duration of two hours. The class had 33 students and was divided into groups of 4-5 students for the small-group (i.e., team) work.

### **6.3.2 Creativity Exercises**

To help the students identify problems and opportunities, generate ideas and engage in creative thinking, several creativity exercises and activities were adopted from various sources (Table 6.1).

As Gundry and Kickul (1996) once observed, some students may be quick to label themselves as “uncreative.” Creativity exercises also therefore serve to increase a student’s belief in his or her own creative potential. Greater confidence in the ability to generate new ideas can improve divergent thinking (Mathisen & Bronnick, 2009; Robbins & Kegley, 2010) and thereby the capacity of students for opportunity identification (Krueger, 2000; Gibbs, 2009). The main goal of the creativity exercises was therefore to push students out of their comfort zones, to allow them to become more comfortable with the taking of risks and to encourage them to explore new ways of thinking in order to enhance their confidence in their ability to generate new ideas. In working to enhance students’ creative self-efficacy and idea generation skills, we targeted three sources of self-efficacy (Bandura, 1997): vicarious learning experiences (or role modelling), which entails the observation of educators or other students successfully using creative techniques; enactive mastery, which requires sufficient opportunities for the practice of techniques and successful engagement in relevant real-life activities to build sufficient creative self-efficacy; and verbal persuasion or the receipt of constructive criticism, positive feedback and enough support to affirm the student’s ability to act creatively. Verbal persuasion can persuade students that they are able to act creatively. These three sources of self-efficacy were called upon because social learning theorists emphasize their importance for the training of optimal skill development but also confidence (Kleiner, 1996).

The creativity exercises were classified according to the idea generation phase of the idea development process to which they pertained: (1) exercises such as “the 5Ws plus H” and the “Bugs report” pertained to problem identification (stage one); (2) exercises such as brainstorming and picture stimulation pertained to idea generation (i.e., stage two).

A broad range of exercises was introduced, based on the idea that “creative ideas are most likely to arise through the use of diverse concepts, multiple features, and multiple strategies” (Mumford, 2000, p. 316). However, the time span for the course was restricted, which meant that only 12 exercises were practiced in-depth. As already noted, some of the exercises involved just the individual student. The majority of the exercises, however, involved the small group. Examples of the two types of exercises are presented below.

**The Bug Report:** The objective of the Bug Report is for students to learn to be more creative and innovative through the negative experiences in their daily lives. Students first identify products or services which annoy or “bug” them (i.e., negative experiences from their daily lives) and then generate ideas to innovatively solve the problems (Kim & Fish, 2009). Problem identification has been shown to thrive when a connection to broader life experiences exists (Mumford, 2000).

The exercise requires students to identify, for a period of a week, products and services which "bug" them. They must submit a table with the following information: at least 20 such products and services, why the item bothers them and how to improve the item. Each student developed this table by reflecting on their own life, personal needs, activities, hobbies, relationships, observations and so forth. The students were also encouraged to look for problems related to their field of study (i.e., agricultural sciences). The suggestion of a solution or improvement for each of the recorded bugs is emphasized in this exercise. The students must also highlight the possible advantages of their solutions over those already available.

After this, the students are instructed to filter their bugs and select five which appear to call for innovation and therefore represent an opportunity for the development of a new product or service to build a venture around. The students — initially alone and subsequently in small groups — then brainstorm on the possibilities for the identified bugs. In discussing the solutions for the bugs, they are encouraged to discuss market availability, financial requirements, technical feasibility and available human resources.

**Picture Stimulation:** This is a well-known technique used to encourage people to think completely differently and view a situation from a different perspective. The technique encourages people to break away from their normal paradigms of thinking.

For the picture stimulation exercise, group's members first state a problem. They are then asked to look at a special set of colourful pictures and relate these to a future scenario for the problem which has just been stated (Johnson, 1991; McFadzean, 2000; Vidal, 2006; van Gundy, 1992; Gundry & Kickul, 1996). This procedure encourages people to view a situation from alternative perspectives and can spark creative, new ideas, which can then be linked back to the stated problem. The special set of pictures contains a variety of stimuli which include objects, actions and textures. The pictures should show some action and not be too abstract. They should not contain a lot of people or close-ups of people. Instead, pictures of cities, factories, the countryside and the likes are good choices. *National Geographic* or *Newsweek* magazine are good sources (van Gundy, 1992).

In the present research, five pictures unrelated to the problem of "improving the packaging of agricultural products" were presented. The students were first asked to write the problem down for themselves. The first picture from the set of pictures was then shown via a projector and the students asked to do the following:

1. Describe what you see in the picture in detail, noting any relationships, concepts and principles which are present. In particular, describe whatever action you see — actual or implied.
2. Use each description as a stimulus to generate new and novel ideas with regard to it.

3. Write down all of the ideas which you come up with.
4. Relate the information and ideas provided for the picture back to the problem and then discuss and develop this information and ideas further.

The above steps were repeated for four other pictures. At the end of the exercise, the students were asked to share their thoughts about the process and reflect on how the exercise affected their ability to think in unusual ways.

**Table 6.1** Idea Generation Training and Creativity Exercises

Idea development stages	Exercises and Resources
<b>Problem identification</b>	5Ws & H (Bragg & Bragg, 2005; Higgins 1999; Cook, 1998) Bugs report (Michalko, 2006; Morris, 2006; Kim & Fish, 2009) Failure 101 (Michalko, 2006; Matson, 1991)
<b>Idea generation</b>	Slice and Dice based on listing attributes (Michalko, 2006) Ideas notebook (McGrath & MacMillan, 2000; Starko, 2010; Higgins, 1994) What-iffing (van Gundy, 2005; Michalko, 2006; Morris, 2006; von Oech, 2008) Problem reversal (van Gundy, 2005; Michalko, 2006; Brainstorming (Osborn, 1963; Proctor, 1995; McFadzean, 1999; Proctor, 2010; Starko, 2010) Mind mapping (Buzan, 1993; Michalko, 2006; Sloane, 2006; Anderson, 1993; Proctor, 2010) Force-fitting (Treffinger, 2000; Bragg & Bragg, 2005; Isaksen et al., 2011) Picture Stimulation (van Gundy, 1992; Gundry & Kickul, 1996; Higgins, 1994) Elevator pitch (Sjodin, 2012; Pincus, 2007; DeTienne & Chandler, 2004; Katz & Green, 2007)

### 6.3.3 Participants and Procedure

A quasi-experimental pretest–posttest control group design (Cohen & Manion, 1989) was used to determine significant changes in divergent thinking ability, creative self-efficacy and business idea generation across a period of approximately four months (September 2012–December 2012). The participants in the study were 68 undergraduate students of agricultural sciences at a university in Iran. The mean age of the participants was 22.25 years; 28% was male. The majority of the students (90%) did not have prior entrepreneurial experience.

The treatment group (33 students: 23 female, 10 male) took the redesigned Fundamentals of Entrepreneurship course as an elective course. The control group (35 students: 26 female, 9 male) did not take the redesigned course. Data were collected before and after completion of the courses for both groups. And it was clearly explained to the participating students that the data was being collected for strictly research purposes; participation was voluntary; and responses would not affect their grades for the course.

### 6.3.4 Measures

Measures of the following three variables were administered to all participating students on two occasions (i.e., t1, t2): creative self-efficacy, divergent thinking and business ideas generation.

**Creative self-efficacy (CSE):** A measure consisting of three questionnaire items was used to assess creative self-efficacy. This measure was developed with established reliability in the seminal work of Tierney and Farmer (2002). The three items are: (a) “I feel that I am good at generating novel ideas,” (b) “I have confidence in my ability to solve problems creatively,” and (c) “I have a knack for further developing the ideas of others.” Respondents respond to each item using a Likert-type scale which ranged from 1 (= “very strongly disagree”) to 7 (= “very strongly agree”). The alpha coefficient for this scale was .85 at t1 and .83 at t2, which shows high reliability.

**Divergent Thinking:** The Alternative Uses Task (AUT: Guilford, 1967) was used to measure divergent thinking. This type of test is often used in the study of creativity and divergent thinking (e.g., Beaty & Silvia, 2012; Gilhooly et al., 2007; von Stumm, Chung & Furnham, 2011). And divergent thinking tests have been shown to consistently predict who will produce novel and useful products (Batey, 2007; Guilford, 1967).

The AUT asks participants to list as many new and unusual uses for three different items in a total of 9 minutes (i.e., a brick, a newspaper and a hanger at t1; a paperclip, a pencil and a blanket at t2). The standard use for each item is first stated (e.g., a newspaper is generally used for reading). Respondents are then told that they should not repeat a function and that the uses they suggest should be logical and make sense. The objective of the AUT is to have the respondent generate as many possible uses that are different from the standard use for familiar objects.

The responses on the AUT are scored with regard to two components: fluency and originality. *Fluency scores* are obtained by summing the number of ideas produced by each participant for the three objects. Following Gilhooly et al. (2007), *originality* is defined as “an idea or suggestion that is infrequent, novel, and uncommon” and is measured by rating the responses provided on the AUT along a seven-point scale (1 = *not at all original*, 7 = *very original*).

Two judges calculated the fluency and originality scores per participant at time 1 and time 2. The interclass correlation coefficients (ICCs) for the fluency ratings were found to be .95 at t1 and .96 at t2, showing excellent agreement (ICCs > .75 are usually considered “excellent”; see Cicchetti, 1994). The ICCs for the originality ratings were .87 at t1 and .82 at t2, also showing excellent agreement. The two ratings were aggregated to produce a single fluency score and single originality score separately at t1 and t2.



**Business Idea Generation (BIG):** In this test, participants were asked to come up with ideas for new products or services to start a new business. The following task was given to the participants (DeTienne & Chandler, 2004): “Please take a moment to think back on the events and activities of the last 24 hours. These may include: commuting, social encounters, classes, homework, hobbies, work, family or organizations in which you are involved. Please list below any new business idea which you may have observed. List any and all ideas which come to your mind— you need not worry about whether the ideas have a high or low potential for success. Do not limit yourself; the more ideas you can list, the better.”

The data was then entered into a spread sheet exactly as expressed by the participants and coded by two independent judges. The judges coded two dimensions of the ideas expressed by the participants: the total number of ideas and the innovativeness of the ideas.

To obtain the total number of business ideas generated, the number of non-redundant business ideas was counted. Following DeTienne and Chandler (2004), if an idea did not provide sufficient information for the judges, it was omitted. The inter-rater agreement between the two judges for the total number of unique business ideas generated was excellent (ICC of .89 at t1 and .92 at t2).

The innovativeness of the business ideas generated by the students was judged using a six-point scale originally developed by Fiet (2002) and later modified by DeTienne and Chandler (2004). Two judges rated the innovativeness of the business ideas generated using the following anchors: (1) No apparent innovation or not enough information to make a determination; (2) A product or service identical to an existing product/service offered to an underserved market; (3) A new application for an existing product/service, with little/no modification or a minor change to an existing product; (4) A significant improvement to an existing product/service; (5) A combination of two or more existing products/services into one unique or new product/service; or (6) A new-to-the world product/service, a pure invention or creation. The inter-judge reliabilities for the ratings of the innovativeness of the business ideas generated were .81 at t1 and .85 at t2, indicating high consistency between judges.

The codings provided by the two judges were aggregated to attain a single total number of ideas score and a single innovativeness of ideas score for the business ideas generated separately at t1 and t2.

### 6.3.5 Statistical analyses

We tested our hypotheses using the following statistical methods: (a) correlations were calculated between the measures of creative self-efficacy and business idea generation (Table 6.2) and (b) repeated measures analyses of variance (ANOVAs), paired-samples independent t-tests were

calculated for the effects of the training course on creative self-efficacy, divergent thinking and business idea generation (see Tables 3 and 4 and Figures 1 - 5).

## 6.4 Results

Measurement at t1 showed no significant differences between the treatment and control groups with respect to age ( $t=1.56$ ), gender ( $t=.416$ ), entrepreneurial experience ( $t=-1.10$ ), divergent thinking (AUT fluency:  $t=0.516$ ; AUT originality:  $t = -0.408$ ), creative self-efficacy ( $t=0.454$ ) or business idea generation (BIG number:  $t=1.02$ ; BIG innovativeness:  $t=-0.717$ ).

The descriptive statistics and correlations for the study variables before and after course completion are presented in Table 6.2. Creative self-efficacy at both t1 and t2 correlated with the two BIG components at both t1 (BIG Number= .40,  $p<.01$ ; BIG Innovativeness:  $r=.38$ ,  $p<.01$ ) and t2 (BIG Number= .42,  $p<.01$ ; BIG Innovativeness:  $r=.31$ ,  $p<.01$ ). It thus appears that those who perceive themselves as creative also generate more business ideas and more innovative business ideas than those who do not perceive themselves as creative. These findings fully support Hypothesis 1.

**Table 6.2** Descriptive statistics and Pearson correlations for total sample (N=68)

Variable	M	SD	1	2	3	4	5	6	7	8	9
1-AUT : Fluency(t1)	11.6	3.32									
2-AUT:Originality (t1)	2.57	.67	.67**								
3- BIG: Number (t1)	2.15	1.21	.25*	.25*							
4- BIG: Innovativeness (t1)	1.77	.59	.19	.31*	.42**						
5- CSE (t1)	4.13	1.48	.28*	.23	.40**	.38**					
6-AUT: Fluency (t2)	13.78	3.87	.44**	.21	.26*	.23	.40**				
7- AUT: Originality (t2)	3.17	.58	.33**	.34**	.25*	.18	.19	.60**			
8- BIG: number (t2)	2.54	1.35	.22	.11	.36**	.29*	.35**	.31*	.26*		
9- BIG: Innovativeness (t2)	1.85	.66	.18	.19	.42**	.56**	.31*	.27*	.31*	.60**	
10- CSE (t2)	4.53	1.36	.24	.04	.27*	.28*	.44**	.33**	.29*	.42**	.31**

\*\* $P<0.01$ , \* $P<0.05$ ; AUT: Alternative Uses Task; BIG: Business Ideas Generation; CSE: Creative Self-efficacy

To determine if the creative self-efficacy, divergent thinking skills and business idea generation of the students differed across the groups and/or over time (i.e., after completion of the course), a  $2 \times 2$  (group  $\times$  time) repeated measures ANOVAs were conducted.

For creative self-efficacy, a significant main effect of time was found ( $F_{[1, 67]} = 5.578$ ,  $p = 0.021$ , partial  $\eta^2 = 0.078$ ). This suggests that creative self-efficacy changed significantly from t1 to t2 for both groups. A significant main effect of group was also found ( $F_{[1, 67]} = 4.314$ ,  $p = 0.042$ , partial  $\eta^2 = 0.061$ ). The treatment group generally produced higher creative self-efficacy scores than the control group. More importantly, the interaction between time and group was significant

( $F_{[1, 67]} = 5.834$ ,  $p = 0.018$ , partial  $\eta^2 = 0.081$ ), which shows the magnitude of the gains over time to be more pronounced for the treatment group relative to the control group (Figure 6.1).

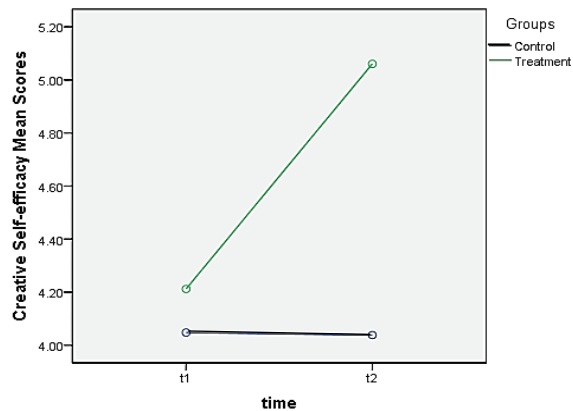


Figure 6.1 Pre to post change of creative self-efficacy scores for groups

For the AUT fluency scores (i.e., divergent thinking), the results showed a significant main effect of time ( $F_{[1, 67]} = 26.571$ ,  $p = 0.000$ , partial  $\eta^2 = 0.28$ ), a significant main effect of group ( $F_{[1, 67]} = 7.139$ ,  $p = 0.009$ , partial  $\eta^2 = 0.098$ ) and a significant interaction between time and group ( $F_{[1, 67]} = 11.763$ ,  $p = 0.001$ , partial  $\eta^2 = 0.151$ ). This indicates a group difference in the changes in the fluency scores over time. That is, the fluency scores for both groups improved but those for the treatment group improved significantly more than those for the control group over time (Figure 6.2).

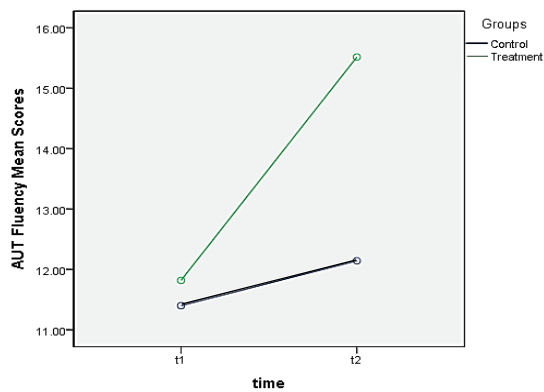


Figure 6.2 Pre to post change of AUT fluency scores for groups

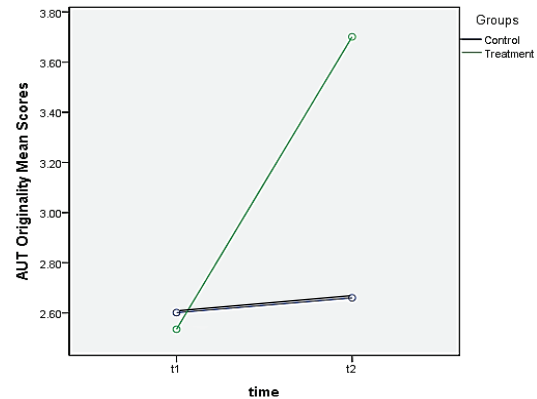
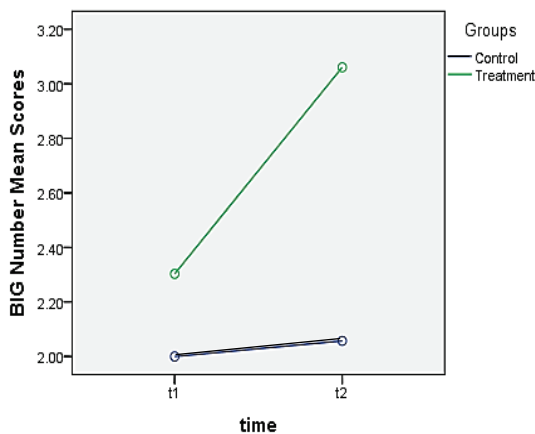


Figure 6.3 Pre to post change of AUT originality scores for groups

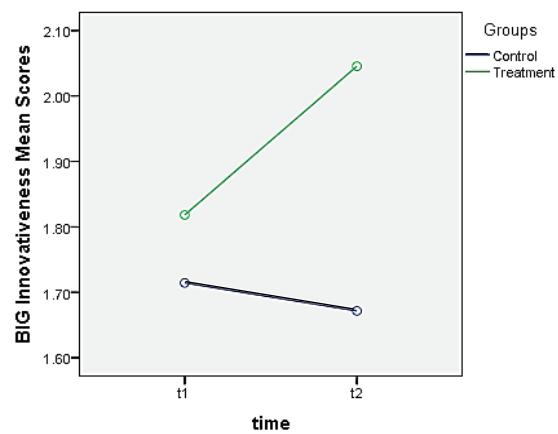
For the AUT originality scores (i.e., divergent thinking), the results showed a significant main effect of time ( $F_{[1, 67]} = 52.656$ ,  $p = 0.000$ , partial  $\eta^2 = 0.444$ ), a significant main effect of group ( $F_{[1, 67]} = 12.022$ ,  $p = 0.001$ , partial  $\eta^2 = 0.154$ ) and a significant interaction between time and group ( $F_{[1, 67]} = 43.02$ ,  $p = 0.000$ , partial  $\eta^2 = 0.395$ ). The AUT originality scores changed more for the treatment group than for the control group (Figure 6.3).

The BIG results revealed a significant main effect of time for the number of business ideas generated ( $F_{[1, 67]} = 5.473$ ,  $p = 0.022$ , partial  $\eta^2 = 0.077$ ). This shows the number of business ideas generated at pre- versus post-test to differ significantly. A significant main effect of group was also found ( $F_{[1, 67]} = 6.996$ ,  $p = 0.010$ , partial  $\eta^2 = 0.096$ ). This shows the treatment group to generate more business ideas than the control group on average. Furthermore, the interaction between time and group was significant ( $F_{[1, 67]} = 4.046$ ,  $p = 0.048$ , partial  $\eta^2 = 0.058$ ), confirming that the treatment group would gain more from the entrepreneurship course than the control group in terms of the number of business ideas generated (Figure 6.4).

As Figure 6.5 depicts, the innovativeness of the business ideas generated at t2 was greater than at t1. However, the results show no significant main effect of time ( $F_{[1, 67]} = 1.715$ ,  $p = 0.195$ ,  $\eta^2 = 0.025$ ) and a marginally significant main effect of group ( $F_{[1, 67]} = 3.275$ ,  $p = 0.075$ , partial  $\eta^2 = 0.047$ ). The interaction between time and group was also marginally significant ( $F_{[1, 67]} = 3.680$ ,  $p = 0.059$ ,  $\eta^2 = 0.053$ ). The treatment group thus gained significantly with regard to the innovativeness of the business ideas generated after participation in the entrepreneurship course while the control group did not.



**Figure 6.4** Pre to post change of BIG number scores for groups



**Figure 6.5** Pre to post change of BIG innovativeness scores for groups

Follow-up t-tests for paired samples further showed significant differences over time for the treatment group on the measures of interest in this study. A positive, significant difference in divergent thinking as measured by the alternative uses task (AUT) was found at t1 versus t2 for the treatment group (Table 6.3). A similarly significant difference was found for the number of business ideas generated at t1 versus t2 for the treatment group, but the innovativeness of the generated business ideas only differed marginally (but significantly) after participation in the course. The follow-up results also show a significant increase in creative self-efficacy for the treatment group following participation in the course. For the control sample, the paired t-tests

did not reveal significant differences over time for any of the variables of interest. Hypotheses 2a, 2b, and 2c can thus be accepted on the basis of these results.

**Table 6.3** Results of paired t-tests for the treatment group (N = 33) versus control group (N=35) at pre-test and post-test

Scale	Treatment group						Control group					
	Pre-test		Post-test		Difference		Pre-test		Post-test		Difference	
	M	SD	M	SD	t(32)	p	M	SD	M	SD	t(34)	P
AUT: Fluency	11.82	3.41	15.52	4.17	4.934	.000	11.40	3.26	12.09	2.77	1.548	.131
AUT:Originality	2.54	.62	3.70	.78	7.782	.000	2.60	.72	2.66	.57	.708	.484
BIG: Number	2.30	1.26	3.06	1.54	2.786	.009	2.00	1.19	2.06	.94	.259	.797
BIG:Innovativeness	1.82	.54	2.05	.69	1.936	.062	1.71	.64	1.67	.58	-.533	.597
CSE	4.21	1.37	5.06	1.20	3.539	.001	4.05	1.60	4.04	1.34	-.037	.971

AUT: Alternative Uses Task; BIG: Business Ideas Generation; CSE: Creative Self-efficacy

Finally, the results of the independent samples t- tests for the treatment versus control groups when compared before and after the course for divergent thinking, business idea generation and creative self-efficacy showed the two groups to not differ significantly before course participation. As shown in Table 6.4, however, those students who followed the redesigned entrepreneurship course produced higher scores on all of the variables of interest than the students in the control group after following their course. On the basis of these findings, hypotheses 3a, 3b and 3c can be accepted.

**Table 6.4** T-test results for comparison treatment and control groups before and after course participation

Scale	Pre-test			Post-test		
	Treatment group	Control group	Difference	Treatment group	Control group	Difference
	M	M	t	M	M	t
AUT: Fluency	11.82	11.40	.516	15.52	12.09	4.017***
AUT: Originality	2.53	2.60	-.408	3.70	2.66	6.306***
BIG: Number	2.30	2.00	1.02	3.06	2.06	3.267**
BIG: Innovativeness	1.82	1.71	.717	2.05	1.67	2.426*
CSE	4.21	4.05	.454	5.06	4.04	3.314**

\*\*\* $P < 0.001$ , \*\* $P < 0.01$ , \* $P < 0.05$ ; AUT: Alternative Uses Task; BIG: Business Ideas Generation; CSE: Creative Self-efficacy

## 6.5 Discussion

This study investigated the effects of idea generation training and related creativity exercises when incorporated into an entrepreneurship course. The creative self-efficacy, divergent thinking and business idea generation of agricultural students were assessed before and again after course participation. The results indicated that students' creative self-efficacy and divergent thinking (as

measured by the Alternative Uses Task) increased significantly after the course which included explicit idea generation training. These findings support other research findings indicating that trainings with a focus on the skills of problem identification and idea generation can enhance the creative thinking capacity of students (Dewett & Gruys, 2007; Karpova et al., 2011; McIntyre et al., 2003; Scott et al., 2004) and their confidence in their creative abilities (Dewett & Gruys, 2007; Mathisen & Bronnick, 2009; Robbins & Kegley, 2010). Some components of creativity, such as personality, appear to be relatively stable and thus not easy to change. Divergent thinking skills and creative self-efficacy, in contrast, appear to be more amenable to change. Our findings also support the premise of Scott et al. (2004), namely that educators can employ a simple set of strategies to positively influence the divergent thinking of students. An implication arising from these findings is that incorporating a series of short and simple creativity exercises concerned with problem finding and idea generation into existing entrepreneurship courses, as done in the present study, can significantly enhance students' creativity thinking and confidence in their creative abilities. Even though there are a variety of creativity training programmes currently available, research suggests that the most effective programmes involve a cognitive framework which is centred around the core processes of problem identification and idea generation (Scott et al., 2004). The exercises adapted for this study utilized this approach.

Theory about creative self-efficacy asserts that beliefs with regard to one's ability to act creatively influences one's willingness to act creatively, attempts to act creatively, how much effort is spent doing this and how long one perseveres in the face of difficulties during the creative process (Tierney & Farmer, 2002). The present results indeed show students' creative self-efficacy to be positively related to their level of business idea generation. Other recent research (Dayan et al., 2013) supports a direct link between the creative self-efficacy and creative behaviour of entrepreneurs. Tierney and Farmer (2011) further found that creative self-efficacy was positively related to creative performance within a complex, challenging work environment. It can thus be concluded that the development of creative self-efficacy should be a key component of creativity and entrepreneurship programmes in higher education.

As already mentioned, educators can foster creative self-efficacy by providing mastery experiences, vicarious learning experiences (i.e., observation of others successfully using creative tools) and verbal persuasion (i.e., convincing students that they have the capabilities needed to act creatively). The link between these teaching strategies and creative self-efficacy has further implications for educators who are interested in developing the creative self-efficacy of students. Teachers can structure creativity tasks in such a manner that students will always eventually succeed and make sure that students with low creative self-efficacy are also capable of mastering even more challenging tasks (Mathisen & Bronnick, 2009).

With regard to promoting a capacity for generating business ideas, our results showed training on the specific skills of problem identification and idea generation to generate both a greater number of and more innovative business ideas. These results are in keeping with the results of previous studies showing entrepreneurship education which emphasizes creativity to foster the ability of students to identify business ideas and opportunities (DeTienne & Chandler, 2004). Given that business idea generation is the first step in the opportunity identification and entrepreneurship process, idea generation can be considered a core skill for entrepreneurship. The present results show that this skill is learnable and that individuals can thus develop a capacity for identifying business opportunities.

The ability to generate new ideas and identify innovative business opportunities is clearly fostered by the development of divergent thinking skills. Creativity models and particularly a model of idea generation provide a suitable framework for better understanding how this can best be done. Educators and course planners can learn from inspection of such models to develop educational environments which explicitly promote creativity. They can also learn from creativity models to design entrepreneurship courses which clearly foster divergent thinking and thus an ability to *identify* business opportunities.

The efficacy of developing a stand-alone course to teach creativity has been shown (e.g., Birdi, 2005; Cheung et al., 2006; Dewett & Gruys, 2007; Fontenot, 1992; Kabanoff & Bottger, 1991), but the efficacy of incorporating creativity training into an existing course is still in question (McIntyre et al., 2003). Given the limits on introducing new courses into educational curricula, the incorporation of creativity training into existing courses is promising and critical. Drawing upon a model of creativity, we were able to effectively integrate training on idea generation into an existing entrepreneurship course. Other educators should be able to use the same or a similar model to incorporate creativity into entrepreneurship training.

In sum, as educators and course planners develop entrepreneurship curricula, training on idea generation and the use of creativity exercises with a focus on the skills of problem identification and idea generation will be needed to enhance the divergent thinking and opportunity identification capabilities of students.

## 6.6 Limitations and future research

The current study had some limitations which provide future research opportunities. First, the small sample size may allow biases. A larger sample of students randomly assigned to treatment and control groups will allow more definitive conclusions and help validate the results presented here.

Second, only two factors considered critical for creativity were investigated in the present study, namely divergent thinking and creative self-efficacy. Several factors can be assumed, however, to influence the creative performance of individuals. The factors may include contextual factors, personal factors and the interactions between these and other factors (Shalley et al. (2004). Some studies, moreover, have shown cultural context and values (e.g., individualism and collectivism) to influence how people approach not only problem identification and solution (Choi, Koo, & Choi 2007) but also idea generation and development (Basadur, Pringle & Kirkland 2002; Yao et al., 2012). Further research is therefore needed to better understand the role of these factors in students' creative development, the efficacy of entrepreneurship education and the necessity of creativity training as part of this education. In addition, it has been suggested that classroom climate is a factor which can significantly affect creativity (Cole et al., 1999). When Hunter, Bedell and Mumford (2007) conducted a meta-analysis of the effects of various dimensions of the classroom climate (e.g., support, autonomy) on indices of creative performance, they found *perceptions* of the classroom *climate* to strongly affect creative *performance*. Future studies should therefore explore the effects of the classroom environment (such as teacher-student relationships) on creativity, on the one hand, and just how the educational environment and creativity training can best be integrated into entrepreneurship courses to stimulate creativity, on the other hand.

A third limitation is that the students' divergent thinking, creative self-efficacy and business idea generation were only measured at the end of the final course session and not thereafter. The longitudinal effects of incorporating idea generation training into a course on entrepreneurship are therefore not known. Longitudinal data is nevertheless vital as it is possible that students may need to continually practice the acquired techniques for creative thinking in order to maintain them (Karpova et al., 2011). In addition, the degree to which the training of business idea generation influences subsequent behaviour in the world of work needs to be discerned. Future research should thus examine the effects of creativity training over a longer period of time as well as after graduation to the workplace.

A fourth possible limitation is the use of the Alternative Uses Task to assess divergent thinking. While this measure appears to be sound, future research should also possibly call upon more rigorously tested measures of creativity and divergent thinking like the Torrance Tests of Creative Thinking (Torrance, 1988), the Consensual Assessment Technique (Amabile, 1982), the Profile of Creative Abilities (PCA: Ryser, 2007), the Creative Achievement Questionnaire (CAQ; Carson, Peterson & Higgins, 2005) or the Creative Personality Scale (CPS: Gough, 1979).

Fifth, a number of creativity exercises were implemented in the present study, but it is unclear which of the exercises or what components enhanced creativity and business idea



generation. The focus in our study was on the overall effectiveness of the entrepreneurship course as a package. For future training efficiency and the development of curricula, the most effective exercises and elements from these exercises should be identified. Not only will this information give us a greater understanding of the components of creativity training programmes which clearly enhance divergent thinking and the capacity identify or generate promising business opportunities, it will also lead to increased effectiveness and efficiency in the delivery of entrepreneurship programmes.

Sixth and as already mentioned, one of the main components of the entrepreneurship process is opportunity identification, which starts with the generation of a business idea. The distance between a business idea and turning the idea into a successful business is substantial, however, and requires many other crucial skills — including relationship and organizing competences (see Man et al., 2002). Future research should therefore investigate how to foster and develop these competencies in students as well.

Lastly and as previously mentioned, the focus of the present study was on the capacities of students for divergent thinking and business idea generation. Divergent thinking can help people produce many original ideas. The next stage in the creative process, however, is the evaluation and selection of ideas for further development which calls upon convergent thinking. Convergent thinking facilitates the detection of feasible, suitable and useful ideas (Cropley, 2006; Mumford et al., 1991). Some of the other problems faced by entrepreneurs — like financial and economic evaluation — also require convergent thinking (Honig, 2004). Moreover, in the fourth stage of the idea development process and thus the planning of the implementation for an idea, both divergent and convergent thinking have been found to play important roles (Bragg & Bragg, 2005). Future research should thus consider the roles of both divergent and convergent thinking in the idea development process and thus in the trajectory from opportunity identification to implementation planning.

## **6.7 Conclusions and recommendations**

The ability to generate new business ideas and creatively solve problems is an essential attribute of entrepreneurs who aim to thrive in an increasingly competitive and challenging marketplace. Correspondingly, students as potential entrepreneurs must also develop these abilities and skills.

Idea generation training developed on the basis of a model of the idea development process and incorporated into an existing entrepreneurship course can enhance the divergent thinking and creative self-efficacy of students and help them generate not only a higher number of new business ideas but also more innovative business ideas than traditional entrepreneurship

courses. The way can thus be paved for students to become entrepreneurs. It is thus recommended that creativity in general and business ideas generation in particular be incorporated more extensively into entrepreneurship education. Considering the difficulties of introducing new creativity courses into institutional curricula, the development of clearly effective creativity activities and exercises for incorporation into existing courses might be therefore recommended as a feasible strategy for fostering student creativity and entrepreneurship. The present study is an example of the successful integration of creativity training into an existing entrepreneurship course for educators to follow.

Increased creativity and opportunity identification competence predict increased levels of entrepreneurial intentions among students (Zampetakis & Moustakis, 2006; Karimi et al., forthcoming) and entrepreneurial intentions are the best predictor of later entrepreneurial behaviour (Kautonen, van Gelderen & Fink, 2013; Krueger et al., 2000). Fostering creative thinking and opportunity identification skills via entrepreneurship education programmes can — and should — therefore be undertaken to help promote entrepreneurship in society.

Educators and course planner have a key role to play in the stimulation of creativity and the creation of a climate conducive to creative thinking and idea generation. They also have a key role to play in determining the most appropriate techniques to do this (Baillie, 2006). In countries like Iran where most universities do not have lecturers with sufficient experience teaching entrepreneurship and/or sufficient expertise to do this (Karimi et al., 2010), there is thus a need for these teachers to be taught, themselves, and updated on the most effective methods for teaching entrepreneurship, stimulating creative thinking and encouraging university students to identify promising business opportunities.

# Chapter 7

## General Discussion

## 7.1. Introduction

Given that the results of each study have been discussed separately in Chapters 2 to 6 of this book, the present chapter goes a step further by discussing the main findings *together* in the light of the literature, theoretical implications, future directions for research and practical implications. To do this, the first section recaps how the results of the studies answered the research questions which motivated them. The findings are then discussed in light of the current literature and the general theoretical implications of the findings. The extension of the Theory of Planned Behaviour is discussed in relation to the present research, and suggestions for future studies are presented. Thereafter, some possible limitations on the conducted studies are addressed and translated into additional suggestions for further research. Attention is paid to particularly methodological issues when doing this. Finally, in the last part of this chapter, the practical implications of the conducted studies are discussed with a focus on entrepreneurship education and training.

## 7.2. Theoretical Background and Overview of Main Empirical Findings

### 7.2.1. Theoretical Framework

While entrepreneurship has been viewed as crucial to economic development and employment generation, particularly in developing countries like Iran, surprisingly little research has been conducted on those factors which influence the intention of the individual to start a business within such contexts (Karimi et al., 2010). Researchers and policy makers elsewhere have nevertheless sought to understand why some people decide to start a business and others do not. The results indicate that personality traits and socio-demographic characteristics, alone, cannot sufficiently explain the entrepreneurial intentions of individuals. Approaches based on attention to these factors are also not regarded as particularly useful for the stimulation of entrepreneurial intentions and training of entrepreneurship, moreover. It is very difficult to learn to become an entrepreneur according to these approaches, for instance, and the value of teaching and entrepreneurship training therefore not recognized within these approaches.

Recently, however, a number of scholars have argued that approaches which attend to personality traits and socio-demographic characteristics can still contribute to the field of entrepreneurship (Rauch & Frese, 2007; Baum, Locke & Smith, 2001; Zhao et al., 2010; Brandstätter, 2011). In recent studies, for instance, researchers have hypothesized that personality traits and socio-demographic variables can indirectly influence entrepreneurial intentions via the *antecedents* to entrepreneurial intentions (Fishbein & Ajzen 2010; Luthje & Franke, 2003).

In response to criticisms of both the personality traits and socio-demographic approaches to understanding entrepreneurial behaviour, researchers have turned to more cognitive models which are better able to handle the complexity of entrepreneurial intention and behaviour (Bridge et al., 2009). Unlike the personality trait and socio-demographic approaches, cognitive approaches emphasize the role of education and learning in the development of behaviour. In addition, cognitive models have been found to have considerably stronger predictive power than the other approaches in entrepreneurship research (Bridge et al., 2009; Gartner, 1985; Katz & Gartner, 1988). Most of the cognitive approaches also include elements of the personality trait and socio-demographic approaches and therefore call upon their strengths while also overcoming their deficiencies. We also therefore adopted a cognitive approach to the study of entrepreneurial intentions and entrepreneurship education in the present research project.

Among the cognitive models, one of the most widely researched approaches is the theory of planned behaviour (TPB) as originally presented by Ajzen (1988, 1991). This theory has been used to predict a wide range of human behaviours, including entrepreneurship (Fayolle et al. 2006). The capacity of the TPB to predict entrepreneurial intentions has been demonstrated in a number of studies (e.g. Krueger et al., 2000; Autio et al., 2001; Engle et al., 2010; Iakovleva et al., 2011).

According to Fishbein and Ajzen (2010), the TPB can serve not only gain a better understanding of determinants of behavioural intentions and behaviour and to design an intervention guided by that understanding but it also can be used as a suitable conceptual and methodological framework to evaluate the educational interventions. In light of the above and because entrepreneurship is planned behaviour and thus it is best predicted by entrepreneurial intentions (Kautonen, van Gelderen & Fink, 2013; Krueger et al., 2000), the TPB was considered a useful starting point for the present research endeavour.

The purpose of the present research endeavour was to investigate those factors which influence the entrepreneurial intentions of university students and the attitudinal antecedents to these intentions in an Iranian context. The TPB was taken as the starting point for this endeavour and attention thus paid to personality traits, socio-demographic characteristics and motivational factors. In doing this, the TPB was further used to evaluate the effects of entrepreneurship education on the entrepreneurial attitudes and intentions of higher education students. Within the TPB, intentions have been identified and shown to be the best predictors of actual behaviour. Intentions in turn are held to be a function of three basic determinants: attitudes towards the behaviour or, in the present context, the perceived attractiveness of becoming an entrepreneur; subjective norms or perceived social pressure to start (or not start) a business; and perceived behavioural control (PBC) of the perceived ease/difficulty of becoming an entrepreneur. These

three antecedents can in turn be influenced by exogenous factors such as personality traits, education and socio-demographic background characteristics. In other words, exogenous factors can *indirectly* influence behavioural intentions via mediating or moderating effects.

### 7.2.2. Main Empirical Findings

As stated in Chapter 1, the TPB is one of the most influential and widely researched models of behaviour and behavioural intentions. However, little empirical research has been conducted on the TPB and entrepreneurial intentions of higher education students in non-Western cultures and developing countries, where different cultural values might significantly impact upon entrepreneurial intentions and behaviours. In fact, we generally know very little about the contributions of cultural values at the level of the *individual* to entrepreneurial intentions and behaviours in either Western or non-Western contexts. And for this reason, scholars have repeatedly called for the study of just how cultural values influence the entrepreneurial perceptions and intentions of people in general and higher education students in particular (Liñan & Chen 2009; Iakovleva et al. 2011; Thornton et al., 2011; Siu & Lo 2011; Shinnar, Giacomini & Janssen 2013).

Given our interest in the influence of cultural values on the entrepreneurial perceptions and intentions of higher education students, the applicability of the TPB within an Iranian context (i.e., a developing, non-Western culture) was examined. In addition, the effects of two important cultural values — namely, individualism and collectivism — were examined. In the first empirical study reported on here. And the first three research questions addressed in the present research endeavour were therefore as follows.

**RQ1a:** *Are students' entrepreneurial intentions positively influenced by their attitudes toward entrepreneurship, subjective norms and perceived behavioural control in an Iranian context?*

**RQ1b:** *To what extent do cultural values influence students' entrepreneurial intentions via the components of the TPB?*

**RQ1c:** *To what extent do cultural values influence the strength of the relationships within the TPB?*

In Chapter 2 of this thesis, these research questions are answered. A structural equation model was created to investigate the nature of the relationships between the entrepreneurial intentions, the antecedents to these intentions and key cultural values for the TPB within an Iranian context. In line with the TPB, we indeed found positive effects of attitude towards entrepreneurship, subjective norms and PBC on students' entrepreneurial intentions. Evidence was thus found for the applicability of the TPB within a non-Western cultural context and thus the generalizability of the TPB to such contexts. However, the *magnitude* of the effects of the individual antecedents of entrepreneurial intentions varied in our study. Of the three antecedents

to entrepreneurial intentions included in our model, subjective norms proved *least* important for the prediction of entrepreneurial intentions. This shows Iranian students to draw relatively more on individual considerations than on social or normative considerations when it comes to entrepreneurial intentions. Within the context of our study, however, it was also possible that the influence of subjective norms on the entrepreneurial intentions of Iranian higher education students was more indirect (i.e., subjective norms influenced entrepreneurial intentions *via* attitudes towards entrepreneurship and PBC). In contrast, we found PBC to be the *strongest* predictor of entrepreneurial intentions for the Iranian students. In keeping with this, Autio *et al.* (2001) have argued that PBC is the most important factor when investigating entrepreneurial intentions and noted that the decision to start a business has more significant consequences than the decision to — for example — vote or lose weight. The latter endeavours are argued to require considerably less volitional control than starting a business. And the role of PBC may be even more marked within the developing context of Iran. Given unstable economic and political conditions, which are obviously unfavourable to entrepreneurial initiatives, confidence in one's ability to start and run a business can be expected to be a strong predictor of entrepreneurial intentions.

It is worth mentioning that the structural equation model used in our study explained 61% of the variance in the entrepreneurial intentions of the Iranian students. This is a very high percentage as most of the linear regression models applied in previous research to explain the variance observed in entrepreneurial intentions have explained less than 40% of the variance (Linan *et al.*, 2013).

With regard to research question 1b, higher levels of individualism resulted — as might be expected — in more positive attitudes toward entrepreneurship and PBC, which in turn resulted in more positive entrepreneurial intentions. Collectivism also contributed positively to the entrepreneurial intentions of the students but via their subjective norms: Higher levels of collectivism resulted in higher levels of concern for the opinions of others (i.e., subjective norms) and then to higher levels of entrepreneurial intentions. In the words of Bochner (1994): collectivists are more “sensitive to the demands of their social context and more responsive to the assumed needs of others” than non-collectivists. More generally, our results show the cultural values of students to shape their entrepreneurial perceptions and intentions.

With regard to research question 1c, partial support was found for the moderating effects of cultural values at the level of the individual for the relationships between the variables in the structural equation model based upon the TPB. As might be expected, individualism moderated the relationship between attitudes toward entrepreneurship and entrepreneurial intentions, such that the positive association was *stronger* when individualism was higher. In contrast, collectivism

did *not* moderate the positive relationships observed between the antecedents to entrepreneurial intentions and the entrepreneurial intentions of the students. These results suggest that the TPB may operate differently depending on the cultural value orientations of the individuals involved.

The presence of entrepreneurial role models is amongst the most important factors to play a role in the decision to become an entrepreneur (Lafuente et al., 2007; Bosma et al., 2012). Despite the importance of these role models, little is known about the mechanisms underlying their influence on the entrepreneurial intentions of students — particularly in developing countries. Gender is another socio-demographic factor which might influence the decision to become an entrepreneur. Lower entrepreneurial activity is known to occur among women than among men (Langowitz and Minniti, 2007), but we have little understanding of the underlying reasons for this (Ljunggren & Kolvereid, 1996). Furthermore, the majority of research on female entrepreneurship has occurred in Western countries such as the USA and UK (Ahl, 2002). To gain a more complete understanding of socio-demographic factors contributing to the entrepreneurial intentions of students, gender and role models were thus included in the research model. It has been suggested that socio-demographic variables like the presence of role models and gender may have an indirect effect on entrepreneurial intention, affecting more immediate antecedents (Fishbein & Ajzen 2010). Our next two research questions were therefore as follows.

**RQ2a:** *To what extent do entrepreneurial role models influence students' entrepreneurial intentions via the components of the TPB?*

**RQ2b:** *To what extent does gender moderate the relationships between role models and the components of the TPB as well as the relationships among the TPB components themselves?*

In Chapter 3, these research questions are answered and a contribution is thus made to the literature on entrepreneurial intentions by shedding light on the roles of socio-demographic variables in the formation of entrepreneurial intentions. Consistent with the TPB, the results of this empirical study showed the components of the TPB to *mediate* the influence of entrepreneurial role models on the entrepreneurial intentions of higher education students in Iran.

In contrast, no gender differences were found in the relationship between PBC — or what was found to be the strongest predictor of entrepreneurial intentions for the Iranian students in our previous study — and entrepreneurial intentions. That is, PBC was found to be an equally strong predictor of entrepreneurial intentions for male and female students when included in the present study. Once again, this finding may stem from the environmental conditions in Iran, which are not conducive to entrepreneurship. In such an environment, confidence in one's ability to start and run a business may be *critical* — for both men and women. Gender was nevertheless found to affect the other relationships within our model based upon the TPB, with attitudes



toward entrepreneurship being a weaker and subjective norms being a stronger predictor of entrepreneurial intentions for female as opposed to male students. For the female students in our study in Iran, thus, subjective norms proved particularly salient and thereby contributed greatly to their entrepreneurial intentions — presumably due to the person-orientation of these women, their need for affiliation and their relational needs. Attitudes toward entrepreneurship, in contrast, were more positive to start with among the male students relative to the female students in our study in Iran — presumably due to the instrumental orientations of the Iranian men and their need for independence and achievement. It can thus be concluded that gender plays a crucial role in the shaping of the entrepreneurial intentions of higher education students in Iran.

In addition, some interactions involving role models and gender were found. PBC and attitudes toward entrepreneurship were more strongly affected by the presence of role models for females than for males in our study. It is thus possible that Iranian women are more open and sensitive to input from others (i.e., role models) than men (BarNir et al., 2011). For this reason then, entrepreneurial role models can shape the entrepreneurial attitudes and self-efficacy of females more than the entrepreneurial attitudes and self-efficacy of males.

Entrepreneurship scholars have noted that personality characteristics have only been studied in a rudimentary fashion within the field of entrepreneurship research (Frese et al. 2007; Baron 2007). Earlier research focused on certain personality traits as the sole predictors of entrepreneurial intentions and behaviour. However, personality characteristics were found to have only limited predictive value. Therefore, some scholars have argued that personality may influence entrepreneurial outcomes, however not in isolation, but through more proximal factors such as motivational and perceptual factors (Baum, Locke and Smith, 2001; Simon and Houghton, 2002).

In addition to this, the individual is always surrounded by a range of contextual factors which can push and pull them in particular directions (Hisrich, 1990). A combination of both personal factors (such as personality) and contextual factors (such as perceived government support) may thus shape entrepreneurial intentions (Boyd & Vozikis, 1994). Social cognitive models such as the TPB have not yet combined these two groups of factors for better understanding the determinants of entrepreneurship (Burmúdez, 1999). In other words, investigations focused on the components of TPB as mediators of the relationships between personality and contextual factors and entrepreneurial intentions, have received scant attention. Accordingly, our third research question was as follows.

**RQ3:** *To what extent do personality characteristics and contextual factors influence students' entrepreneurial intentions via the components of the TPB?*

In Chapter 4, this question is answered and we thereby enhance our understanding of how personality characteristics and contextual factors affect the attitudes of students toward entrepreneurship and their PBC with regard to such. Mediation analysis using structural equation modelling with bootstrapping showed attitudes towards entrepreneurship and PBC to fully mediate the influences of personality characteristics (i.e., need for achievement, risk taking and locus of control) on entrepreneurial intentions. We thus have evidence that personality characteristics are important in the prediction of entrepreneurial intentions, but they have their effects through more proximal variables such as attitudes and PBC (Baron, Frese & Baum, 2007; Fishbien and Ajzen, 2010; Rauch & Frese, 2007a).

The results of this study also showed *only* the contextual factor of “perceived government support” to exert a significant *indirect* effect upon entrepreneurial intentions and then via only PBC and not attitudes toward entrepreneurship. This finding suggests that perceived contextual support may particularly affect the decision-making process which occurs between intention and behaviour. Increased contextual support may thus help students bridge the gap between entrepreneurial intention and behaviour with what ends up being a well-supported decision to start a business. During this decision-making stage, individuals are starting to concretely implement entrepreneurial actions and, because they want to implement these actions well in order to make the business succeed, they may be more sensitive to external support at this stage in the entrepreneurial process (Fini et al., 2012). Alternatively, it can be argued that attitudes toward entrepreneurship and PBC may be more influenced by support from the individual’s close environment (e.g., family and friends). The findings of our initial study (i.e., that presented in Chapter 2) provided evidence for this assumption as they showed attitudes toward entrepreneurship and PBC to be significantly influenced by subjective norms — namely, perceived support from close environment such as family and friends. Contrary to what we expected, the influence of the contextual factor of “perceived university support” on entrepreneurial intentions was *not mediated* by attitudes toward entrepreneurship and PBC but exerted a *direct* effect on entrepreneurial intentions. This means that students may be inclined to start a business regardless of their prior entrepreneurial attitudes when the contextual conditions at the university are viewed as favourable (i.e., a trigger effect occurs) (Luthje & Franke, 2003). Universities should thus pay greater attention to establishing conditions conducive to entrepreneurship.

In sum, although the comparison between personality and contextual factors is limited by the fact that the personality and the context are not entirely covered by the constructs included in the present research, the findings showed that for this sample of Iranian students the

personality characteristics compared to the contextual factors have higher effects on entrepreneurial intentions.

As mentioned in Chapter 1, little research has been conducted on the effectiveness of entrepreneurship education programmes, especially in developing countries including Iran. Moreover, the results of previous studies are inconsistent. Methodological limitations may account for these inconsistent results (von Graevenitz et al. 2010). And many researchers have therefore called for the more systematic evaluation of entrepreneurship education programmes (e.g., Fayolle et al., 2006; von Graevenitz et al., 2010). However, little agreement can be found on the most suitable conceptual model and best methods to assess the effects of entrepreneurship education programmes (Falkang & Alberti, 2000; von Graevenitz et al., 2010). Moreover, in previous studies, participation in elective versus compulsory programmes has not been distinguished (Oosterbeek et al., 2010). In addition, non-business students have received limited attention in previous studies (Lans et al., 2013); this is despite the fact that non-business students represent the bulk of young people pursuing entrepreneurship education programmes. All of the other published research on the effects of entrepreneurship education programmes has — to the best of our knowledge — been conducted in developed countries, moreover (e.g., Fayolle & Gailly, 2013; Fayolle et al., 2006; Oosterbeek et al., 2010; Peterman & Kennedy, 2003; Souitaris, Zerbinati & Al-Laham, 2007; von Graevenitz et al., 2010; Volery et al., 2013; Weber, 2012).

In our next study, we tried to fill this gap. And our fourth research question was therefore as follows.

**RQ4:** *Do current entrepreneurship education programmes at Iranian universities positively affect the entrepreneurial attitudes and intentions of students?*

In Chapter 5, this question is answered using the model proposed by Krueger and Carsrud (1993), Fayolle et al. (2006) and Fayolle and Gailly (2013) to evaluate the effectiveness of entrepreneurship education on the basis of the TPB. The effects of large-scale compulsory and large-scale elective entrepreneurship courses on students' entrepreneurial attitudes and intentions were investigated at six Iranian universities. According to the proposed model, if the course is effective, the values of the relevant components (i.e., attitudes, PBC, subjective norms and entrepreneurial intentions) should increase over time (i.e., at post-test relative to pre-test) for the participants in the education programme.

In this empirical study, we found that both elective and compulsory entrepreneurship education programmes positively influenced the participants' subjective norms and PBC. The significant increase in the mean value for subjective norms may reflect the emphasis within both programmes on teamwork (e.g., working together in teams of four to six to create business plans) and on giving students the opportunity to build a network with entrepreneurially-minded peers

and experienced entrepreneurs. A possible explanation for the positive contributions to PBC may lie in mastery experiences and vicarious learning from role models; most entrepreneurship education programmes emphasize "learning by doing" by having students write a business plan and work with actual entrepreneurs. In addition, the teachers tell success stories about entrepreneurs and provide role model by inviting successful entrepreneurs as guest speakers.

However, this study did not show a significant effect of either elective or compulsory entrepreneurship education programmes on attitudes toward entrepreneurship. Although this insignificant effect is not fully clear and therefore warrants future research, one plausible explanation might be that the students had relatively positive attitudes toward entrepreneurship to start with, left little room for increases. Another possible explanation is that attitudes are less malleable than — for example — PBC. Our results also indicated that the elective entrepreneurship education programmes but not the compulsory entrepreneurship education programmes significantly increased the entrepreneurial intentions of the students. The effects of the compulsory programmes on the entrepreneurial intentions of the students may have been insignificant precisely because participation was compulsory, as a comparison analysis showed. Alternatively, the students may have gained a realistic picture of both themselves and being an entrepreneur and decided, in this light, that they do not want to become an entrepreneur. In this sense, we need not conclude that the programmes did not affect the students' entrepreneurial intentions; the programmes may have effectively enhanced student awareness of entrepreneurship and thereby allowed them to effectively assess their futures as entrepreneurs.

In sum, this study contributes to our knowledge of entrepreneurship education by illuminating the effects of two types of programmes (i.e., elective versus compulsory programmes) on the entrepreneurial attitudes and intentions of students. The findings roughly correspond to those of other studies conducted using very different entrepreneurship education programmes. These could be: only compulsory entrepreneurship education programmes such as those studied by Fayolle and Gailly (2013) or Oosterbeek et al. (2010); entrepreneurship education programmes with multiple types of objectives, content and outlines like those studied by Souitaris, Zerbinati and Al-Laham (2007) or Volery et al. (2013); or short-term programmes such as those studied by Fayolle and Gailly, (2013) or Fayolle et al. (2006). Therefore, our study contributes something new by following the suggestions of Zhao, Hills and Seibert (2005) and Oosterbeek et al. (2010), who underline the need to evaluate the effectiveness of different types of entrepreneurship education programmes.

The competence of business opportunity identification has been identified as an essential competence of successful entrepreneurs (Detienne & Chandler, 2004). Within the field of entrepreneurship, opportunity identification is the ability to identify a good idea and transform it

into a business concept which adds value and generates revenues (Lichtenstein & Lumpkin 2005). In addition to entrepreneurial intentions, identifying a business opportunity is a prerequisite for starting a business: “To have entrepreneurship, you must first have entrepreneurial opportunities” (Shane & Venkataraman, 2000, p. 220). In fact, the formation of new business firms is based on both entrepreneurial intentions and opportunity identification. Both aspects must be present for business formation to take place (Zander, 2004). Some people may consider entrepreneurship but, not detecting a viable opportunity, decide to give up on entrepreneurship and pursue a salaried position instead. Entrepreneurship education programmes should therefore include attention to both entrepreneurial intentions and business opportunity identification.

Entrepreneurship education should enhance the capacity for opportunity identification (Kourilsky, 1995; Ray 1990; Morris et al., 2013; Volery, 2013), but very little effort has been devoted to date to the training of individuals to discover and create new business opportunities (Neck & Greene 2011). In the study by Volery and colleagues (2013), moreover, entrepreneurship education did not increase students’ ability to identify business opportunities. In our previous study, the results of interviews with some of the students and teachers following intervention also indicated that the capacity for opportunity identification was often ignored or received insufficient attention. And inspection of the syllabi for existing entrepreneurship courses in Iran similarly showed opportunity identification to receive little or no attention.

Both researchers and educators struggle with how the capacity for opportunity identification can be enhanced in entrepreneurship education (Neck & Greene, 2011; Saks & Gaglio, 2002). There have thus been calls for more research on fostering this competence in the classroom (e.g., Rae, 2003; Saks & Gaglio, 2002). According to the entrepreneurship literature, opportunity identification can be considered a domain-specific form of creativity (DeTienne & Chandler, 2004; Ucbasaran et al., 2009). And this means that the theories and techniques from the creative domain and creativity education can probably be applied to foster opportunity identification. Some scholars (Carrier, 2007, 2008; DeTienne & Chandler, 2004; Gundry & Kickul, 1996) have further argued along these lines that, in order to foster the ability of students to identify business opportunities, entrepreneurship education should focus on the promotion of divergent thinking and *idea* generation. Accordingly, in our last empirical study, we decided to redesign an entrepreneurship course and focus on fostering the ability of students to think divergently and identify new business opportunities. And our final research question was therefore as follows.

**RQ5:** *Does an entrepreneurship course aimed at idea generation foster the ability of students to think divergently and identify business opportunities?*

Following participation in the redesigned course, students indeed showed more divergent

thinking and *also* perceived themselves as more creative than students who did not participate in the course. The results also showed the course to significantly enhance the ability of the students to generate not only a greater number of business ideas but also more innovative business ideas when compared to a control group which showed no such changes. A clear link between training and the ability to generate innovative business ideas in the entrepreneurial classroom has thus been demonstrated. Opportunity identification is thus learnable, and individuals can thus be taught to identify business opportunities.

### **7.3. General Theoretical Implications**

The Theory of Planned Behaviour (Ajzen, 1988, 1991) was used in the studies reported on in Chapters 2, 3, 4, and 5 to gain insight into the entrepreneurial attitudes and intentions of students and to evaluate the effectiveness of entrepreneurship education programmes for enhancing these. The findings of these studies have several theoretical implications. In general, the present research contributes to the theory of planned behaviour by showing its capacity to predict the entrepreneurial intentions of students in an Iranian context. The present findings also contribute to the theory of planned behaviour by demonstrating the effects of previously little studied exogenous influences on the entrepreneurial attitudes and intentions of students (i.e., elements of the theory of of planned behaviour).

The present findings also contribute to our understanding of entrepreneurship education by providing support for the application of the theory of planned behaviour to evaluating entrepreneurship education programmes and showing entrepreneurship education to successfully foster the development of entrepreneurial attitudes and intentions on the part of university students in Iran.

In the studies described in Chapters 2-5, the roles of factors which are conceptually closely related to entrepreneurial intentions were examined: demographic, personality, socio-cultural and cognitive factors. A model based on the theory of planned behaviour was tested for the prediction of students' entrepreneurial intentions within the context of a non-Western, developing country. Both cognitive and motivational factors as well as cultural values, role models, gender and personality characteristics were included in the model. And the theoretical insights gained from this endeavour have deepened our understanding of the mechanisms underlying entrepreneurial intentions. The findings nevertheless show that the socio-demographic and personality factors researched here cannot fully explain the entrepreneurial attitudes and intentions of students and that additional individual, organizational, institutional and other environmental factors must also play a role in entrepreneurial intentions and entrepreneurship.

Before considering the further implications of the present results and what other factors should be considered to promote our understanding of planned behaviour and entrepreneurship, we will briefly summarize the specific theoretical insights provided by the present research.

### 7.3.1. Chapter 2

First, we set out to apply the TPB in an Iranian context and thereby investigate the effects of cultural values within a model derived from the theory (see Chapter 2). From a theoretical perspective, our findings provide support for the applicability of the TPB in a collectivist, non-Western country context. All three of the motivational antecedents included in the TPB (i.e., subjective norms, attitudes toward entrepreneurship and perceived behavioural control) proved important for intention formation but to different degrees. The latter finding, namely a different pattern of determination for entrepreneurial intentions, suggests that the TPB does not operate the same in all situations and that its operation may thus vary depending on the context and behaviour in question.

Fishbein and Ajzen (2010) recently pointed out that although the TPB has been shown to be applicable in different cultural contexts, it can nevertheless be expected that the effects of and interrelations among the components of the TPB may vary across cultures. Our findings support this observation. In our study, for example, PBC was found to be the strongest predictor of entrepreneurial intentions while in Spain and the UK attitudes toward entrepreneurship have been found to be the strongest predictor (Linan et al., 2013).

A challenge raised by our results and those of other studies for the TPB is further specification of the role of subjective norms. In most studies, including the present one, this component is found to be a weak predictor of behavioural intention. According to some scholars, the consistently weak influence of subjective norms within the TPB suggests that they may directly affect personal perceptions and thereby entrepreneurial intentions only *indirectly* (e.g. Liñán & Santos, 2007). Stated differently: positive values transmitted by “important others” can prompt more favourable personal perceptions (Cooper, 1993). And when we further explored the relationships between subjective norms and attitudes toward entrepreneurship and PBC, we indeed found them to be significant. This finding is an important finding but in need of further testing and replication. It is thus suggested that future research should take into account the indirect effects of subjective norms on entrepreneurial intentions via attitudes toward entrepreneurship and PBC when applying the TPB.

Stepping back, our examination of the influence of cultural values at the level of the individual and incorporation of this information into a cognitive model of entrepreneurial intention has contributed to a better understanding of the precursors to entrepreneurial

intentions. Our findings show a flow from relatively stable, abstract cultural values to more concrete, domain-specific entrepreneurial attitudes to entrepreneurial intentions in the end — which also provides support for cognitive hierarchy theory (Homer & Kahle, 1988). According to this theory, values only influence behavioural intentions and behaviour *indirectly* via attitudes. In other words, values are proximally related to attitudes and distally related to behavioural intentions and behaviours.

### 7.3.2. Chapter 3

In the present research, we also incorporated entrepreneurial role models and gender into the model based upon the TPB (see Chapter 3). The results of the study in which we did this have several theoretical implications. First, we found role models to only *indirectly* influence entrepreneurial intentions via the antecedents to intention. The mediated effect of role models thus provides support for the TPB assumption that additional person/situational exogenous variables such as role models will *indirectly* affect individual intentions (e.g., Ajzen, 1991; Kolvereid & Isaken, 2006).

A second theoretical implication stems from our finding that gender *moderates* the strength of the relationships between motivational factors and entrepreneurial intentions. This finding is in keeping with Fishbein and Ajzen's (2010) assumption that exogenous variables such as gender will influence the relative emphasis which people place upon the attitudinal and normative determinants of behavioural intentions. The present findings also extend our understanding of the role of gender in entrepreneurship. In the present study, subjective norms were found to be important for female students but not male students; subjective norms played no significant role for male students. In contrast, attitudes toward entrepreneurship proved relatively more important for the male students in our study than for the female students. These findings suggest that male students focus on the instrumental outcomes of entrepreneurship while female students focus on the social considerations and opinions of others with regard to entrepreneurship. Moreover, entrepreneurial role models were generally found to be more important for female students than for male students. This finding represents a new contribution to the study of entrepreneurship. It was also found that attitudes towards entrepreneurship and PBC were more strongly influenced by role models for females than for males. Significant mediation *and* moderation effects were thus found for a model of entrepreneurial intention based upon the TPB. In conclusion, from a theoretical perspective, the results of the present study provide evidence that the relationships posited in the theory of planned behaviour can benefit from the inclusion of moderators and mediators that are relevant for a particular behaviour in a particular context.



### 7.3.3. Chapter 4

We next incorporated personality characteristics and perceived contextual support into the model derived from the TPB to assess the influence of these factors on the entrepreneurial intentions of Iranian students (see Chapter 4). The model is multidimensional, which means that factors examined in isolation in previous studies can now be analysed in conjunction with each other to determine their joint effects on entrepreneurial intentions and the antecedents to these. In particular, our results provide evidence for the integration of personality characteristics into socio-cognitive theories such as the TPB and suggest that these theories should acknowledge more explicitly the possibility of indirect effects of personality characteristics on behavioral intentions, and so makes an important contribution to this literature by explicating and testing such mediating relationships.

A challenge for the TPB is the assumption of sufficiency. Within the TPB, it is assumed that additional predictive factors can only affect intentions (and thus behaviour) if — and only if — they influence one or more of the antecedents to intention. The assumption of sufficiency states that the inclusion of additional factors at this level should not improve the prediction of either intention or action. However, this assumption has repeatedly been challenged (see, for example, Conner & Armitage, 1998). And the results of our studies indicate that the assumption of sufficiency does not hold for understanding the determinants of entrepreneurial intentions among higher education students in Iran. As already pointed out, our results showed perceived university support to *directly* influence the entrepreneurial intentions and explain an additional 2% of the variance observed for the entrepreneurial intentions of the students in the study. Some scholars therefore argue that the direct effects of contextual factors on entrepreneurial intentions should be incorporated into models of entrepreneurial intention (e.g., Luthje & Franke, 2003). Our position — in keeping with that of Ajzen (2011) — is that additional predictors should only be incorporated after careful study and discussion (i.e., sufficient high-quality evidence to justify their inclusion is found). Additional study is thus needed to clarify the role of environmental factors in models of entrepreneurial intention derived from the TPB.

### 7.3.4. Chapter 5

In the next step in our study, we assessed the effects of entrepreneurship education programmes on the entrepreneurial attitudes and intentions of higher education students (see Chapter 5). From a theoretical perspective, this study contributes to the TPB by examining whether the framework is useful for the assessment of entrepreneurship education programmes and thus documenting the effects of entrepreneurship education as an exogenous influence on entrepreneurial intention and its antecedents. The TPB was found to provide a promising

framework, and elective programmes were found to yield better results than compulsory programmes.

### **7.3.5. Chapter 6**

To round off our analysis and explanation of the effects of entrepreneurship education among higher education students in Iran, we were among the first to empirically study the possibility of developing students' ability to identify business opportunities via participation in an entrepreneurship course specifically designed to do this (see Chapter 6). Entrepreneurship scholars have called for more research on the fostering of this competence in the classroom (e.g., Saks & Gagilo, 2002; Rae, 2003), and our research fulfils this need. Theories which emphasize the importance of opportunity identification and creativity for entrepreneurship guided the redesign of an entrepreneurship education programme and received support. Our results show that creativity models can be applied to promote opportunity identification and thus effective entrepreneurship education. More specifically, our results indicate that the idea generation training can effectively promote both divergent thinking and the identification of business opportunities by students.

## **7.4. Extending the Theory of Planned Behaviour**

The most convincing evidence for understanding entrepreneurial intention is provided by the theory of planned behaviour (Autio et al., 2001; Egel et al., 2010; Iakovleva et al. 2011; Krueger et al., 2000; Moriano et al., 2011). Unlike other models of intention, the TPB offers a coherent and widely applicable theoretical framework for understanding and predicting entrepreneurial intention. It has done this by taking not only personal but also social factors into account (Krueger et al., 2000). In contrast to other available models, the TPB has received support for the prediction of a wide range of behaviours which include entrepreneurship but also other planned behaviour (see Armitage & Conner, 2001, for review). In addition to this, the TPB gives us an indication of how external factors may influence entrepreneurial intentions and behaviour. For example, the presence of entrepreneurial role models has been shown to enhance perceptions of being entrepreneurial as a feasible endeavour (Delmar, 2000; Krueger, 1993b, 2000; present results).

Despite the widespread applicability of the TPB and its adoption in more than 1000 studies of different types of planned behaviour, the theory is not free of criticism.

### **7.4.1. Implementation Intention**

According to the TPB, strong goal-oriented intentions (e.g., "I intend to start a new business!") are the major predictor of subsequent goal-directed behaviour (e.g., Ajzen, 1991; Armitage & Conner,

2001). However, goal-oriented intentions have been found to account for less than one third of the variance in the relevant target behaviour (Sheeran, 2002; Webb & Sheeran, 2006). In other words, once a goal has been set, there is no guarantee that steps will also be undertaken to achieve it. Important goals are formulated all the time but with no real intent to realize them in many cases. Consider, for example, the new year's resolutions of so many stop smoking or lose weight. Despite strong intentions, these routinely fail to develop or even take shape (i.e., result in specific steps to be taken).

In many cases, people have good reason for their delay of action with regard to an identified goal (Brenner, Pringle & Greenhaus, 1991; Dimov, 2007). With regard to the intention to start a business venture, for example, the intention may not be acted upon due to lack of support (i.e., financial, social or other resources), insufficient qualification (i.e., skill or capacity) or cognitive dissonance (i.e., the conflict between what individuals want and their attitudes and beliefs). Entrepreneurial intention, in other words, does not always lead to entrepreneurial action (Carsrud & Brännback, 2011). A strong (goal) intention is thus a necessary but not sufficient prerequisite for an action as there might be several impediments along the way (Gollwitzer & Oettingen, 1998). And one may have trouble choosing from alternative ways to act upon the goal intention (Gollwitzer & Brandstätter, 1997).

This lower predictive power of the TPB with respect to the actual occurrence of intended behaviours has led to criticism of the approach for not providing sufficient explanation of the processes which lead from intention to behaviour (Bagozzi, 1992; Eagly & Chaiken, 1993). The TPB has thus been criticized for concentrating on the motivational phase of the action process at the cost of attention to the volitional phase of actual performance and thus the translation of intention into behaviour (e.g., Conner & Norman, 2005; Renner & Schwarzer, 2003). The TPB also does not give us an explanation of why people do not always behave in accordance with their intentions. Especially in the case of entrepreneurship, which is a complex planned behaviour, other factors may thus be important for the transition from intention to behaviour.

One concept which may help us bridge the gap between entrepreneurial intention and behaviour is *implementation intention* (Gollwitzer, 1993). According to Gollwitzer (1999), implementation intentions or plans with regard to where, when and how to perform an intended behaviour are required to span intention-behaviour gap. Unlike intentions — which merely specify a desired end-state (e.g., “I intend to achieve Z”), implementation intentions specify the where, when and how of achieving that state (e.g., “If I am in situation X, then I will perform goal-directed behaviour Y”; Gollwitzer, 1999). In the case of entrepreneurship, the implementation intention can, for example, be: “I intend to start my own business once I have completed my studies.”

As Ajzen, Csasch and Flood (2009: 1356) state, “implementation intentions may be effective because they create commitment to the intended behaviour”. Scholars indeed believe that the concept of implementation intention or commitment can be seen as the missing link between intention and behaviour (Fayolle, Basso & Tornikoski, 2011). The formation of goal intentions precedes and justifies the formation of implementation intentions, and, conversely, latter promotes and supplements the former (Gollwitzer, 1990, p. 61). The purported relationship between goal intentions and later implementation intentions has also received empirical support (e.g., Brandstätter et al., 2003). Ever since the introduction of implementation intentions as a strategy to promote goal-directed action (Gollwitzer, 1993, 1999) and bridge the gap between intentions and behaviour, evidence has been gathered for many domains of behaviour: consumer behaviour (Fennis et al., 2011), job seeking (van Hooft et al., 2005) and health-related, academic or prosocial behaviour (see Gollwitzer & Sheeran, 2006, 2009). In an older experimental study by Orbell et al. (1997), moreover, individuals with implementation intentions were almost twice as likely to perform the intended behaviour as individuals with similar scores on the components of the TPB but no implementation intentions. Little research has looked explicitly at implementation intentions in relation to entrepreneurial intentions and entrepreneurial behaviour, however, which makes this a promising direction for future entrepreneurship research.

#### **7.4.2. Past, Present and Future Behaviour**

Among the most commonly recommended variables for addition to the TPB are the past and present behaviour of the individual (Connor & Armitage, 1998). A number of studies have shown both past and present behaviour to successfully predict not only behavioural intention but also future behaviour (Armitage & Conner, 2001; Bamberg et al., 2003; Conner & Armitage, 1998; Sutton, 1998). Past and/or present behaviour often show a *direct* link to the future actions of the individual and have been found in many cases to be the *strongest* predictor of future action — over and above the effects of TPB variables (Armitage & Conner, 2001; Conner & Armitage, 1998). TPB variables may sometimes *mediate* the effects of past and present behaviour on behavioural intention and future behaviour (Armitage & Conner, 2001) and, in any case, past and present behaviour should be incorporated as additional variables into models based upon the TPB (see Sandberg and Conner, 2008, for review). Past and/or present behaviour may also *moderate* the link between intention and behaviour within the TPB, but further research is needed to gain greater insight into these effects.

## 7.5. Limitations and Suggestions for Future Research

While the studies reported on here have contributed to our understanding of students' entrepreneurial attitudes and intentions as well as the evaluation and improvement of entrepreneurship education in a developing country, some limitations on the studies can be pointed out in order to help guide future research and some promising directions for future research highlighted.

First, the studies reported in Chapters 2- 4 were all cross-sectional. The findings from these studies thus provide only a "snap shot" of the entrepreneurial intentions of higher education students studied in an Iranian context. The direction of causality between the variables in the models used in the studies is therefore not certain (Maxwell & Cole, 2007; MacKinnon, Coxé & Baraldi, 2011). It is may possible, for example, that a more positive entrepreneurial intention *leads* to more positive entrepreneurship attitudes which, in turn, lead to higher values for certain personality characteristics. Although our model of entrepreneurial intention and behaviour has a solid theoretical foundation and the assumption that exogenous variables — such as cultural values and personality characteristics — shape attitudes and thereby behavioural intentions in the end, is coherent with the literature and other mediation models are theoretically less plausible, we reversed the causal paths within our model in the analyses summarized in Chapter 4. The results showed a better fit for the original model in which it is assumed that exogenous variables and personality traits in particular influence entrepreneurial intentions via entrepreneurial attitudes and not vice versa (i.e., entrepreneurial intentions influence entrepreneurial attitudes and thereby some of the exogenous variables included in the model). Longitudinal study is nevertheless needed to trace the influence of exogenous variables and the changes in the components of the TPB and entrepreneurial intentions over time.

Via longitudinal study and thus more than just a "snap shot" of entrepreneurial intentions, the effects of such intentions on the actual occurrence of entrepreneurial behaviour can also be documented. The link between entrepreneurial intention and behaviour is obviously crucial, but it has been studied even less than the link between the antecedents to intention and entrepreneurial intentions. Future research should thus turn to the intention-behaviour link within the entrepreneurial process and entrepreneurship education, which may require a longitudinal approach.

A second limitation is that the data which we collected was all self-report data. The questionnaire used to assess entrepreneurial attitudes, intentions, socio-demographic and personality factors proved reliable and valid. And self-report data is almost always used to collect information on the background, cognitive and intentional components of the theory of planned

behaviour due to their practical advantages. However, self-report data is known to be susceptible to bias (Bernard, 2006). What people say they do and what they do may differ sometimes. Respondents may simply forget past behaviour and therefore underestimate it or simply not report it for reasons of social desirability (i.e., trying to answer as they think they are expected to, wanting to be liked). All of this may heavily depend upon the behaviour in question.

In the present research, we tried to minimize possible bias and other common method variance issues in several ways (Podsakoff et al., 2003; Podsakoff et al., 2012). First, we informed the participants that all the data would be made anonymous and point out that it would only be shared in an aggregated form. We also advised the participants that there are no right or wrong answers to the questions and explained the importance of providing answers which were true and as accurate as possible by encouraging the students to respond quickly and spontaneously to the questionnaire items. Perhaps more importantly, proximal separation was used by placing the questions related to the predictor variables and outcome variables in different parts of the survey instrument (Podsakoff et al. 2003). This procedure can limit the recall, salience and relevance of previous responding during later responding (Podsakoff et al., 2012). Finally, questionnaire items concerned with same construct were distributed throughout the questionnaire — which addressed many constructs — and therefore not likely to be responded to on the basis of rote memory (i.e., by simply recalling one's previous response to a similar item).

It is nevertheless unlikely that all common method bias was eliminated from our study, which means that this remains as a possible limitation. In future research, other data collections methods should be used and thus different types of data collected in order to triangulate different perspectives on the entrepreneurial intentions and education respondents. In particular, classroom observations combined with interviews may help us gain greater insight into the influences of educational practices on entrepreneurial intentions and behaviour.

Yet another — third — limitation on the present set of studies is the generalizability of the results found in the Iranian context to other contexts and particularly other non-Western cultural contexts such as those of China and Turkey. While we do not have grounded reasons to expect significant differences to exist (i.e., our findings to not generalize to other non-Western cultures), care must nevertheless be taken when attempting to generalize these results beyond the Iranian context. We therefore recommend that future research replicate the present studies using a sufficiently large, international sample which also includes a variety of non-Western cultures. When replication proves feasible, this will validate the findings of the present research endeavour and allow us to draw upon in the other cultural contexts.

It should also be mentioned in this light that our sample was composed of students participating in entrepreneurship courses at public universities in Iran. Our findings may therefore

not generalize to other universities and institutes of higher education in Iran. Iran has a total of some 2390 public and private universities and institutes of higher education with over four million students registered at these institutions. The students in our study may therefore not be representative of *all* Iranian university students, but they did they come from all over Iran and were selected from universities with more than 100,000 students attending them. Future research should nevertheless aim to use a larger, randomly selected and thus more representative sample of students from both public and private universities but also other institutes of higher education in Iran.

A fourth potential limitation on the present research is only limited inclusion of the many personal, institutional and environmental factors which can influence entrepreneurship (Baum et al., 2001; Frese, 2009; Hmieleski & Baron, 2009). We investigated several personal and socio-cultural factors but acknowledge that these factors, alone, cannot fully explain the entrepreneurial attitudes and intentions of higher education students in Iran. Future studies should therefore investigate the impact of other personal, socio-cultural and environmental factors on entrepreneurial intentions and behaviours. Future studies might explore particularly the effects of additional cultural values, religious values, personality traits and socio-demographic characteristics on entrepreneurial attitudes, intentions and behaviour.

In the fourth empirical study in which the effects of different entrepreneurship courses are compared (Chapter 5), it is possible that the data contains some “noise” and therefore represents a fifth limitation on the present research. The entrepreneurship education programmes in our study followed a common outline, had similar content and shared key instructional features; there were nevertheless a number of factors which could have created some “noise” in the data. One such factor is the large number of instructors involved in most of the programmes and varying teaching methods used from course to course. For future research, it is therefore recommended that the theoretical framework put forth here be used to assess the effects of the specific characteristics, design elements, contents and teaching approaches used in the entrepreneurship courses on entrepreneurial attitudes and intentions and other entrepreneurial outcomes.

In the study of efforts to promote better business opportunity identification among students (Chapter 6), we also only assessed the overall effectiveness of the entrepreneurship course as a package. For greater training efficiency in the future and the development of top curricula, however, the most effective exercises and elements from these exercises should be identified. Future research should also strive to include both treatment and control groups with students randomly allocated to these groups. Such a true experiment will then provide even more reliable results than the present experiments.

Sixth, the last empirical study (Chapter 6) showed that students can be trained to generate new business ideas; there is nevertheless a substantial distance between opportunity identification and turning this into a successful enterprise. To travel this distance, students must acquire other skills and abilities as well. Good interpersonal and organizational skills, for example, are needed to start a business (see Man et al., 2002). Future research should therefore investigate how to foster these competencies in addition to the ability of students to identify new business opportunities.

Seventh, demonstrations of the impact of implementation intentions within the field of entrepreneurship are largely absent and this was also the case for the present research. Implementation intention nevertheless merits attention as the missing link between entrepreneurial intentions and behaviour. As Krueger (2007) states, moreover, it is certainly important that the distinction between *goal* intention and *implementation* intention be noticed: Is someone's "entrepreneurial intention" a goal intent (they intend to begin the process) or an implementation intention (they intend to actually get the venture launched)? Recently within the field of entrepreneurship education, Fayolle (2013) has called for more research drawing upon "implementation intention theory" (Gollwitzer, 1999). Drawing on this, future research should determine if the relationship between entrepreneurial intentions and behaviour is mediated by implementation intentions and, if so, just how the formulation of when, where and how facilitates this.

Eighth and with respect to the prediction of future behaviour by past and present behaviour, this process was not examined here. Past behaviour has nevertheless been shown to influence entrepreneurial intentions, as might be expected (Carr & Sequeira, 2007; Goethner et al., 2011). Whether present behaviour *directly* affect entrepreneurial intentions and future behaviour or the components of TPB perhaps *mediate* the effects of present behaviour on entrepreneurial intentions and future behaviour has yet to be determined. To gain insight into this aspect of planned behaviour, future research might approach successful entrepreneurs and study how their present entrepreneurial behaviour influences their forthcoming entrepreneurial intentions and future behaviour. In such a manner, the exact nature of the link between entrepreneurial intention and behaviour can be empirically documented along with how it is mediated and/or moderated by other factors.

Finally, there is an important avenue of study for entrepreneurship education researchers to pursue in the future and that is the design and evaluation of interventions aimed at helping graduates act upon their entrepreneurial intentions. According to Fishbein and Ajzen (2010), the TPB can also be used to evaluate the effectiveness of interventions designed to help people carry out existing intentions. Implementation intention interventions should deal with individuals who



already have the intention to start a business but are not sure how to do it or have found it difficult to carry out their intentions. Lack of internal factors (e.g., skills and ability) or the influence of external control factors (e.g., bureaucratic barriers, insufficient social support) may prevent people from carrying out their intentions. In such instances, an intervention is thus needed to provide these people with the necessary skills and resources to overcome internal and external obstacles. At other times, however, the people may have the intention and also the necessary prerequisites but nevertheless fail to act upon their intentions. In these instances, inducement to form an implementation intention is called for; these people must be helped to specify the where, when and how for carrying out their intentions and thus be given structure (Fishbein & Ajzen, 2010). In future research, interventions should thus be developed to help students and other potential entrepreneurs act upon their entrepreneurial intentions and the effectiveness of these interventions evaluated.

## 7.6. General Practical Implications

The results of the studies reported on here have several important practical implications for entrepreneurship education and training.

First, in our first empirical study (Chapter 2), evidence was found that the three antecedents to entrepreneurial intentions — namely, attitudes towards entrepreneurship, subjective norms and PBC — play significant role in the development of entrepreneurial intentions among Iranian higher education students. These findings suggest that decision makers and entrepreneurship educators should work to enhance these motivational factors and thereby increase the entrepreneurial intentions of students. Offering an entrepreneurship course which only involves the production of a business plan is not enough. It may be useful to increase PBC, but this will most likely not affect attitudes toward entrepreneurship or the subjective norms of students with regard to such (Carrier 2005; Linan et al., 2011). Content aimed at increasing all three of the antecedents to entrepreneurial intentions should therefore be developed.

Unfortunately, we still know very little about methods to improve PBC for entrepreneurship and particularly methods to promote more positive attitudes and subjective norms. A wide range of pedagogical approaches and instructional methods is available within the field of entrepreneurship education (Carrier, 2007; Hindle, 2007). These include business plans, business internships, awareness seminars, teamwork, role playing, entrepreneur guest speakers, business games and other teaching tools which might also be appropriate to promote the antecedents to entrepreneurial intention (Souitaris et al. 2007; Mueller 2011; Weber 2012). A challenge for future research is to thus document the utility of various instructional methods and

approaches for maximizing the antecedents to entrepreneurial intention and thereby the entrepreneurial intentions.

At the same time, policy makers must realize that government initiatives can only promote business formation when initiatives affect the attitudes, subjective norms and PBC of young people and thereby motivate them to pursue a promising enterprise. The availability of funds, subsidies, reduced bureaucracy, fewer regulations and limited rules for starting an enterprise may certainly convey the message that becoming an entrepreneur is valued by both government and society. And then, in turn, student awareness of the support of entrepreneurship by government and society may foster more positive subjective norms and attitudes among them with regard to entrepreneurship. As the results presented in Chapter 4 indicated, these initiatives can also give students the confidence to step into an uncertain occupation like entrepreneurship by increasing their PBC.

A second practical implication provided the present research is that gender moderated the relationships between — on the one hand — subjective norms and attitudes and — on the other hand — entrepreneurial intentions: Attitudes toward entrepreneurship were a weaker predictor and subjective norms a stronger predictor of entrepreneurial intentions for female students than for male students. This means that educators should recognize that 1) modifying attitudes towards entrepreneurship may produce larger increases in entrepreneurial intentions for males relative to females and conversely 2) modifying subjective norms may produce larger increases in entrepreneurial intentions for females relative to males. In other words, male students are driven more by instrumental factors while female students are driven more by interpersonal and social factors. It is therefore suggested that at least in single-sex universities, the entrepreneurship teaching methods and curricula should be adapted to the gender of the student population.

Our results also showed PBC to contribute most to the prediction of entrepreneurial intentions for both males and females. The practical implication of this finding is that increasing PBC should be spotlighted in entrepreneurship education programmes for both males and females.

The present findings further suggest that the presence of entrepreneurial role models is important for fostering positive attitudes towards entrepreneurship, positive subjective norms and even promoting increased PBC among higher education students in general and female students in higher education in particular. Entrepreneurship education and training programmes should therefore consider the inclusion of contact with entrepreneurial role models as part of their curricula. Educators can invite entrepreneurs as guest speakers but also to participate in question and answer sessions, relate their success stories and share their entrepreneurial

experiences in general. Students can be expected to benefit from such vicarious learning experiences with more PBC and entrepreneurial intentions as a result.

A third core implication of the present results for entrepreneurial educational practice pertains to the role of such personality characteristics as locus of control, risk-taking and especially the need for achievement as described in Chapter 4. These factors significantly influenced the entrepreneurial intentions of students via the attitudes toward entrepreneurship and PBC of the students. Educational policy makers and universities should therefore attend to these factors when developing educational programmes to promote entrepreneurship. We suggest that students with higher levels of these personality characteristics be identified and encouraged to take part in entrepreneurship programmes. A university might base its selection process for entrepreneurship courses at least in part upon information provided by students with regard to their personality characteristics and entrepreneurship preferences (Luthje & Franke, 2003).

The observed effects of perceived university support on the entrepreneurial intentions of the students also suggest that universities should provide more extensive and possibly more intensive entrepreneurship education. Not only can they impart the knowledge and skills needed to start a new business in such a manner, they can also create an atmosphere in which students are clearly inspired to generate new ideas, identify promising businesses opportunities and pursue these in the form of a business enterprise. In addition to offering extensive and intensive entrepreneurship courses, a number of other activities should be arranged to promote entrepreneurship among higher education students. These activities could include, for instance, establishing incubators located on campuses, using role models in teaching, establishing entrepreneurial support networks, and organizing business plan competitions.

In light of the documented effects of perceived government support on the PBC of students, government should also consider a number of concrete measures. To start with, both financial and non-financial support can be provided to stimulate the PBC of potential entrepreneurs and thus students as well. Financial support can be given in the form of loans/credits with low interest rates but also tax incentives and exemptions. Non-financial support can be provided in the form of business development services, advisory/ consultancy services, mentoring, technical assistance, and marketing assistance. In such a manner, the feasibility of starting a business can be maximized and the PBC of potential entrepreneurs presumably enhanced as well.

Fourth, we found entrepreneurship education to positively influence both the subjective norms and the PBC of students. We take this as evidence that some components of entrepreneurship can be explicitly taught and strengthened. This should come as good news for

governments, universities and colleges but also private organizations which have heavily invested in the development of entrepreneurship education programmes over the past several decades. Public policy makers and education decision-makers can thus make future funding decisions of relevance for entrepreneurship education with greater confidence now.

The present research further indicated that compulsory courses did not increase entrepreneurial intentions significantly. This insignificant may obviously be due to the so-called sorting effect of such courses (Weber, 2012; von Graevenitz et al., 2010). During these courses, students gain information about entrepreneurship, themselves and what it takes to be an entrepreneur. In light of this information, they may decide to pursue a career as an entrepreneur or that they do not want to become an entrepreneur after all. In this sense, a compulsory entrepreneurship course can be considered a way of informing students about future career options and helping them select a suitable career path for themselves. Entrepreneurship education can thus minimize the risk of making the “wrong” career decision, which can be costly. In addition, politicians can then subsidize promising new ventures and entrepreneurs in a more targeted manner and thereby reduce the risk of wasting public resources (Weber, 2012).

As already mentioned, participation in elective entrepreneurship courses — in contrast to participation in compulsory course — positively contributed to the entrepreneurial intentions of the participants. This means that policy makers, university faculties and course planners should recognize the differential effects of different types of entrepreneurship education programmes and that the effects will not be the same across all programmes. Policy makers and instructors who want to produce more and better entrepreneurs should also keep in mind that voluntary participation in what is thus an elective programme/course will yield better results than required participation in what is a compulsory programme/course.

Finally, we presented evidence that the incorporation of idea generation training and creativity exercises into a classroom entrepreneurship course can significantly enhance students’ ability to generate not only more business ideas but also more innovative business ideas. While the competence-based approach which we developed for the training of these and other abilities is still in the early stages, the initial research results already provide valuable insights for the teaching of entrepreneurship and promotion of entrepreneurial competence. In particular, this study has practical application for educators and course planners in ways of fostering the competence of students in identifying business opportunities. Policy makers and educators should also keep the preceding competencies in mind when developing and implementing entrepreneurship education programmes: New businesses require — among other things — entrepreneurial intentions, promising opportunity identification and concrete implementation intentions. Entrepreneurship education programmes should thus address both entrepreneurial

intentions and opportunity identification but also — further down the road — implementation intentions. Educators and course planners may want to adopt the framework for entrepreneurship education developed here in order to help them achieve these goals, moreover.

In sum, the present research has enhanced our understanding of the entrepreneurial attitudes and intentions of college students by developing and testing an entrepreneurial intention model in a non-Western context, namely Iran. In doing this, the role of culture was examined in addition to the roles of various demographics background and personality characteristics, which has not been done within the context of the model which we used before. The present research has also contributed to the literature on entrepreneurship education by applying the TPB to assess the effects of entrepreneurship education programmes on students' entrepreneurial attitudes and intentions. In doing this, we also examined the capacity of idea generation training and divergent thinking to foster students' ability to generate innovative business opportunities. Numerous implications for future research, theory, education and policy came out of this research endeavour.

To conclude: We hope that this research has provided fertile ground for the further exploration of entrepreneurial intention, behaviour and education. We also hope that this research will inspire policy makers and educators, alike, to stimulate and promote entrepreneurship among students in higher education and Iranian students in particular to ultimately increase levels of entrepreneurship in Iran and elsewhere.



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# Summary

## Introduction

Given the positive influences of entrepreneurship in terms of increasing economic growth and creating jobs, considerable efforts have been made to promote entrepreneurship in both developed and developing countries. Scholars and policymakers are also increasingly interested in the factors which influence the decision to become an entrepreneur and thus understanding why some people decide to start a business while others do not. The research reported in this dissertation therefore explored the factors which influence the *entrepreneurial intentions* of students in higher education in the developing country of Iran. To do this, an established theoretical framework — namely, the Theory of Planned Behaviour (TPB, Ajzen, 1991) — was drawn upon to identify those factors which can be expected to shape the individual's intention to start a business. As Fishbein and Ajzen (2010) have argued, the TPB can help us not only gain an understanding of the determinants of entrepreneurial intentions and behaviour but also design an intervention guided by this understanding and evaluate the effectiveness of the intervention using the conceptual and methodological framework provided by the TPB. We also, thus, used the TPB in the present research to evaluate entrepreneurship education programmes. An existing entrepreneurship course was also redesigned to foster the capacity of students to identify new business opportunities.

## Empirical Studies

In Chapter 1, the General Introduction, the theoretical framework and core concepts of this thesis are defined. Next, the research questions and relevant empirical studies are introduced along with the necessary background information and overview of the research conducted.

Five empirical studies are reported in this dissertation. The first three explored the influences of personal and socio-cultural factors on students' entrepreneurial attitudes and intentions. The fourth study evaluated the effects of entrepreneurship education on students' entrepreneurial attitudes and intentions. The fifth study explored methods to enhance the capacity of students to identify new business opportunities.

In study 1, reported in Chapter 2, we examined the application of the TPB within an Iranian context but also the effects of two important cultural values, namely individualism and collectivism, at the level of the individual while doing this. A questionnaire was distributed to 255 final year undergraduate students from seven public universities in Iran. Structural Equation Modelling showed collectivism to positively influence the entrepreneurial intentions of the students through their subjective norms, on the one hand, and individualism to positively influence the entrepreneurial intentions of the students through their attitudes toward entrepreneurship and perceived behavioural control, on the other hand. We also found



individualism to *moderate* the relationship between attitudes toward entrepreneurship and entrepreneurial intentions, such that the positive relationship was stronger when individualism was high as opposed to low. The TPB was thus shown to work somewhat differently within an Iranian collectivist context and to depend on the cultural value orientations of the students to a significant extent. The results of this study provide a more thorough understanding of the role of cultural values and motivational perceptions in entrepreneurial intentions and can thus help both policymakers and educators develop effective strategies for promoting entrepreneurship.

In study 2, described in Chapter 3, we again drew upon the TPB to explore the influences of gender and entrepreneurial role models on students' entrepreneurial intentions. Data was collected from a sample of 331 students at seven public universities in Iran. Structural equation modelling with a bootstrap procedure was used to analyse the data. Consistent with the TPB, the results showed entrepreneurial role models to indirectly influence entrepreneurial intentions via the antecedents of intention. No gender differences in the relationship between perceived behaviour control and entrepreneurial intentions was found, but gender was a significant moderator of the other relationships within the TPB. Attitudes toward entrepreneurship were a weaker predictor and subjective norms a stronger predictor of the entrepreneurial intentions of female students compared to male students. Furthermore, perceived behaviour control and attitudes toward entrepreneurship were more strongly influenced by role models for female as opposed to male students. This study thus contributes to the entrepreneurship literature by extending the TPB to include entrepreneurial role models and gender but also identifying the relevant mediating and moderating effects within the model.

In study 3, reported in Chapter 4, we incorporated personality characteristics and perceived contextual support into the TPB and further investigated the mediating roles of attitudes toward entrepreneurship and perceived behavioural control for entrepreneurial intentions. Data were collected from a sample of 331 students at seven public universities in Iran. Mediation analysis using structural equation modelling with bootstrapping indicated that attitudes toward entrepreneurship and perceived behavioural control fully mediated the influences of personality characteristics on entrepreneurial intentions. Among the contextual factors, perceived government support showed a significant *indirect* effect upon entrepreneurial intentions via perceived behavioural control. Contrary to expectations, perceived university support showed a significant *direct* effect upon entrepreneurial intentions w — an effect which was thus not mediated by attitudes toward entrepreneurship or perceived behavioural control.

In study 4, reported in Chapter 5, we examined the effectiveness of entrepreneurship education on the entrepreneurial intentions of students. Building on the TPB, an ex-ante and ex-post survey was used to assess the impacts of elective and compulsory entrepreneurship

education courses on students' entrepreneurial intention. A questionnaire was administered to a sample of 205 students taking either an elective or a compulsory entrepreneurship course from six Iranian public universities. The results of structural equation modelling, paired and independent samples t-tests showed both the elective and compulsory courses to positively impact the students' subjective norms and perceived behavioural control. Elective participation in an entrepreneurial education course also significantly increased the entrepreneurial intentions of the students while compulsory participation did not. Neither elective nor compulsory participation in an entrepreneurship education course influenced the attitudes of the students toward entrepreneurship, moreover.

Study 5, reported in Chapter 6, examined the ability of students to generate new business ideas and identify promising business opportunities following participation in an entrepreneurship course with creativity exercises which were specially designed to stimulate these capacities. Pre-versus post-test comparisons showed the students to have a higher level of divergent thinking and to perceive themselves as more creative following participation in the course but also relative to students who did not participate in the course. The students generated not only a greater number of business ideas but also more innovative business ideas following participation in the course designed to develop this competence.

In the General Discussion presented in the final chapter of this dissertation, Chapter 7, the main findings are summarized along with the main conclusions. The general theoretical implications are presented, and the extension of the TPB is discussed. The strengths and limitations of the conducted studies are then point out and translated into numerous suggestions for promising further research. Specific attention is paid to methodological issues including the need for longitudinal research to trace the influence of exogenous variables and any changes in the components of the TPB and entrepreneurial intentions over time. Finally, a number of practical implications of the conducted studies are suggested with a focus on what is needed in the field of entrepreneurship education.

## **Theoretical and Practical Implications**

The findings of this research have a number of theoretical and practical implications, and they thus contribute to the literature on entrepreneurial intentions and entrepreneurship education — particularly for higher education in Iran.

First, the findings add to the emerging literature on the prediction of entrepreneurial intentions using the Theory of Planned Behaviour. The Theory of Planned Behaviour is shown to be appropriate for research on the entrepreneurial intentions of students in a developing country like Iran. Second, the findings shed light on the importance of exogenous variables such as

demographic background factors and personality characteristics for the formation of entrepreneurial intentions. Third, the findings show that the TPB provides a useful framework to assess the effectiveness of entrepreneurship education programmes. Fourth, the findings not only illuminated the effects of entrepreneurship education programmes on students' entrepreneurial attitudes and intentions but also showed the effectiveness of idea generation training for fostering the ability of students to generate innovative business ideas.

As for the practical implications of the findings, both educators and policymakers can use the insights provided here to develop effective strategies for promoting entrepreneurship. Perceived behavioural control was found to be the strongest predictor of entrepreneurial intentions, for example. This means that policymakers and entrepreneurship educators should attend to how to increase this motivational factor in order to increase the entrepreneurial intentions of students. The findings reported in Chapter 3 show the presence of entrepreneurial role models to be an important factor for increasing perceived behavioural control. Entrepreneurship education programmes and workshops might therefore consider including contact — or greater contact — with entrepreneurial role models as part of their curricula. In a similar vein, the findings reported in Chapter 6 show the model of idea generation to provide a suitable framework for fostering the ability to identify business opportunities. Educators should thus be able to draw upon this or a similar model to guide the incorporation of creativity training into entrepreneurship education programmes and thereby increase the ability of students and future entrepreneurs to identify promising business opportunities.

### **Limitations and Directions for Future Study**

The current study has several limitations which nevertheless point to fruitful directions for further research. First, the studies reported in Chapters 2- 4 were cross-sectional, which prevented us from gaining insight into the influence of exogenous factors on entrepreneurial attitudes and intentions over time. Longitudinal study is therefore recommended in the future to trace the influence of these and other factors on the entrepreneurial attitudes and intentions of students. Longitudinal study is also needed to document the relations between entrepreneurial intentions and subsequent entrepreneurial behaviour. A second set of limitations concerns the use of self-report data in all of the studies except that reported in Chapter 6. Self-report data is known to be susceptible to bias and, in future research, entrepreneurial intentions should therefore be examined using other methods (e.g., observation and interview). The information provided by these different perspectives can then be triangulated to gain greater insight into the entrepreneurial intentions of students and the effects of entrepreneurial education efforts. Third, is the question of the generalizability of the present results collected in a developing non-Western

culture to other cultures and developing non-Western cultures in particular. Care must be taken in generalizing the present results beyond the Iranian context. A final limitation is that the results reported in Chapters 5 and 6 concern the overall effects of participating in an entrepreneurship course as a complete package. Attention to the specific design elements, substance of the courses, exact nature of the exercises and instructional approaches is obviously needed in the future to maximize training efficiency and facilitate the development of highly effective curricula.

## **Conclusions**

Taken together, the findings of this research can be seen to have enhanced our understanding of entrepreneurial attitudes and intentions of college students in a number of ways. First, by developing and applying a model of entrepreneurial intention in a non-Western context, namely Iran. Second, by extending the model to empirically examine the roles of culture, demographic background and personality characteristics. The findings of the present research have also contributed to the literature on entrepreneurship education in a number of ways. First, by applying the Theory of Planned Behaviour to assess the effects entrepreneurship education programmes on the entrepreneurial attitudes and intentions of students. Second, by developing idea generation training on the basis of the creativity model of business idea development and testing the ability of this training to enhance the capacity of students to generate innovative business ideas. Third, by identifying a multitude of useful directions for future research and practical implications for policymakers, educators and entrepreneurial course planners.

It is our hope that this research has provided not only fruitful ground for the further exploration of the entrepreneurial intentions and behaviour of students in conjunction with the effects of entrepreneurship education but also inspiration for policymakers and educators to successfully stimulate entrepreneurship among Iranian students and thereby increase the levels of entrepreneurship in this country.

Nederlandse samenvatting  
(Dutch summary)

## Introductie

Gezien de positieve invloed van ondernemerschap op economische groei en de creatie van banen, zijn zowel in ontwikkelde landen als in minder ontwikkelde landen aanzienlijke inspanningen verricht om ondernemerschap te stimuleren. Onderzoekers en beleidsmakers zijn in toenemende mate geïnteresseerd in de factoren die van invloed zijn op de beslissing om ondernemer te worden. Hieruit blijkt dat zij willen begrijpen waarom sommige mensen besluiten een onderneming te starten en anderen niet. Het onderzoek uit dit proefschrift biedt daarom inzicht in de factoren die van invloed zijn op de *ondernemerschapintenties* van studenten in het hoger onderwijs, in het zich ontwikkelende land Iran. Om dit te onderzoeken, is een erkend theoretisch raamwerk – namelijk *the Theory of Planned Behaviour* (TPB, Ajzen, 1991) – gebruikt om de gezamenlijke factoren te identificeren die naar verwachting de intentie van een individu vormen om een onderneming te starten. Zoals Fishbein and Ajzen (2010) beargumenteren, kan de TPB niet alleen helpen om inzicht te verkrijgen in de verklarende factoren van ondernemerschapintenties en –gedrag, maar ook om aan de hand van de verklarende factoren een interventie te ontwerpen en om de effectiviteit van deze interventie te evalueren. Om deze reden is de TPB in het huidige onderzoek tevens gebruikt om onderwijsprogramma's omtrent ondernemerschap te evalueren. Daarnaast is een bestaande ondernemerschapscursus herontwikkeld teneinde het vermogen van studenten te stimuleren om nieuwe, zakelijke kansen te identificeren.

## Empirische studies

In hoofdstuk 1 worden de algemene introductie, het theoretisch raamwerk en de kernconcepten van deze thesis gedefinieerd. Daarnaast worden de onderzoeksvragen en relevante empirische studies geïntroduceerd, samen met de nodige achtergrondinformatie en een overzicht van het uitgevoerde onderzoek.

In dit proefschrift worden vijf empirische studies gerapporteerd. Middels de eerste drie studies is de invloed van persoonlijke en sociaal culturele factoren op de attitude ten opzichte van ondernemerschap en ondernemerschapintentie van studenten onderzocht. In de vierde studie is het effect van ondernemerschapsonderwijs op de attitude ten opzichte van ondernemerschap en ondernemerschapintentie van studenten geëvalueerd. In de vijfde studie is een methode onderzocht om het vermogen van studenten om nieuwe, zakelijke kansen te identificeren te verbeteren.

In studie 1, zoals gerapporteerd in hoofdstuk 2, onderzochten we de toepassing van de TPB in een Iraanse context, evenals het effect van twee belangrijke culturele waarden op individueel niveau, namelijk individualisme en collectivisme. Een vragenlijst is verspreid onder 255

laatstejaars bachelor studenten van zeven publieke universiteiten in Iran. *Structural equation modelling* liet enerzijds zien dat collectivisme de ondernemerschapintenties van de studenten positief beïnvloedde via hun subjectieve normen. Anderzijds beïnvloedde individualisme de ondernemerschapintenties van de studenten positief via hun attitude ten opzichte van ondernemerschap en gepercipieerde controle over gedrag. Ook werd gevonden dat individualisme de relatie tussen attitudes ten opzichte van ondernemerschap en ondernemerschapintenties modereert: de positieve relatie was sterker wanneer individualisme hoog scoorde. De TPB werkt anders in een Iraanse, collectivistische context en is in significante mate afhankelijk van de culturele waarde oriëntatie van de studenten. De resultaten verkregen in dit onderzoek bieden grondig inzicht in de rol van culturele waarden en waargenomen motivatie voor ondernemerschapintenties. Om deze reden kunnen de resultaten beleidsmakers en docenten helpen om effectieve strategieën voor het promoten van ondernemerschap te ontwikkelen.

In studie 2, zoals gerapporteerd in hoofdstuk 3, hebben we opnieuw gebruik gemaakt van de TPB om de invloed van sekse en rolmodellen binnen het ondernemerschap op de ondernemerschapintenties van studenten te onderzoeken. Data zijn verzameld door middel van een steekproef van 331 studenten van zeven publieke universiteiten in Iran. Om de data te analyseren is *structural equation modelling* toegepast met een *bootstrap* procedure. Overeenkomstig met de TPB wijzen de resultaten op een indirecte invloed van rolmodellen op ondernemerschapintenties, via de antecedenten van intentie. Er zijn geen sekseverschillen gevonden wat betreft de relatie tussen gepercipieerde controle over gedrag en ondernemerschapintenties. Wel was sekse een significante moderator voor de andere relaties binnen de TPB. Attitude ten opzichte van ondernemerschap bleek een zwakkere en subjectieve normen een sterkere voorspeller van de ondernemerschapintenties van vrouwelijke studenten, ten opzichte van mannelijke studenten. Daarnaast werden gepercipieerde controle over gedrag en attitude ten opzichte van ondernemerschap sterker beïnvloed door rolmodellen voor vrouwelijke dan voor mannelijke studenten. Deze studie draagt bij aan de ondernemerschapliteratuur door de TPB uit te breiden middels het betrekken van rolmodellen en sekse en door de identificatie van mediërende en modererende effecten binnen het model.

In studie 3, zoals gerapporteerd in hoofdstuk 4, hebben we persoonlijke eigenschappen en gepercipieerde ondersteuning uit de omgeving in de TPB opgenomen. Daarnaast hebben we de mediërende rol van attitude ten opzichte van ondernemerschap en gepercipieerde controle over gedrag op ondernemerschapintenties verder onderzocht. Data zijn verzameld door middel van een steekproef van 331 studenten van zeven publieke universiteiten in Iran. *Mediation* analyse, toegepast middels *structural equation modelling* met een *bootstrap* procedure, indiceert

dat attitude ten opzichte van ondernemerschap en gepercipieerde controle over gedrag de invloed van persoonlijke eigenschappen op ondernemerschapintenties volledig mediëren. Van de contextuele factoren liet gepercipieerde ondersteuning van de overheid een significant *indirect* effect zien op ondernemerschapintenties, via gepercipieerde controle over gedrag. Tegen onze verwachtingen in had ontvangen ondersteuning vanuit de universiteit een significant *direct* effect op ondernemerschapintenties – een effect dat dus niet werd gemedieerd door de attitude ten opzichte van ondernemerschap of de gepercipieerde controle over gedrag.

In studie 4, zoals gerapporteerd in hoofdstuk 5, hebben we het effect van ondernemerschaponderwijs op de ondernemerschapintenties van studenten onderzocht. Voortbouwend op de TPB is middels een voor- en natest de impact van verplichte en optionele ondernemerschapcursussen op de ondernemerschapintenties van studenten gemeten. Een vragenlijst is verspreid onder een steekproef van 205 studenten die deelnamen aan een optionele of verplichte ondernemerschapcursus aan zes verschillende Iraanse publieke universiteiten. De resultaten van *structural equation modelling* en een afhankelijke en onafhankelijke t-toets lieten zien dat zowel de optionele als verplichte ondernemerschapcursussen een positieve impact hebben op de subjectieve normen van studenten en de gepercipieerde controle over gedrag. Vrijwillige participatie aan een ondernemerschapcursus leidde tevens tot een significante toename van de ondernemerschapintenties van studenten. Bij verplichte participatie aan een ondernemerschapcursus is dit effect niet gevonden. Bovendien beïnvloedde participatie aan zowel de optionele als de verplichte ondernemerschapcursussen de attitude van studenten ten opzichte van ondernemerschap niet.

In studie 5, zoals gerapporteerd in hoofdstuk 6, is het vermogen van studenten om nieuwe zakelijke ideeën te genereren en om veelbelovende zakelijke kansen te identificeren onderzocht. De participerende studenten volgden een ondernemerschapcursus waarin zij creativiteitsoefeningen deden die speciaal ontworpen zijn om het vermogen om ideeën te genereren en kansen te identificeren te stimuleren. Vergelijkingen tussen voor- en natesten lieten zien dat studenten over een hoger niveau van *divergent thinking* beschikten. Daarnaast ervaren studenten dat ze door het volgen van de cursus creatiever werden en ze vonden zichzelf relatief creatiever dan de studenten die de cursus niet volgden. De studenten die de cursus volgden genereerden niet alleen meer ideeën, maar deze ideeën waren ook innovatiever.

In de algemene discussie, zoals gepresenteerd in het laatste hoofdstuk van het proefschrift, worden de belangrijkste bevindingen samengevat aan de hand van de belangrijkste conclusies. De algemene, theoretische implicaties worden gepresenteerd, en de aanvulling op de TPB wordt bediscussieerd. Vervolgens worden de sterke kanten en beperkingen van de uitgevoerde studies besproken en vertaald naar verschillende suggesties voor veelbelovend,



toekomstig onderzoek. Specifieke aandacht wordt besteed aan methodologische kwesties, zoals de behoefte aan longitudinaal onderzoek om de invloed van externe variabelen en veranderingen in de componenten van TPB en ondernemerschapintenties over een langere periode te onderzoeken. Tot slot worden een aantal praktische implicaties van de uitgevoerde studies benoemd, waarbij voornamelijk ingegaan wordt op behoeftes op het gebied van ondernemerschaponderwijs.

## **Theoretische en praktische implicaties**

De bevindingen uit dit onderzoek hebben een aantal theoretische en praktische implicaties, en dragen bij aan de literatuur over ondernemerschapintenties en onderwijs – in het bijzonder binnen het hoger onderwijs in Iran.

Ten eerste dragen de bevindingen bij aan de toenemende literatuur met betrekking tot het voorspellen van ondernemerschapintenties, benaderd vanuit de TPB. De TPB is geschikt gebleken voor onderzoek naar ondernemerschapintenties van studenten in een land dat in ontwikkeling is, zoals Iran. Ten tweede onderstrepen de bevindingen het belang van externe variabelen, zoals demografische factoren en persoonlijke eigenschappen, voor de totstandkoming van ondernemerschapintenties. Ten derde biedt de TPB volgens de bevindingen een bruikbaar raamwerk om de effectiviteit van onderwijsprogramma's over ondernemerschap te evalueren. Ten vierde belichten de bevindingen niet alleen het effect van ondernemerschaponderwijs op de ondernemerschapintenties en attitude van studenten, maar ook het effect van training omtrent het genereren van ideeën op het vermogen van studenten om innovatieve, zakelijke ideeën te genereren.

Wat betreft de praktische implicaties van de bevindingen, kunnen zowel docenten als beleidsmakers de inzichten uit het onderzoek gebruiken om effectieve strategieën te ontwikkelen voor de bevordering van ondernemerschap. Zo was gepercipieerde controle over gedrag bijvoorbeeld de sterkste voorspeller van ondernemerschapintenties. Dit betekent dat docenten en beleidsmakers zouden moeten letten op hoe zij deze motiverende factor kunnen verhogen, zodat de ondernemerschapintenties van studenten kunnen toenemen. De bevindingen uit hoofdstuk 3 laten zien dat de aanwezigheid van rolmodellen uit de ondernemerschap een belangrijke factor is voor het verhogen van de gepercipieerde controle over gedrag. Ontwerpers van onderwijsprogramma's over ondernemerschap zouden daarom kunnen overwegen om (meer) contact met rolmodellen op te nemen in het curriculum. Op eenzelfde manier laten de bevindingen uit hoofdstuk 6 zien dat het model voor het genereren van ideeën een geschikt raamwerk biedt voor het stimuleren van het vermogen van studenten om ondernemerschapkansen te identificeren. Docenten zouden daarom in staat moeten zijn om op

basis van dit model of een vergelijkbaar model creativiteitstraining in onderwijsprogramma's over ondernemerschap een plek te geven, zodat het vermogen van studenten en toekomstige ondernemers om veelbelovende, zakelijke kansen te identificeren wordt verhoogd.

### **Beperkingen en richtingen voor toekomstig onderzoek**

De huidige studie kent verschillende beperkingen, welke niettemin wijzen op interessante richtingen voor verder onderzoek. Ten eerste zijn de studies, zoals gerapporteerd in hoofdstukken 2 t/m 4, cross-sectioneel van aard, waardoor het niet mogelijk is om inzicht te bieden in de invloed van externe factoren op attitude ten opzichte van ondernemerschap en ondernemerschapintenties over een langere periode. Om deze reden wordt aangeraden om in de toekomst longitudinaal onderzoek uit te voeren om de invloed van deze en andere factoren op de attitude ten opzichte van ondernemerschap en ondernemerschapintenties te volgen. Ook is longitudinaal onderzoek nodig om de relatie tussen ondernemerschapintenties en later ondernemend gedrag te documenteren. Een tweede beperking betreft het gebruik van zelfrapportages in alle studies, behalve in studie 6. Het is bekend dat data verkregen uit zelfrapportages vatbaar zijn voor vertekeningen en daarom zouden ondernemerschapintenties in de toekomst op een andere manier gemeten moeten worden (bijvoorbeeld middels observaties of interviews). De informatie verkregen uit de verschillende perspectieven kan vervolgens middels triangulatie gebruikt worden om dieper inzicht te verkrijgen in de ondernemerschapintenties van studenten en het effect van de inspanningen van ondernemerschaponderwijs. Ten derde is het de vraag of het mogelijk is om de huidige resultaten, welke verzameld zijn in een land dat in ontwikkeling is, te generaliseren naar andere culturen in het algemeen en naar andere, in ontwikkeling zijnde, niet-westerse culturen in het bijzonder. Men dient voorzichtig te zijn met het generaliseren van de resultaten buiten de Iraanse context. Een laatste beperking is dat de resultaten gerapporteerd in hoofdstuk 5 en 6 overkoepelende effecten betreffen van de ondernemerschapscursus in zijn geheel. In de toekomst is aandacht voor specifieke ontwerpelementen, zoals de materie van de cursus en de exacte aard van de oefeningen en de instructiebenaderingen, nodig om de effectiviteit van de training te maximaliseren en om de ontwikkeling van effectieve curricula te faciliteren.

### **Conclusie**

De gezamenlijke bevindingen uit dit onderzoek verhogen op een aantal manieren ons begrip van de attitude ten opzichte van ondernemerschap en ondernemerschapintenties van studenten. Ten eerste door de ontwikkeling en toepassing van een model voor ondernemerschapintenties in een niet-westerse context, namelijk Iran. Ten tweede door het model aan te vullen vanuit empirisch

onderzoek naar de rol van cultuur, demografische achtergrond en persoonlijke eigenschappen. Ook dragen de bevindingen uit dit onderzoek op een aantal manieren bij aan de literatuur over ondernemerschaponderwijs. Ten eerste door de toepassing van TPB om het effect van onderwijsprogramma's over ondernemerschap op de attitude ten opzichte van ondernemerschap en ondernemerschapintenties te evalueren. Ten tweede door de ontwikkeling van een training, gebaseerd op het creativiteitsmodel voor de ontwikkeling van zakelijke kansen, omtrent het genereren van ideeën en het testen van de bekwaamheid van deze training om het vermogen van studenten om innovatieve, zakelijke ideeën te genereren, te versterken. Ten derde door de identificatie van een verscheidenheid aan relevante richtingen voor toekomstig onderzoek en praktische implicaties voor beleidsmakers, docenten en ontwikkelaars van ondernemerschapcursussen.

Wij hopen dat dit onderzoek niet alleen een start biedt voor verder onderzoek naar ondernemerschapintenties en –gedrag van studenten in combinatie met de effecten van ondernemerschaponderwijs, maar ook inspiratie biedt voor beleidsmakers en docenten om ondernemerschap succesvol te stimuleren onder Iraanse studenten en om daarmee het ondernemerschap in dit land te verbeteren.



## Persian Summary (خلاصه فارسی)

استفاده از این مدل یک مدل مشابه جهت ادغام آموزش خلاقیت در برنامه های آموزش کارآفرینی بهره بگیرند و بدینوسیله توانایی دانشجویان و کارآفرینان آینده را در زمینه تشخیص فرصت های شغلی بهبود دهند .

### محدودیت‌های تحقیق و پیشنهادهایی برای مطالعات آتی

تحقیق حاضر یکسری محدودیت‌هایی دارد که می توانند به عنوان مسیری برای مطالعات آینده مورد نظر قرار گیرند. نخست، مطالعات گزارش شده در فصل های دو، سه و چهار، مقطعی<sup>۱</sup> بودند، بنابراین نمی توان تاثیر متغیرهای بیرونی بر نگرش و قصد کارآفرینانه را در طول زمان فهمید. بنابراین لازم است که در تحقیقات آینده، به منظور پیگیری و درک اثرات این متغیرها بر نگرش و قصد کارآفرینانه دانشجویان، مطالعه بلند مدت<sup>۲</sup> صورت پذیرد. همچنین به منظور بررسی و درک رابطه بین قصد و رفتار کارآفرینی ما نیازمند انجام مطالعه بلند مدت می باشیم. دومین گروه از محدودیتها مربوط به استفاده از داده های خود-گزارش<sup>۳</sup> شده می باشند. این داده ها می توانند اریب باشند، بنابراین در تحقیقات آینده بهتر است که از داده های مورد نیاز با استفاده از روشهای دیگر هم (مثل مشاهده و مصاحبه) استفاده شود. اطلاعات جمع آوری شده از طرق مختلف و دیدگاه های متفاوت می توانند دانش و فهم بهتری نسبت به قصد کارآفرینانه دانشجویان و اثرات آموزش کارآفرینی فراهم نمایند. سومین محدودیت مرتبط با تعمیم پذیری یافته های پژوهش حاضر می باشد. در رابطه با تعمیم یافته های این پژوهش به کشورهای در حال توسعه دیگر، باید احتیاط لازم را رعایت نمود. محدودیت آخری هم مرتبط با نتایج گزارش شده در فصول پنجم و ششم در رابطه با اثرات کلی مشارکت در یک درس کارآفرینی به عنوان یک بسته کامل می باشد. ضروریست که در تحقیقات آینده عناصر طراحی درس، ماهیت دقیق تمرینها و رهیافتهای آموزشی به طور مشخصی مورد بررسی قرار گیرند تا بدین طریق بتوان کارآیی آموزش را افزایش داد و به تدوین برنامه های آموزشی کارآمد کمک نمود.

### نتیجه گیری

به طور کلی یافته های این تحقیق می توانند درک ما را از نگرش و قصد کارآفرینانه دانشجویان به طرق مختلف بهبود بخشد. نخست، از طریق توسعه و کاربرد یک مدل قصد کارآفرینانه در یک محیط غیر غربی، یعنی ایران. دوم از طریق گسترش مدل مذکور با بررسی تجربی نقش فرهنگ، ویژگیهای دموگرافیک و شخصیتی. یافته ها همچنین به طرق مختلفی به ادبیات آموزش کار آفرینی کمک کرد: نخست، از طریق کاربرد تئوری رفتار برنامه ریزی شده جهت ارزیابی اثرات آموزش کارآفرینی بر نگرش و قصد کارآفرینانه دانشجویان. دوم، از طریق تدوین آموزش تولید ایده بر اساس مدل خلاقیت توسعه ایده شغلی و بررسی توانایی این نوع آموزش بر بهبود ظرفیت دانشجویان در زمینه تولید ایده های نوین کسب و کار. سوم، از طریق تشخیص یکسری از پیشنهادها مفید برای تحقیقات آینده و کاربردهای عملی برای سیاستگذاران، آموزشگران و طراحان دروس کارآفرینی.

امیدواریم که پژوهش حاضر زمینه مناسبی را برای تحقیقات آینده درباره قصد و رفتار کارآفرینی دانشجویان و اثرات آموزش کارآفرینی فراهم نموده باشد. همچنین توانسته باشد الهام بخش سیاستگذاران و آموزشگران در رابطه با توسعه کارآفرینی در بین دانشجویان ایران باشد و بدین طریق به افزایش سطح کارآفرینی در کشور کمک کند.

<sup>1</sup> Cross-sectional

<sup>2</sup> Longitudinal study

<sup>3</sup> Self-report data

قصد کارآفرینانه دانشجویان را افزایش داد درحالیکه این افزایش برای دروس اجباری معنادار نبود. هیچکدام از دروس اختیاری و اجباری، نگرش دانشجویان نسبت به کارآفرینی و توانایی آنان در شناسایی فرصتهای شغلی را به طور معناداری تغییر ندادند.

مطالعه پنجم (فصل ششم) توانایی دانشجویان در تولید ایده های کسب و کار و شناسایی فرصتهای شغلی در یک درس کارآفرینی که با تمرینات خلاقیت ادغام شده بود، مورد بررسی و ارزیابی قرار داد. مقایسه پیش آزمون و پس آزمون نشان داد که دانشجویانی که این درس شرکت نموده اند نسبت به دانشجویانی که شرکت نکرده اند سطح بالاتری از تفکر واگرا<sup>4</sup> دارند و خود را خلاقتر تصور می نمایند. همچنین این دانشجویان توانستند تعداد بیشتر از ایده های نوین کسب و کار<sup>5</sup> را تولید نمایند.

در فصل هفتم این رساله، یافته های عمده مطالعات تجربی همراه با نتیجه گیری کلی به طور خلاصه آورده شده اند. کاربردهای تئوری همراه با مبحث توسعه تئوری رفتار برنامه ریزی شده بحث می شوند. نقاط قوت و محدودیتهای تحقیق همراه با پیشنهادهایی برای تحقیقات آتی مطرح می گردد. توجه اصلی این بخش بر مباحث روش شناختی از جمله نیاز به مطالعه بلند مدت جهت پیگیری و بررسی اثرات متغیرهای بیرونی و تغییرات ایجاد شده در متغیرهای تئوری رفتار برنامه ریزی شده در طول زمان متمرکز می باشد. در نهایت، با توجه به مطالعات انجام شده یکسری کاربردهای عملی با تمرکز بر نیازهای موجود در زمینه آموزش کارآفرینی پیشنهاد می شوند.

### کاربردهای نظری و عملی

یافته های این تحقیق یکسری کاربردهای نظری و عملی دارد و بنابراین به ادبیات پژوهشی قصد کارآفرینانه و آموزش کارآفرینی - بویژه آموزش عالی ایران - کمک می نمایند.

نخست، یافته ها به ادبیات پژوهشی در زمینه قصد کارآفرینانه با کاربرد تئوری رفتار برنامه ریزی شده کمک می نماید. پژوهش حاضر نشان داد که تئوری رفتار برنامه ریزی شده تئوری مناسبی جهت مطالعه قصد کارآفرینانه دانشجویان در کشورهای در حال توسعه همانند ایران می باشد. دوم، یافته های این پژوهش اهمیت متغیرهای بیرونی - نظیر عوامل دموگرافیک و ویژگیهای شخصیتی - را برای تشکیل و توسعه قصد کارآفرینانه مشخص می کند. سوم، یافته ها نشان دادند که تئوری رفتار برنامه ریزی شده چارچوب مناسبی برای ارزیابی اثربخشی برنامه های آموزش کارآفرینی فراهم می نماید. چهارم، یافته ها نه تنها اثرات برنامه های آموزش کارآفرینی بر نگرش و قصد کارآفرینانه را نشان داد بلکه همچنین نشان داد که آموزش تولید ایده ها بر توانایی دانشجویان در زمینه تولید ایده های نوین کسب و کار موثر می باشند.

از بعد کاربردهای عملی، هم آموزشگران و هم سیاستگذاران می توانند از دانش و آگاهی حاصل شده در این پژوهش جهت تدوین راهبردهای اثربخش به منظور توسعه کارآفرینی بهره بگیرند. برای مثال، نتایج نشان داد که کنترل رفتار درک شده قویترین پیش بینی کننده قصد کارآفرینانه دانشجویان می باشد. این بدان معناست که سیاستگذاران و آموزشگران باید توجه ویژه ای به بهبود این متغیر داشته باشند. یافته های گزارش شده در فصل سوم نشان داد که حضور مدل نقش کارآفرینی عامل مهمی برای بهبود کنترل رفتار درک شده می باشد. بنابراین، برنامه ها و کارگاه های آموزش کار آفرینی بهتر است که از مدل نقش کار آفرینی و کارآفرینان به طور موثری بهره بگیرند. بعلاوه یافته های گزارش شده در فصل ششم نشان داد که مدل تولید ایده چارچوب مناسبی برای بهبود توانایی دانشجویان در زمینه شناسایی فرصت های شغلی فراهم می نماید. بنابراین آموزشگران باید قادر باشند که با

<sup>4</sup> Divergent thinking

<sup>5</sup> Innovative business ideas

بنابراین، نتایج این مطالعه به طور کلی بیانگر آن بود که تئوری برنامه ریزی شده در محیط ایران قابلیت کاربرد دارد اما تا حدودی متفاوت عمل می کند و روابط درون این تئوری بستگی به ارزشهای فرهنگی دانشجویان دارد. نتایج این مطالعه به درک نقش ارزشهای فرهنگی و تصورات انگیزشی در تشکیل و توسعه قصد کارآفرینانه کمک می نماید و بنابراین می تواند هم سیاستگذاران و هم آموزشگران را در زمینه تدوین و ارائه راهبردهای موثر برای توسعه و ترویج کارآفرینی یاری رساند.

در مطالعه دوم که در فصل سوم این رساله گزارش شده است، براساس تئوری رفتار برنامه ریزی شده، نقش جنسیت و مدل نقش کارآفرینی<sup>۶</sup> بر قصد کارآفرینانه دانشجویان مورد بررسی قرار گرفت. داده های مورد نیاز از یک نمونه متشکل از ۳۳۱ دانشجو در هفت دانشگاه ایران جمع آوری گردید. داده های حاصله با کمک مدل معادله ساختاری همراه با روش بوت استرپینگ<sup>۷</sup> مورد تحلیل قرار گرفتند. مطابق با تئوری، نتایج نشان داد که مدل نقش کارآفرینی به طور غیرمستقیم از طریق نگرش، هنجارهای عینی و کنترل رفتاری درک شده<sup>۸</sup>، قصد کارآفرینانه دانشجویان را تحت تاثیر قرار می دهد. تفاوت جنسیتی در رابطه بین کنترل رفتاری درک شده و قصد کارآفرینانه پیدا نشد اما جنسیت رابطه بین دو متغیر دیگر و قصد کارآفرینانه را بطور معناداری تحت تاثیر قرار داد به گونه ای که رابطه نگرش و قصد برای دانشجویان دختر در مقایسه با دانشجویان پسر ضعیفتر بود در حالیکه رابطه بین هنجارهای عینی و قصد کارآفرینانه برای دختران قوی تر بود. همچنین تاثیر مدل نقش کارآفرینی بر نگرش و کنترل رفتاری درک شده در دختران نسبت به پسران قویتر بود. این مطالعه به ادبیات کارآفرینی و تئوری رفتار برنامه ریزی شده از طریق ادغام مدل نقش کارآفرینی و جنسیت در این تئوری و بررسی اثرات تعدیلی و غیر مستقیم کمک می نماید.

در مطالعه سوم (فصل چهارم)، ما ویژگیهای شخصیتی<sup>۹</sup> و عوامل محیطی<sup>۱۰</sup> را در تئوری رفتار برنامه ریزی شده ادغام نموده و نقش واسطه گری<sup>۱۱</sup> نگرش و کنترل رفتاری درک شده را مورد بررسی قرار دادیم. داده ها از یک نمونه ۳۳۱ نفری در هفت دانشگاه دولتی جمع آوری گردید. تحلیل واسطه با استفاده از مدل معادله ساختاری همراه با بوست رپینگ نشان داد که ویژگیهای شخصیتی از طریق نگرش و کنترل رفتاری درک شده به طور غیر مستقیم قصد کارآفرینانه را تحت تاثیر قرار می دهند. در بین فاکتورهای محیطی، حمایت دولتی اثر غیرمستقیم معناداری بر قصد کارآفرینانه دانشجویان از طریق کنترل رفتاری درک شده داشت. بر خلاف انتظار، حمایت دانشگاه اثر مستقیم - و نه غیر مستقیم - بر قصد کارآفرینانه دانشجویان داشت.

در مطالعه چهارم (فصل پنجم)، ما به ارزیابی تاثیر آموزش کارآفرینی بر قصد کارآفرینانه دانشجویان پرداختیم. با استفاده از تئوری رفتار برنامه ریزی شده، یک پیمایش پیش آزمون-پس آزمون<sup>۱۲</sup> به منظور ارزیابی تاثیر دروس اجباری و انتخابی کارآفرینی بر قصد کارآفرینانه دانشجویان انجام پذیرفت. پرسشنامه تحقیق در بین ۲۰۵ نفر دانشجوی کارشناسی در شش دانشگاه دولتی توزیع گردید. نتایج مدل معادله ساختاری، آزمون مستقل و وابسته تی نشان داد که هم دروس انتخابی و هم دروس اجباری کارآفرینی تاثیر مثبتی بر هنجارهای عینی و کنترل رفتاری درک شده دانشجویان دارند. شرکت اختیاری در دروس کارآفرینی همچنین به طور مثبتی

<sup>6</sup> Entrepreneurial role model

<sup>7</sup> Bootstrapping

<sup>8</sup> Perceived behavioral control

<sup>9</sup> Personality characteristics

<sup>10</sup> Contextual factors

<sup>11</sup> Mediating role

<sup>12</sup> Pre-test-post-test survey



## مقدمه

به علت اثرات مثبت کارآفرینی نظیر افزایش رشد اقتصادی و اشتغال، تلاش گسترده ای جهت ترویج و ارتقای آن در کشورهای توسعه یافته و در حال توسعه انجام شده است. پژوهشگران و سیاستگذاران هم به طور روزافزونی سعی می کنند که عوامل موثر بر کارآفرینی را شناسایی نمایند و درک کنند که چرا بعضی از افراد تصمیم به راه اندازی یک کسب و کار می گیرند در حالیکه بعضی دیگر چنین تصمیمی را اتخاذ نمی کنند. بنابراین، هدف تحقیق حاضر آن است که عوامل موثر بر قصد کارآفرینانه دانشجویان در دانشگاه های دولتی ایران را مورد مطالعه و بررسی قرار دهد. برای انجام این پژوهش، با کاربرد یک چارچوب تئوری معتبر، یعنی تئوری رفتار برنامه ریزی شده<sup>۱۳</sup> (آجنز، ۱۹۹۱)<sup>۱۴</sup>، سعی شد که عوامل موثر بر تشکیل و توسعه قصد کارآفرینانه دانشجویان شناسایی و مطالعه شود. آنچنانکه فیشبین و آجنز (۲۰۱۰)<sup>۱۵</sup> بیان می کنند، تئوری رفتار برنامه ریزی شده نه تنها می تواند به درک عوامل تعیین کننده قصد و رفتار کارآفرینی کمک کند، بلکه همچنین می تواند به تدوین، ارائه و ارزیابی دوره های آموزشی کار آفرینی یاری رساند. بنابراین از این تئوری جهت ارزیابی برنامه های آموزش کارآفرینی نیز بهره گرفته شد. همچنین به منظور بهبود توانایی دانشجویان در زمینه تشخیص فرصتهای شغلی جدید<sup>۱۶</sup>، یکی از دروس رایج آموزش کارآفرینی در دانشگاه های دولتی مورد طراحی و ارزیابی مجدد قرار گرفت.

## مطالعات تجربی

در فصل اول (مقدمه کلی) ابتدا چارچوب تئوری و مفاهیم اصلی پژوهش تعریف می شوند. سپس سوالات تحقیق و مطالعات تجربی مربوطه همراه با یک نمای کلی از تحقیق ارائه می گردد. در این رساله پنج مطالعه تجربی گزارش می شود. سه مطالعه نخست به بررسی عوامل فردی و اجتماعی-فرهنگی موثر بر قصد و نگرش کارآفرینانه<sup>۱۷</sup> دانشجویان می پردازد. مطالعه چهارم اثرات آموزش کارآفرینی بر نگرش و قصد کارآفرینانه دانشجویان را مورد بررسی قرار می دهد. و سرانجام مطالعه پنجم، به بررسی روشها و نحوه بهبود توانایی دانشجویان در زمینه شناسایی فرصتهای شغلی جدید می پردازد.

در مطالعه اول (فصل دوم)، کاربرد تئوری رفتار برنامه ریزی شده در محیط یک کشور در حال توسعه مثل ایران مورد بررسی قرار گرفت و همچنین تاثیر دو ارزش فرهنگی بسیار مهم، یعنی فردگرایی<sup>۱۸</sup> و جمع گرایی<sup>۱۹</sup>، در سطح فردی مورد مطالعه قرار گرفت. در این مطالعه، پرسشنامه طراحی شده بین ۲۲۵ دانشجوی کارشناسی سال آخر در هفت دانشگاه دولتی توزیع شد. مدل معادله ساختاری<sup>۲۰</sup> نشان داد که جمع گرایی از طریق هنجارهای عینی<sup>۲۱</sup> تاثیر مثبتی بر قصد کارآفرینانه دانشجویان دارد. فردگرایی هم از طریق نگرش نسبت به کارآفرینی، قصد کارآفرینانه آنها را تحت تاثیر قرار می دهد. ما همچنین دریافتیم که فردگرایی می تواند رابطه بین نگرش و قصد کارآفرینانه را به طور مثبتی تعدیل نماید، به عبارت دیگر اگر شخص فردگرا باشند، رابطه بین نگرش و قصد کارآفرینانه او قویتر خواهد بود.

<sup>13</sup> Theory of Planned Behaviour

<sup>14</sup> Ajzen, 1991

<sup>15</sup> Fishbien and Ajzen, 2010

<sup>16</sup> Opportunity identification

<sup>17</sup> Entrepreneurial attitudes and intentions

<sup>18</sup> Individualism

<sup>19</sup> Collectivism

<sup>20</sup> Structural equation modelling

<sup>21</sup> Subjective norms

# تحلیل و ارتقای کارآفرینی در آموزش عالی ایران

نگرش، قصد کارآفرینی و تشخیص فرصت های کسب و کار

سعید کریمی

رساله دکترای آموزش و توسعه کارآفرینی

دانشکده علوم اجتماعی-گروه مطالعات آموزشی

دانشگاه واکینگن

هلند

اسفند ماه ۱۳۹۲

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# About the author

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- Karimi, S.**, Biemans, H.J.A., Mulder, M., Lans T., & Chizari, M. (2013, April). The Influence of Personality Characteristics on Students' Entrepreneurial Intentions within the Theory of Planned Behavior. *Poster/paper presented at the Annual Meeting of the American Educational Research Association*, April 30, San Francisco, the USA.

## Completed Training and Supervision Plan

**Saeid Karimi**  
**Wageningen School of Social Sciences (WASS)**



Wageningen School  
of Social Sciences

In the context of the research school

**ico**

Interuniversity Center for Educational Research

Name of the course	Department/Institute	Year	ECTS (=28 hrs)
<b>I. General part</b>			
Scientific Writing	Language services	2012	1.5
Academic Writing	Language services	2011	2.4
English IV	Language services	2011	2.4
Techniques for Writing and Presenting a Scientific Paper	WGS	2011	1.2
Project and Time Management	WGS	2011	1.5
PhD Competence Assessment	WGS	2010	0.3
Research Methodology: From Topic to Proposal	WASS	2010	4
Mobilising your Scientific Network	WGS	2010	1
Scientific Publishing	WGS	2010	0.3
Working with EndNote	Library	2011	0.3
Information Literacy	Library	2012	0.6
Generalized Linear Models	PE&RC	2012	0.6
Atlas.ti, a hands-on practical	WASS	2011	0.5
<b>II. Mansholt-specific part</b>			
Mansholt Introduction Course	WASS	2010	1,5
Mansholt Multidisciplinary Seminar (PhD Day)	WASS	2013	1
Presentation at International conferences	-	-	6
<b>III. Discipline-specific part</b>			
ICO Introductory Course	ICO	2011	7.1
Research Synthesis including Meta-analysis	ICO	2012	3.5
Qualitative Research Methodology	ICO	2013	3.5
ICO International Fall School	ICO	2012	3.5
Competence Theory and Research	ICO/WASS	2012	4
ICO National Fall School	ICO	On-going	1
Writing Research Proposal	WASS	2010	6
Participating in research meetings at ECS	ECS	2010-2013	3
<b>TOTAL</b>			<b>56.7</b>



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