Entrepreneurship education programmes: How learning, inspiration and resources affect intentions for new venture creation in a developing economy

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Abstract

This paper develops and tests a model of pathways between participation in entrepreneurship education programmes (EEPs) and entrepreneurial intention. EEPs are degree programmes designed to provide mastery and experience over several years of academic study. Structural equation modelling on survey data gathered from 348 graduating students from eight universities in Pakistan showed how three EEP components (learning, inspiration and resources) influence intention: learning and inspiration activities both increase perceived norms for being an entrepreneur and students' perceptions that they can be entrepreneurs (perceived control). Access to incubation resources had the strongest effect on intention by increasing perceived norms which in turn increases positive attitudes and perceived control. These findings provide insight into the conclusions drawn from previous studies by showing how positive student experience across different components of entrepreneurship programme have a positive impact on students' intentions to start their own business.

Keywords: *Entrepreneurship Development, Entrepreneurial Education, Entrepreneurial Intention*

1. Introduction

Entrepreneurship is acknowledged as a vital source of economic growth and a prominent factor influencing a society's socio-economic wellbeing of (McMullan, Long, & Graham, 1986). Schumpeter (1911; 1934) considers the entrepreneurial process to be a major factor in economic development and the entrepreneur as the key to economic growth. The evolution of new businesses also opens social prospects. Entrepreneurship is regarded as an essential source of job creation, poverty reduction, innovation and societal development as well as economic competitiveness (Liñán, Rodriguez-Cohard & Rueda-Cantuche, 2011; Wu, Kuo, & Shen, 2013). Hence, a steady growth of business creation is necessary for social wellbeing as well as for economic development.

The formalisation of entrepreneurship education in developed nations has been linked by scholars in developing countries to economic growth (Muhammad, Akbar, & Dalziel, 2011) and to a view that university graduates can be considered potential entrepreneurs with a stronger tendency than non-graduates to start their own businesses (Zainuddin, 2012). One result of these observations has been the development of specialist entrepreneurship education programmes (Kourilsky & Walstad, 1998).

Entrepreneurship education is an instrument used to enhance entrepreneurial activity (Bischoff et al., 2017). An increasing number of universities offer degree courses—often at postgraduate level—designed to impart, in addition to the generic skills of all university graduates, the specific knowledge necessary for the effective creation and successful continuation of entrepreneurial ventures. Nonetheless, policies and efforts to increase entrepreneurial attitudes, intentions and action among graduates are hampered by a lack of a common understanding of the educational objectives, content, methodology and resources needed to develop entrepreneurs (e.g. Fayolle 2013; Fayolle et al. 2006; Fayolle and

Degeorge 2006; Fayolle and Gailly 2015; Kyrö 2005; Nabi, Liñán, Fayolle, Krueger & Walmsley, 2017; Nabi, Walmsley. Liñán, Akhtar & Neame, 2018).

Much debate exists about whether entrepreneurship education programmes can enhance the strengths, and overcome the limitations, associated with individual characteristics (such as openness) and personal circumstances (such as family background) (Jamieson, 1984; Liñán, 2004). The debate becomes more complicated when considering the economic and business context in which an individual might practice entrepreneurship. Several authors have noted, over the past decade, that entrepreneurship education is relatively new, and research to date reaches contradictory conclusions about its effectiveness and value (Fayolle & Gailly, 2008; Martin, McNally & Kay, 2013; Nabi et al. 2017; Nabi et al., 2018; Rauch & Hulsink, 2015; O'Connor 2013; Von Graevenitz, Harhoff & Weber, 2010). To understand the apparent contradictions, it is necessary to examine the role of, not only individual programmes, but also the context for entrepreneurial practice in which they are undertaken.

At the same time, entrepreneurial attitudes, intentions and behaviours develop and change over time (Lee & Wong, 2004). Lee and Wong offer a *lifecycle* view of entrepreneurial development. The lifecycle view recognises that the decision to establish a new venture might be affected by the entrepreneurs' personal experiences over time—including their formal educational experiences along with their experiences of the opportunities for and barriers to entrepreneurship afforded by their environment. In turn, these experiences are likely to influence the beliefs and attitudes that affect entrepreneurial intentions and, when circumstances permit, entrepreneurial behaviour. In this study, concepts from the entrepreneurial lifecycle approach are adopted to examine how graduates' experiences of their entrepreneurship education affect their intentions to establish new ventures.

This research contributes to the entrepreneurship literature by uncovering how the different components of an entrepreneurship course influence entrepreneurial attitudes and intentions. Locating this research in Pakistan, where on-going conflict limits opportunities for entrepreneurial action, also permits a consideration of the potential for environmental and contextual factors to play a role in the conversion of entrepreneurial intention into entrepreneurial behaviour. The new knowledge developed here improves the evidence base for the design and evaluation of entrepreneurship education programmes at programme, university and policy levels.

This study therefore reviews the literature on the development of university graduates' entrepreneurial intention in the section below. Sections 3 and 4 present the methods and the results, respectively. Finally, in Section 5, the findings are linked with the literature to highlight the study's theoretical contributions and practical implications.

2. Motivation for entrepreneurship

Motivation for entrepreneurship is complex and involves the dynamic interaction of a number of factors (Ahmed, Chandran, & Klobas, 2017a, Nabi, Holden, & Walmsley, 2006). Different scholars and researchers understand entrepreneurship differently and have come up with distinct and conflicting conclusions about how to boost and harness it for development (Kakouris and Georgiadis 2016). This section begins by introducing the literature of the two major schools of thought about the proximal cause of entrepreneurship, before focusing on arguments that entrepreneurial intention and its formation are key to the process of new venture creation. It then examines the role of education in motivating and forming entrepreneurs, which might enable individuals to act on their entrepreneurial intention and carry out an entrepreneurial action.

This review of the literature takes account of the different terminologies used to describe entrepreneurial intention and consequent behaviours in different fields of study over

many years. Thus, models and studies of the antecedents of "self-employment" are included where it is clear that the self-employment described requires the development of a new venture (Kolvereid, 1996; Krueger, Norris, Reilly & Carsrud, 2000; Luthje & Franke, 2003). Similarly, models and studies of the antecedents of a "business start-up", where the individual entrepreneur (as distinct from macro-level institutional factors) is the focal point of the model, are also included.

2.1 Entrepreneurship as natural behaviour

The earliest studies and theories of entrepreneurship explored personal characteristics and their relationship to venture creation (McClelland, Atkinsons, Clark & Lowell, 1953). Later studies of the entrepreneurial career choice focused on the role of psychological and demographic factors such as personality, personal history and, in some cases, the social context in determining individuals' choices and preferences (Dyer & Handler, 1994; Robinson, Stimpson, Huefner & Hunt, 1991).

Although research designed to understand how personality and demographic characteristics are associated with entrepreneurship has contributed to understanding the emergence of business ventures, the findings are still considered vague and questionable. Personality theory and demographic approaches cannot adequately account for entrepreneurship (Gartner, 1989; Shane & Venkataraman, 2000). It is therefore important to turn to more recent research, in the next section, which focuses on the contribution of an entrepreneurial intention to new venture creation.

2.2 Entrepreneurship as intentional, planned behaviour

According to theories that focus on entrepreneurial intention (EI), this intention is the most important concept for understanding the new firm creation process. Kirby and Ibrahim (2011) go further to argue that entrepreneurship is not only intentional but also pre-planned. In this sense, the process by which EIs are formed is critical to the evolving and sometimes

long process of venture creation (Lee & Wong, 2004; Fayolle, Gailly, & Lassas-Clerc, 2006; Kolvereid, 1996). Thus, EI plays a pivotal role in understanding the association between an individual and a new business venture (Bird, 1988; Krueger & Carsrud, 1993).

EI, in general terms, can be defined as an individual's conscious awareness and determination to set up a new business venture (Bird, 1988; Hmieleski & Corbett, 2006; Thompson, 2009). Much current research on entrepreneurial behaviour is directed towards the prediction of EI rather than entrepreneurial behaviour or new venture creation (Fayolle & Liñán, 2014; Liñán & Fayolle, 2015). This approach is supported by research that shows that intention is a good predictor of actual behaviour in many different contexts (Armitage & Conner, 2001; Sutton, 1998).

Two models are at the core of the entrepreneurship literature for predicting intention. Both models propose that the formation of intention precedes behaviour, but there are differences in how the models treat the formation of intention and the mechanisms by which intention is translated into behaviour. The entrepreneurial event model (EEM) proposed by Shapero and Sokol (1982) is specific to entrepreneurship and explains EI by means of perceived desirability, perceived feasibility and propensity to act. The second model is a generic model of human behaviour proposed by Ajzen (1988, 1991), the theory of planned behaviour (TPB), which offers an insight into how perceived desirability and feasibility can be influenced by precursors such as education and experience, as well as how the entrepreneurial environment can affect perceptions of feasibility and strengthen or dampen the effect or propensity to act on actually taking action.

The three antecedents of intention in the TPB are called *attitude*, *subjective norm* and *perceived behavioural control* (PBC). Attitude encompasses perceived desirability, while PBC incorporates perceptions of feasibility, as discussed below. Propensity to act is represented by intention, which is defined as "readiness to act" (Fishbein and Ajzen, 2010, p.

21). The robustness of the TPB across many domains of human behaviour has been validated by a significant number of scholars (Lortie & Castogiovanni 2015; Peterman & Kennedy, 2003; Liñán & Chen 2009; Guerreroetal, 2008; Kolvereid, 1996; Tkachev & Kolvereid, 1999; Krueger et al., 2000). Furthermore, the TPB has shown resilience over time as a model of both the formation of EI and the relationship between EI and entrepreneurial action (Ahmed, Chandran, & Klobas, 2017b, Kautonen, van Gelderen & Fink, 2015; Kolveried, 1996; Samsudin et al., 2016; Zhang et al., 2014).

2.3 Hypothesis development

Keeping in mind the tenet that entrepreneurial behaviour is planned behaviour (towards a specific goal such as venture creation or starting a business) which follows from the formation of an intention to become an entrepreneur, this section maps the TPB to EI.

2.3.1 Theoretical base: The theory of planned behaviour

Contextualising the TPB to the domain of business start-ups and entrepreneurship, three factors account for variations in entrepreneurial intention:

- *attitude towards entrepreneurial behaviour*, e.g., towards starting one's own business as compared to being employed in the service of others (Kolvereid, 1996);
- *subjective norm* or perceived social pressure (Fishbein & Ajzen, 2010) from peers, family and society to become (or not to become) an entrepreneur (Krueger et al., 2000); and
- *perceived control for entrepreneurship*, which refers to one's perception that one can take the actions necessary to become an entrepreneur.

Thus, intentions-based models offer a great deal to entrepreneurship researchers. Entrepreneurial activity is a planned behaviour that requires the formation of intent, and an understanding of how EI is formed provides a look into the important and interesting process

by which an individual decides to initiate an entrepreneurial career (Katz & Gartner, 1988). This reasoning is behind four base propositions:

Hypothesis 1.1 *The stronger the intention to become an entrepreneur, the more likely an individual will start his or her own business.*

Hypothesis 1.2 *The stronger the attitude towards being an entrepreneur, the stronger the individual's intention to start his or her own business is.*

Hypothesis 1.3 *The stronger the subjective norm for entrepreneurship, the stronger the individual's intention to start his or her own business is.*

Hypothesis 1.4 *The stronger the perceived control for entrepreneurship, the stronger the individual's intention to start his or her own business is.*

Under some circumstances, subjective norms appear to affect attitude and perceived behavioural control. While entrepreneurial values from society can affect an individual's own beliefs and perceptions, so can social norms from family, friends or other relationships. These, in turn, can affect attitudes and perceptions of control (Ajzen, 1991; Liñán & Chen, 2009). Strong perceptions of social pressure to be an entrepreneur might be reflected in a more positive attitude towards entrepreneurship and also in stronger perceptions of behavioural control. Therefore, it is hypothesised that:

Hypothesis 1.5 *Subjective norms for being an entrepreneur have a positive impact on*

a) *the attitude towards entrepreneurship, and*

b) *perceived behavioural control.*

The proposition that intention predicts behaviour, over which individuals have control, is an important characteristic of the TPB, which distinguishes between actual and perceived control over behaviour (Fishbein & Ajzen, 2010). Actual environmental and contextual conditions can prevent or suppress the translation of intentions into behaviours

(Ajzen, 2005). At the same time, an individual's awareness of actual barriers can affect his/her perceptions of control. In this way, PBC can have an empirical effect, not only on intentions, but also on their realisation. Thus, in line with the TPB, perceived control for entrepreneurship is likely not only to contribute to the formation of entrepreneurial intention but also to be involved in the subsequent emergence of the intended new business venture leading to

Hypothesis 1.6 *Perceived behavioural control for entrepreneurship has a direct effect on entrepreneurial behaviour.*

2.3.2 Entrepreneurship education

Entrepreneurship education consists of "any pedagogical program or process of education for entrepreneurial attitudes and skills" (Fayolle et al., 2006, p. 702). Studies of the impact of entrepreneurship education on entrepreneurial attitude, intentions and behaviour report mixed results.

Entrepreneurship education has been observed to have a positive impact on several types of entrepreneurial outcome. Peterman and Kennedy (2003) reported that enterprise education programmes raise the perceived feasibility and desirability of an entrepreneurial career. Participation in such programmes has been observed to develop capabilities for opportunity recognition (DeTienne & Chandler, 2004) and participants have also been found to exhibit stronger entrepreneurial intentions compared to individuals who have not taken any entrepreneurship courses (Galloway & Brown, 2002). Kolvereid and Moen (1997) observed that participants in entrepreneurship education programmes and training courses are more likely to start their own businesses than non-participants.

Several other studies have found no positive effect. For example, Mentoor and Friedrich (2007) conducted a field experiment which led them to conclude that participation in entrepreneurship classes (within a general management course) did not improve

entrepreneurial intentions. In a more extreme result, Oosterbeek et al. (2010) conducted a longitudinal study among undergraduate students and found that their intentions to start their own business declined after completing an entrepreneurship course.

The participants in both studies were drawn from a single university, suggesting that these contradictory results might reflect specific aspects of the courses, students, entrepreneurial environment, or a combination of these factors. Two possible explanations are of particular interest for this study: entrepreneurship courses and environment.

Firstly, most studies of entrepreneurship education take a holistic approach, analysing the impact of an entrepreneurship course or an entire entrepreneurship education programme. However, entrepreneurship education takes several forms, from a single course of study in a broader business or engineering degree to a full degree in entrepreneurship, or *entrepreneurship education programme* (EEP). EEPs consist of several components including course content (e.g., lecture material, guest speakers, online resources, modes of delivery, etc.), and course goals (e.g., learning introductory concepts and theory compared to learning specific skills) and, thus, offer an opportunity to study how the effects of different aspects of entrepreneurship education influence the outcomes of EEP interventions (Martin, McNally, & Kay, 2013).

Secondly, the establishing of an entrepreneurial venture occurs in a specific context. Regardless of how intentions are formed, the entrepreneurial environment in which those intentions might be realised varies widely. Therefore, investigating the effects of contextual moderators between EI and venture creation is required to better understand why this relationship is inconsistent and ambiguous (Shinnar, Hsu, & Powell, 2014).

Thus, the current study proposes that the outcomes of EEPs, characterised as *entrepreneurship education benefits*, can be examined by employing a conceptual model and methodology that allow identifying the differential effects of different components of

entrepreneurship education programmes. At the same time, it takes into account the possible moderating role of contextual factors, represented by participants' perceptions of the actual barriers to entrepreneurship that exist in their environment[1].

2.3.3 Entrepreneurship education benefits and entrepreneurial intentions

Broadly speaking, two theoretical perspectives have been adopted to study the link between entrepreneurship education and entrepreneurial intentions (Bae, Qian, Miao, & Fiet, 2014): human capital theory (Becker, 1975), and entrepreneurial self-efficacy (Chen, Greene & Crick, 1998). Human capital theorists are concerned with "the skills and knowledge that individuals acquire through investment in schooling, on the job training and other types of experience" (Becker, 1975; Unger, Rauch, Frese & Rosenbusch, 2011, p. 343) as determinants of entrepreneurial intentions (Davidsson & Honig, 2003). Self-efficacy theorists associate entrepreneurship education with the development of self-efficacy for entrepreneurship, arguing that developing a stronger belief in one's ability to successfully perform the various roles and tasks of entrepreneurship increases entrepreneurial intentions (Chen et al., 1998; De Noble, Jung & Ehrlich, 1999; Douglas, 2013; Fitzsimmons & Douglas, 2011; Krueger et al., 2000; McGee, Peterson, Mueller & Sequeira, 2009; Scott & Twomey, 1988;–Wang, Wong & Lu, 2002; Wilson, Kickul & Marlino, 2007; Zhao, Seibert & Hills, 2005). Nabi et al.'s (2017) review of the entrepreneurship education literature identifies several other ways in which entrepreneurship education might strengthen EI.

Firstly, entrepreneurship education offers an opportunity for students to repeatedly engage in a task, both learning about the task and how to perform it, and developing confidence in their ability to perform related tasks successfully in the future. For example, by conducting a market analysis, pitching an idea, or writing a business plan as part of an

[1] Perceived barriers differ from perceived control: an individual can perceive that a barrier exists and, at the same time, believe that they have sufficient control over their actions to be able to overcome that barrier.

entrepreneurship course assignment, students learn how to perform these entrepreneurial tasks and develop stronger self-efficacy for their performance. These outcomes can be described as *learning benefits*.

Entrepreneurship education also involves exposure to role models through guest speakers or case studies of real entrepreneurs designed to inspire students to consider the positive aspects of entrepreneurship as a life or career path. Role models also model perceived control or self-efficacy for overcoming barriers and difficulties that they might meet on the way. Entrepreneurship courses may therefore strengthen or trigger *inspiration* to become an entrepreneur (Vaizler, 2011).

Third, entrepreneurship education provides opportunities for formal and informal interaction with instructors and peers, in many cases extending to observation and participation in practice through competitions, internships or business incubators. In their study of the perceived benefits of EEPs for science and engineering students in two major European universities, Souitaris, Stefania and Andrea (2007) observed that such activities in EEPs do more than inform and inspire. They also arouse emotions and trigger events that change the mindset of the graduates, resulting in positive attitudes towards entrepreneurship (Bae et al., 2014; Gaweł & Pietrzykowski, 2015; Martin, et al., 2013; Nabi et al., 2018).

These theoretical arguments and empirical observations suggest a series of relationships. Firstly, formal entrepreneurial education programmes offer benefits in terms of content learning, inspiration and practice. Viewed from the TPB perspective , these entrepreneurial education benefits are likely to affect EI indirectly via one or more of its three direct antecedents (attitude, social norm and perceived control). It is therefore hypothesised that each of the three identified benefits of entrepreneurship education affects each of the antecedents of entrepreneurial intentions:

Hypothesis 2.1 *The greater the learning from an entrepreneurship education programme, the stronger will be:*

a) *the attitude towards being an entrepreneur,*

b) *the subjective norm, and*

c) *the perceived control for entrepreneurship.*

Hypothesis 2.2 *The greater the inspiration from an entrepreneurship education programme, the stronger will be:*

a) *the attitude towards being an entrepreneur,*

b) *the subjective norm, and*

c) *the perceived control for entrepreneurship.*

Hypothesis 2.3 *The greater the utilisation of business incubation resources, the stronger will be:*

a) *the attitude towards being an entrepreneur,*

b) *the subjective norm, and*

c) *the perceived control for entrepreneurship.*

Figure 1 shows the conceptual framework defined by the three sets of hypotheses.

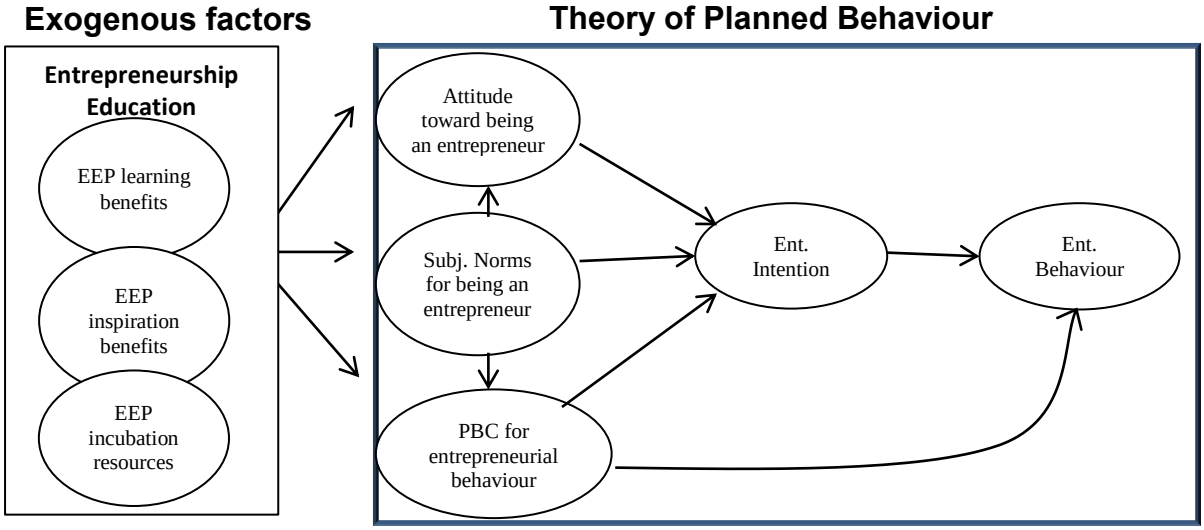

Figure 1. *A model of entrepreneurial intention and action; Subj. = Subjective, Ent. = Entrepreneurial*

3. Methods and materials

3.1 Sampling, procedure and data collection

University students nearing the end of their studies have a relatively high propensity towards starting a firm (Reynolds et al., 2002). They are often participants in entrepreneurship research (Fayolle & Gailly 2004; Kolvereid 1996; Krueger et al. 2000; Tkachev & Kolvereid, 1999; Veciana, Aponte, & Urbano, 2005), and a similar sample was used in this study.

Eight well-known universities offering entrepreneurship education programmes in three metropolitan cities of different provinces of Pakistan agreed to support the study. All of these universities have a stated objective to develop entrepreneurial attitudes in students and produce more entrepreneurs.

Data were collected from students during class, with the teacher's permission. The purpose of the study, and the voluntary and confidential nature of responses, was explained to the students before handing out the questionnaires. Thus, students were assured that they could return an empty or incomplete questionnaire without their teacher knowing who had and who had not participated in the study.

There were 760 final year entrepreneurship students across these eight universities. The leading researcher distributed 480 questionnaires–approximately 60 at each university, in classes selected by student level and time of day. He collected questionnaires in the same session, and 421 were returned, a response rate of 87.7%. After removing surveys with a high percentage of missing responses (59) and evidence of response or acquiescence bias (14), data from 348 students was available for analysis.

The majority of the students enrolled in the entrepreneurship education programmes are male, which was reflected in the high proportion of male respondents (255, 73.28%). The sample consisted of 195 undergraduates (56.03%) and 160 master's degree students. The

participants' ages were mostly in line with this distinction; 44.26% of participants were undergraduates aged 18 to 22 and 32.76% were young graduate students aged 23-26.

3.2 Measurement

All the variables were measured using multi-item scales developed and tested in earlier research by different groups of researchers. The items are listed, by variable, with factor loadings in Table 2. The responses were measured, in most cases, on a five-point scale from 1 *not at all* to 5 *to a large extent*.

2.1 Entrepreneurial behaviour

Entrepreneurial behaviour (BEH-E) was measured using the logic of Souitaris, Zerbinati, and Al-Laham (2007), who characterised entrepreneurship students as nascent entrepreneurs who can be involved in real business activities at the same time as studying, particularly during their final year. Souitaris et al. (2007) drew on the earlier work of Alsos and Kolvereid (1998), asking survey participants to indicate which of 19 start-up activities they undertook. Fourteen of these activities were included in the questionnaire after omitting five activities which pilot study participants did not engage in.

The students were first asked "Are you involved in evaluating a new business idea?" Those who answered "No" (2%), scored 1 (the lowest possible score) for BEH-E. Those who answered "Yes" were directed to the next question which asked "Are you trying to start your own business?" Those who answered "No" to this question (1%) also scored 1. The students who answered "Yes" to the second question (97%) were asked to indicate the extent of their involvement in starting their own business by rating each of the 14 activities using the common response scale (see Section 2.2). Three of the 14 activities were omitted from the calculation of the final score due to their very low involvement (< 5%). BEH-E was therefore calculated as a mean involvement in the 11 activities which cover business planning, financing and interaction with the external environment.

3.2.2 Entrepreneurial intention

Six items to measure entrepreneurial intention (EI) were adopted unchanged from Liñán and Chen (2009). The items were measured with the common response scale for this study. The measurement scale is provided in the appendix A.

3.2.3 Antecedents of entrepreneurial intention

The immediate antecedents of EI–attitude towards entrepreneurship (ATT-E), subjective norm for entrepreneurship (SN-E), and perceived control for entrepreneurship (PBC-E)–were measured using items drawn from a scale developed by Kolvereid (1996). The items referred to different attitudinal, normative and control factors which are theoretically important in becoming an entrepreneur, and the students were asked to indicate, using the common response scale, the extent to which each factor was important to them in pursuing their "professional career".

3.2.4 Benefits of entrepreneurship education programmes

Items developed by Souitaris et al. (2007) were used to measure the students' perceptions of the benefits of entrepreneurship education programmes. Five items measured learning benefits (EEP-L). To tap inspiration benefits (EEP-I) the students were asked to recall any particular event or input during their entrepreneurship programme that changed their "heart or mind" by ticking event types they recalled on a list (similar to Nabi et al., 2018). They were then presented with six potential programme-related triggers of inspiration for entrepreneurship and asked to rate "To what extent have such events made you seriously consider embarking on an entrepreneurial career" on the standard five-point scale. An 11-item list of incubation resources for entrepreneurship education programmes compiled and validated by Souitaris et al. (2007) was used to measure the utilisation of resource benefits (EEP-R). For this set of items, the response scale was modified for ease of comprehension to a five-point scale ranging from 1 *not at all* to 5 *more than ten times.*

3.3 Analytical techniques

Covariance-based structural equation modelling (SEM) in AMOS was used to test the hypotheses. The two-stage modelling process recommended by Anderson and Gerbing (1988) was followed, after missing value imputation with the Expectation-Maximisation (EM) algorithm of Graham et al. (1997).

Confirmatory factor analysis (CFA) was used to develop a measurement model before the estimation of the structural model to test hypotheses 1.1 to 1.6 and 2.1 to 2.3. Several items with low loadings or cross-loadings were removed before proceeding, as can be seen in the final measurement model in Table 2. Model fit was evaluated by examining two absolute fit indices: chi-square (χ^2), chi-square/degree of freedom (χ^2/DF) and root mean square error of approximation (RMSEA). The comparative fit index (CFI) and Tucker Lewis Index (TLI) were used to measure incremental fit. Rules of thumb for these indexes are provided with the measurement model fit statistics in Table 1. The *p*-value of χ^2/DF is not reported as it is not expected to be statistically significant in complex models with large samples (Hair et al., 2010).

3.3.1 Measurement model Assessment and CFA

3.3.1.1 Model fit indicators

As shown in Table 1, the measurement model exceeded the rules of thumb for absolute fit but were below common criteria for incremental segmentation. Indices exceeded their respective common acceptance levels as suggested by previous research, thus demonstrating that the measurement model exhibited a fairly good fit with the data collected (χ^2/DF = 2.99, RMSEA = 0.076, CFI = 0.81, TLI = 0.79) and CFI=0.81. Although higher incremental fit indexes were desirable, the study proceeded, in part on the basis of the satisfactory absolute fit statistics, but also because SEM takes measurement limitations into account when estimating structural effects.

Table 1. Goodness-of-fit indices for the measurement model

Fit index	Cited	Rule of thumb	Result	Fit (yes/no)
χ^2			1589.22	
DF			530	
χ^2/DF	Kline (2010)	1.00 - 5.00	2.99	Yes
RMSEA	Steiger (1990)	< .08	0.08	Yes
CFI	Byrne (2010)	> .90	0.81	No
TLI	Tucker and Lewis (1973)	> .90	0.79	No

Note: χ^2 = chi square, DF = degree of freedom, CFI = comparative-fit-index, TLI = Tucker-Lewis coefficient index, RMSEA = root mean square error of approximation.

3.3.1.2 Reliability and Validity

The assessment of the measurement model was done through construct reliability as well as discriminant validity. Cronbach's coefficient alpha was used to measure the reliability of each of the core variables in the measurement model. It ranged from .71 to .85, exceeding the recommended value of 0.7 (Kannan and Tan, 2005; Nunnally and Bernstein, 1994). Additionally, for testing construct reliability, the composite reliability (CR) values ranged from .72 to .88, higher than .7 (Werts et al., 1974; Kline, 2010; Gefen et al., 2000), which indicates that construct reliability is fulfilled as shown in Table 2. Factor loadings greater than .5 were considered to be significant (Hair et al., 2010). The loadings for all the items retained exceeded .5 as shown in Table 2.

Table 2. Variables in model: Descriptive statistics, measurement model, reliability

Latent variable	Item	Loading	M	SD	α (>0.7)	CR
Attitude towards entrepreneurship (ATT-E)	ATTQ1: Autonomy	.65	3.8	0.60	.83	.83
	ATTQ2: Self-realisation	.78				
	ATTQ3: Economic opportunity	.73				
	ATTQ4: Challenge	.70				
	ATTQ5: Authority	.58				
	ATTQ6: Participate in the whole process	.60				
Subjective Norms (SN-E)	SNQ1: family members	.62	3.6	0.87	.85	.83
	SNQ2: Friends	.66				
	SNQ3: colleagues	.82				
	SNQ4: fellow graduates	.82				
	SNQ5: local business community	.70				
Perceived behavioural control	PBCQ2: own business	.61	3.31	0.04	.73	.76
	PBCQ3: events beyond your control	.76				

	PBCQ4: ability to be successful	.72				
	PBCQ5: the failure chances	.54				
Entrepreneurial Intentions (EI)	EIQ1: to do anything	.59	3.6	0.71	.78	.75
	EIQ2: professional goal	.81				
	EIiQ3: every effort	..80				
	EIQ4: determined to create a firm	.54				
	EIQ5: seriously thought	.53				
Entrepreneurial behaviour (BEH-E	EBQ1- preparing a business plan	.52	2.2	0.70	.76	.86
	EBQ2- organized a start-up team	.93				
	EBQ3- acquired the facilities/	.54				
	EBQ4- applied for a license patent	.65				
	EBQ5- business registration	.96				
Entrepreneurship Education learning (EEP-L)	EELQ1: understanding of the attitudes	.73	3.9	0.49	.74	.75
	EELQ2: understanding of the actions	.77				
	EELQ3: your practical management skills	.62				
Entrepreneurship Education Inspiration (EEP-I)	EEPQ1: views of a professor	.62	2.4	0.94	.71	.72
	EEPQ2: views of an external speaker	.69				
	EEPQ3: views of a visiting entrepreneur	.75				
Entrepreneurship education: Incubation resources (EEP-R)	EERQ1: classmates for building a team	74	2.4	0.05	.77	.78
	EERQ2: Networking events	.76				
	EERQ3: Business plan competitions	.55				
	EERQ4: Seed funding from university	.70				

Note: All items measured from 1 (most negative) to 5 (most positive). Loadings are standardised and only items with loading > .5 included. M = mean; SD = standard deviation; AVE = Average Variance Extracted; CR = Construct Reliability.

To examine if the data met the assumptions of maximum likelihood estimation, multivariate normality was tested via Mardia's coefficient[2]. Results from this test revealed that the data were somewhat leptokurtic (Mardia's coefficient = 14.39). As a result, bootstrapping was used to obtain bias-corrected standard errors and 95% confidential intervals were used to test the statistical significance of all the parameters.

Discriminant validity was assessed by the Fornell-Larcker (1981) method. Table 3 shows that the shared variance in each pair of constructs is lower than the minimum of the average variance explained (AVE) of each construct in the pair, confirming discriminant validity.

[2] Reported as multivariate kurtosis in AMOS.

Table 3. Discriminant validity and latent variable correlations

Construct	Attitude	SN	PBC	Intention	Learning	Inspiration	Resources	Behaviour
Attitude	**0.91**							
SN	.53*	**0.92**						
PBC	.18*	.17*	**0.85**					
Intention	.14*	-.002	.43*	**0.88**				
Learning	.21	.28*	-.08	-.15*	**0.87**			
Inspiration	.15**	.17*	-.11	-.09	.27*	**0.86**		
Resources	.19**	.38*	.08	-.08	.27*	.08	**0.84**	
Behaviour	.19**	.17*	-.03	-.08	.14*	.02	.10	**0.88**

Note: Values in the diagonal (bolded) represent the square root of the AVE and the off-diagonals represent the correlation. * $p < .05$; ** $p < .01$.

3.3.2 Effects of entrepreneurial education (Hypotheses 1.1 to 1.6 and 2.1 to 2.3)

Once a satisfactory measurement model was developed, SEM with maximum likelihood estimation was used to test the path of effects from entrepreneurship education programmes through the antecedents of EI to EI. The goodness of fit indexes used to estimate measurement model fit were used to assess the structural model fit. The full structural model, as presented in Section 4, met the fit criteria. However, for simplicity of presentation of the results, all non-significant paths were removed one by one and the model re-estimated (Byrne, 2001).

4. Findings

4.1 Entrepreneurship education, intention and behaviour

Six non-significant paths were deleted, one at a time, beginning with the path with the lowest β coefficient (the path from perceived behavioural control to entrepreneurial behaviour, β = .003, p =.96), followed by the paths from EIs to entrepreneurial behaviour, resources to perceived behavioural control, from gaining inspiration from an entrepreneurial educational programme to an attitude towards entrepreneurship, from learning benefits to an attitude towards entrepreneurship, and from resources to an attitude towards entrepreneurship. All the other hypothesised relationships were statistically significant and in the predicted direction, as shown in Figure 1**.** After removing all the non-significant paths, all

the goodness-of-fit indices exceeded their respective common acceptance levels as suggested by previous research, thus demonstrating that the structural model exhibited a fairly good fit with the data collected (χ^2/df = 2.20, RMSEA = 0.06, CFI = 0.97, TLI = 0.92).

Attitude towards:-

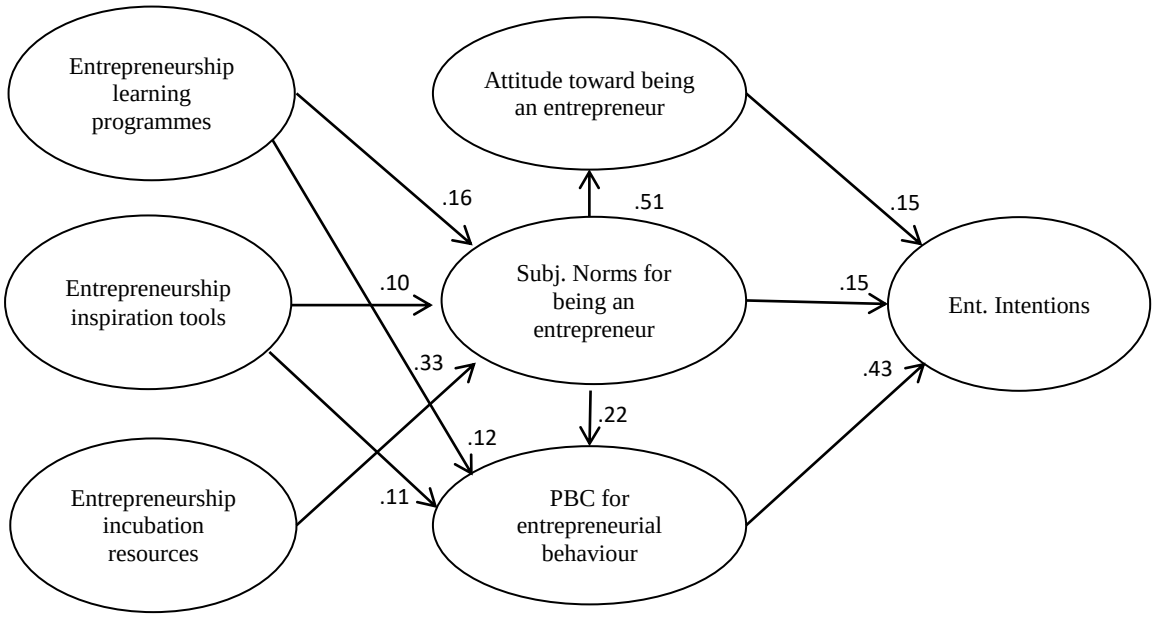

Figure 2. *Statistically significant paths between entrepreneurship education programme elements, antecedents of entrepreneurial intention and entrepreneurial intention*

A more detailed overview of empirical support for the conceptual model of the effect of entrepreneurship education programmes on EI and behaviour appears in Table 4, which provides a summary of support for the hypothesised direct relationships in the model.

Table 4. Overview of support for hypothesised relationships

Hypothesis	Hypothesised path	β	*t* value	R^2	Supported?
Base TPB model of the formation of entrepreneurial intention and behaviour					
1.1	EI to BEH	0.08	1.57	0.01	No
1.2	ATT to EI	0.15	2.62**	0.20	Yes
1.3	SN to EI	0.15	2.65**		Yes
1.4	PBC to EI	0.43	8.82***		Yes
1.5a	SN to ATT	0.51	10.2***		Yes
1.5b	SN to PBC	0.21	3.96***		Yes
1.6	PBC to BEH	0.03	0.64		No
Paths from entrepreneurial education to the antecedents of intention					

2.1a	EEP-L to ATT	0.06	1.28	0.28	No
2.1b	EEP-L to SN	0.16	3.05***		Yes
2.1c	EEP-L to PBC	-0.12	-2.14*		Yes
2.2a	EEP-I to ATT	0.04	1.02		No
2.2b	EEP-I to SN	0.1	2.01**	0.19	Yes
2.2c	EEP-I to PBC	-0.11	-2.13*		Yes
2.3a	EEP-R to ATT	-0.02	-0.53		No
2.3b	EEP-R to SN	0.32	6.51***		Yes
2.3c	EEP-R to PBC	0.02	0.04	0.28	No

*Note: The full variable names are in Table 1. β = Standardised coefficient. * p < .05; ** p < .01; *** p < .001*

Most of the hypothesised relationships in the underlying TPB were supported by the data, as shown in Table 4. Table 4 also shows support for the hypothesised effects of EEP learning benefits (EEP-L) on subjective norms and perceived control for EI (H2.1b and H2.1c); EEP inspirational benefits (EEP-I) on subjective norms and perceived control for EI (H2.2b and H2.2c); and EEP incubation resource benefits (EEP-R) on subjective norms (H2.). Thus, all three of the EEP components have a significant effect on EI, but each component influences intention in a different way. These findings support the conclusions drawn from previous studies which show that formal entrepreneurship education programmes can have a positive impact on students' intentions to start their own business (Al-Laham 2007, Krueger and Brazeal, 1994; Peterman and Kennedy, 2003, Weber 2012).

Table 4 also provides insight into the role of entrepreneurship education programmes in developing perceived control for entrepreneurship. PBC was the only antecedent of EI to be affected by all the components of entrepreneurship programmes. In turn, PBC had the strongest effect of all the antecedents on the development of EI.

5. Discussion

This study investigated how entrepreneurial intention can be developed among university graduates. The empirical evidence supports the view that entrepreneurship education programmes positively impact the development of entrepreneurial intention and the

production of entrepreneurs. These findings are in line with findings of other several studies (e.g., Douglas, 2013; Fitzsimmons & Douglas, 2011).

Theoretically, the use of the theory of planned behaviour to frame this study has enabled us to formalise and empirically test propositions drawn from earlier theory and research on the development of entrepreneurial intentions.

Observing the results in details, we coincide that the entrepreneurship education is an important tool in fostering entrepreneurial activity. Entrepreneurship education positively affect attitudes toward self-employment, subjective norms, perceived behavioral controls, and entrepreneurial intention, these finding contradict the finding of Souitaris et al. (2007), however, in line with the studies including (Armitage and Conner 2001; Autio et al. 2001; Krueger et al. 2000; Liñán and Chen 2009).

Interestingly, learning about entrepreneurship affects not only entrepreneurship attitudes, as earlier researchers have found, but also develops realistic perceived control for entrepreneurship and a sense of social pressure that being educated to be an entrepreneur leads to an obligation to become one. This broad effect reflects the ample scope of entrepreneurship education where activities embrace the major themes of entrepreneurship, including theoretical knowledge, values, motivation, abilities, social skills, networks, experience and intuitions.

Inspirational benefits from participation in dedicated EEPs affected the Subjective norm and perceived control for entrepreneurship among the participants in this study. This suggests that entrepreneurship programmes can inspire students by increasing their perceptions that it is possible to be an entrepreneur. In contrast, (Souitaris et al., 2007) in his study found inspiration was the only predictor variable with significant coefficients in the hierarchical regression models for subjective norms among the antecedence of entrepreneurial intentions and behaviour.

Motivational activities, such as visits and lectures delivered by external speakers, entrepreneurs and professors, have the potential to develop students' confidence in their ability to be entrepreneurs; that is, their self-efficacy for entrepreneurship. Therefore, we support numerous studies conducted in this field (Bandura, 1997; Krueger et al., 2000; Mueller, 2008). In addition, inspirational benefits also affect perceptions of social pressure to become entrepreneurs (SN). However they did not affect participants' attitudes to entrepreneurship. It appears that entrepreneurship students are more inspired by pedagogical techniques and other inspirational activities to know that it is *possible* to become an entrepreneur rather than by imagining what it would be like to *be* an entrepreneur.

The utilisation of incubator resources as part of EEP only effect subjective norms. This pattern of effects is consistent with earlier observations that practical entrepreneurship education activities affect perceptions and beliefs (Chen et al., 1998), with the notable exception of those associated with attitudes. Incubator utilisation involves practice, and typically places entrepreneurship students in groups whose members rely on one another to perform (social pressure) in an environment which offers support for the development of entrepreneurial concepts (increased control). This explanation raises a definitional and methodological issue: although, like earlier studies, this study examined the utilisation of incubator resources, an inclusion of other activities through which the university provides opportunities for hands-on practice might increase the observed effect of EEP resources on entrepreneurial intention and behaviour. One such activity is the field visit, which was not included in the survey questionnaire but was commented on as an important part of an EEP in the interviews. Field visits, internships and work placements might all affect SN and PBC, but also attitudes to becoming an entrepreneur by placing students with practising entrepreneurs so they can observe, and possibly to some extent even experience what it is like to be an entrepreneur.

The results of this study differ from those of Souitaris et al. (2007), who studied the effects of an EEP module taken by science and engineering students as part of their more generic degree. The pedagogical techniques and educational activities of EEPs are designed to provide mastery and experience over a sustained period of study while the EEPs in which Souitaris' students participated devoted relatively little time to entrepreneurship. It is possible that Souitaris et al. (2007) observed different effects because of the shorter and differently structured programme.

The current study is not without limitations. Although the results are consistent with those of studies that find a positive effect of entrepreneurship education on entrepreneurial attitudes, intentions and behaviour, a generalisation of the model adopted here is limited to the national context of Pakistan. Research in different contexts will extend an understanding of commonalities, and differences, in the pathways from entrepreneurship education to new venture creation.

A longitudinal study would separate measures of intention and behaviour over time, as graduates start their own ventures or enter the workforce. Though a longitudinal study is prohibitive, it might still be possible to develop a more sensitive measure of concurrent entrepreneurial behaviour, for example, through interviews with nascent entrepreneurs.

In addition, although this study investigated several previously identified perceived benefits of entrepreneurship education programmes, other to-date unexplored benefits might be considered in future studies, in particular, expected country-specific benefits reflected in the design of entrepreneurship programmes in particular countries under study. Extending the definition of the benefits of entrepreneurship education programmes to include specific local and national outcomes would support public policy-makers and universities as they intensify their activities to develop economies and society by developing entrepreneurs.

6. Conclusion

Although entrepreneurship education programmes have a positive impact on graduates' entrepreneurial attitudes and intentions, barriers in the environment can prevent them from taking entrepreneurial action. Because entrepreneurial behaviour is consequent on the formation of intentions, intentions cannot be acted upon in contexts which prevent action and will not be acted upon when fear of failure is high. It follows that, although entrepreneurship education programmes provide avenues for students to acquire entrepreneurial knowledge, enhance entrepreneurial capabilities and build entrepreneurial skills, such programmes should not be expected to have a direct effect on behaviour. So, entrepreneurship education should not be expected to immediately produce a more entrepreneurial society. Critically, policy-makers and educators need to take both real and apparent barriers to entrepreneurship into account as important elements in the whole process of entrepreneurship development. The structure of entrepreneurship education programmes thus also requires a consideration of specific national (and, potentially, also local) contextual barriers and opportunities.

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Appendix-A
Theory of Planned Behaviour

Coding	Factors
	Attitude Towards Entrepreneurship
ATTQ1: Autonomy	To what extent will starting a business provide you with opportunity to look for independence
ATTQ2: Self-realisation	To what extent will starting a business provide you with opportunity to know about your abilities (self-realization)
ATTQ3: Economic opportunity	To what extent will starting a business provide you with opportunity to have a large share of your salary to be based on results
ATTQ4: Challenge	To what extent will starting a business provide you with opportunity to have a challenging job
ATTQ5: Authority	To what extent will starting a business provide you with opportunity to have authority in making my decisions
ATTQ6: Participate in the whole process	To what extent will starting a business provide you with opportunity to participate in the whole process of business
	Subjective Norms
SNQ1: family members	To what extent is it important to you that your closest ***family members*** think that you should start your own business
SNQ2: Friends	To what extent is it important to you that your ***closest friends*** think that you should start your own business
SNQ3: colleagues	To what extent is it important to you that your ***colleagues and people*** around you think that you should start your own business
SNQ4: fellow graduates	To what extent is it important to you that your ***fellow graduates*** of the entrepreneurship programs think that you should start your own business
SNQ5: local business community	To what extent is it important to you that the ***local business community leaders*** think that you should start your own business
	Perceived behavioural control
PBCQ1: become an entrepreneur	To what extent would it be easy for you to become an entrepreneur
PBCQ2: own business	To what extent would it be easy for you to start your own business
PBCQ3: events beyond your control	To what extent do you believe that the number of events outside your control which could prevent you from being self-employed is numerous?
PBCQ4: ability to be successful	To what extent are you confident that you have the ability to successfully become self-employed
PBCQ5: failure chances will be very low.	To what extent are you confident that the failure chances will be very low
	Entrepreneurial Intentions (EI)
EIQ1: to do anything	To what extent are you ready to do anything to be an entrepreneur
EIQ2: professional goal	To what extent are it is your professional goal is to become an entrepreneur
EIiQ3: every effort	To what extent are you will make every effort to start my own firm
EIQ4: determined to create a firm	To what extent are you are determined to create a firm in the future
EIQ5: seriously thought	To what extent are you are very seriously thought of starting a firm
	Entrepreneurial behaviour (BEH-E
EBQ1- preparing a business plan	To what extent you are involved in preparing business plan
EBQ2- organized a start-up team	To what extent you have Organized start-up team

EBQ3- acquired the facilities/	To what extent you have Acquired facilities/equipment
EBQ4- applied for a license patent	To What extent you have applied for license patent, etc.,
EBQ5- business registration	To What extent you have Business registration
Benefits of entrepreneurship education programmes	
Entrepreneurship Education learning (EEP-L)	
EELQ1: understanding of the attitudes	To what extent did the entrepreneurship program increase your understanding of the attitudes, values and motivation of entrepreneurs
EELQ2: understanding of the actions	To what extent did the entrepreneurship program increase your understanding of the actions someone has to take in order to start a business
EELQ3: your practical management skills	To what extent did the entrepreneurship program enhance your practical management skills in order to start a business
Entrepreneurship Education Inspiration (EEP-I)	
EEPQ1: views of a professor	To what extent did the views of a professor changed drastically your 'heart and mind' and made you to consider becoming an entrepreneur
EEPQ2: views of an external speaker	To what extent did the views of an external speaker changed drastically your 'heart and mind' and made you to consider becoming an entrepreneur
EEPQ3: views of a visiting entrepreneur	To what extent did the views views of a visiting entrepreneur changed drastically your 'heart and mind' and made you to consider becoming an entrepreneur
Entrepreneurship education: Incubation resources (EEP-R)	
EERQ1: classmates for building a team	A pool of entrepreneurial-minded classmates for building a team
EERQ2: Networking events	Networking events
EERQ3: Business plan competitions	Business plan competitions (testing ground for the idea)
EERQ4: Seed funding from university	Seed funding from university