

# Impact of Entrepreneurship Teaching Models on Students' Entrepreneurial Intentions: The Case of Estonia and Hungary

**Jelena Hartsenko**

*Tallinn University of Technology, Estonia*

*Address: Akadeemia tee 3-358, 12618 Tallinn, Estonia*

*E-mail: jelena.hartsenko@ttu.ee*

**Urve Venesaar**

*Tallinn University of Technology, Estonia*

*Address: Akadeemia tee 3-359, 12618 Tallinn, Estonia*

*E-mail: urve.venesaar@ttu.ee*

## Abstract

The current paper examines the impact of entrepreneurship education programmes on students' entrepreneurial intentions in Estonian and Hungarian higher education institutions. Fostering entrepreneurship through entrepreneurship education has recently become part of the national strategic agenda in both countries. Therefore, the paper focuses on distinguishing different components of entrepreneurial intention and teaching models in entrepreneurship education programmes. The secondary data were obtained from the Global University Entrepreneurial Spirit Student Survey. The study is based on the Theory of Planned Behaviour suggested by Ajzen. The survey results show that in general, entrepreneurship education in universities has positively affected the entrepreneurial intentions of students in the short and long-term perspective. However, the supply model of teaching prevails at the universities in the selected countries, and has the strongest influence on attitudes towards entrepreneurship compared with other components of intention (i.e. subjective norms and perceived behavioural control). Hence, the competence model and university context support have quite a moderate influence on attitudes and perceived behavioural control.

JEL classification codes: **A23, I25**

Keywords: **entrepreneurial intention, attitude, teaching model, university environment**

## 1. Introduction

Entrepreneurship is one of the sources of economic growth, competitiveness, job creation and the achievement of public goals, where the role of universities is to provide society with enterprising and entrepreneurial graduates through entrepreneurship education. Entrepreneurship education has been perceived as a way of promoting enterprising attitudes and professional capabilities for mastering an entrepreneurial career after graduation through enhanced graduate business startups and creating more jobs (Rideout and Gray, 2013). However, according to the reports of the European Commission, the establishment of entrepreneurship education within the practice of the national education system has remained scarce and not sufficiently integrated into higher education institution curricula (European Commission, 2008; European Commission, 2010).

Extensive research using an intention model in the field of entrepreneurship has been conducted based on the Theory of Planned Behaviour (TPB) suggested by Ajzen (1991). A number of previous studies have shown a correlation between the entrepreneurial intention of students and the participation in entrepreneurship education and training (e.g. Fayolle et al., 2006; Fitzsimmons & Douglas, 2011; Almobaireek & Manolova, 2012; Küttim et al., 2013). Some other studies have found a negative outcome from entrepreneurship education (e.g. Oosterbeek et al., 2010). The latest reviews (e.g. Bae et al., 2014; Rideout and Gray, 2013; Martin et al., 2013; Pittaway and Cope, 2007) have argued different reasons for the contradictory results such as methodological approaches, the use of different pedagogical interventions or contextual factors. This refers to a need for a deeper investigation of the effects of entrepreneurship education programmes and teaching models on different antecedents of entrepreneurial intentions and behaviour (e.g. Pittaway and Cope, 2007; Fayolle and Gailly, 2015). Studies have shown different results in different countries in terms of student entrepreneurial attitudes and intentions to start with their own businesses (e.g. Engle et al., 2010; Iakovleva, Kolvereid and Stephan, 2011; Kristiansen and Indarti, 2004). But still a few studies have been carried out on intention-based models and the impact of entrepreneurship education in different contexts, particularly in countries with developing or entrepreneurially young contexts. This also holds true for Estonia and Hungary, both rapidly developing new EU member countries. Fostering entrepreneurship through entrepreneurship education programmes has recently become a part of the national strategic agenda in both countries. It is of essential importance to critically evaluate how entrepreneurship education contributes to the development of entrepreneurial intentions and its antecedents in different contexts. The time component is also important to consider in entrepreneurship research (Bruyat and Julien, 2000), which in the current context includes a possible change of attitudes, perceptions and intentions over time.

The aim of this paper is to find out the teaching models used in entrepreneurship education in Estonian and Hungarian higher education institutions, which have the greatest affect on the antecedents of entrepreneurial intention. Different groups of students (by study level, specialist field, gender, family background, university, etc.) are considered in the short-term and long-term perspective (i.e. after studies and five years after graduating). The teaching model framework, suggested by Bechard and Gregoire (2007) is used to cover a broad range of teaching programmes. However, the suggested classification of teaching models (supply, demand, competence, hybrid model) needs some adjusting to suit the secondary data of the survey used for the analysis here. Still, the division of different

entrepreneurship education courses remains quite evaluative because entrepreneurship courses are heterogeneous in universities using different pedagogical approaches, content, teaching processes and assessment procedures. Therefore, the results of the analysis may be approximate and may only show general trends.

The current study contributes to a better understanding of the impact of different teaching models on student entrepreneurial intentions in the short and long-term perspective. Although, entrepreneurship education in universities has positively affected the entrepreneurial intentions of students, there are some differences in the effect of different teaching models on the components of entrepreneurial intention. The prevailing influence of the supply model may be justified by the contextual factors of the selected countries, since the relatively short history of transition to the market economy requires the increase of student awareness about entrepreneurship first for the enhancement of their entrepreneurial behaviour. However, the on-going developments of these countries towards innovation-based economies suggest the need to use more competence based learning models in the future.

The results may help policy makers, educational institutions and expert groups to elaborate strategies to support the development of entrepreneurship education programmes in universities contributing to the socio-economic development in East European countries and increasing their competitiveness. Whether similar trends could be found in other countries with a similar history may be a task for future research.

The paper has been organised as follows: The theoretical framework describes the conceptual framework of the research. Next, data and methods are discussed. After that, the results of the study are presented. Finally, the study results are concluded.

## 2. Theoretical Framework: Entrepreneurship Education and Entrepreneurial Intention

Entrepreneurial intention has been a rapidly evolving field of research in five different directions, determined by Linan and Fayolle (2015). The current research addresses one of these directions – the interrelationship between entrepreneurship education and its participants' entrepreneurial intentions. Extensive research using the intention model in the field of entrepreneurship education has been conducted to improve our understanding of the entrepreneurial intention of students (e.g. Krueger and Brazeal, 1994; Tkachev and Kolvereid, 1999; Peterman and Kennedy, 1997; Autio et al., 1997; Linan 2004; Souitaris et al., 2007) and of other categories of individuals. The results of this research reveal significant differences in terms of attitudes and intention levels among students who have taken part in entrepreneurship education programmes and those who have not. Despite similar results by different studies, it has been stated that little knowledge is still available regarding the potential causal link between some educational variables (e.g. the content of courses and the pedagogical approach) and the impact of entrepreneurship education programmes on the antecedents of intention (Fayolle and Linan, 2014). Also Pitaway and Cope (2007) have called for a deeper investigation of the link between student entrepreneurial outcomes and different pedagogical methods.

Some previous studies have investigated a conceptual framework in entrepreneurship education to discuss various types of entrepreneurship teaching programmes (Bechard and Gregoire, 2005, 2007; Fayolle and Gailly, 2008; Souitaris et al., 2007). Bechard and Gregoire

(2005; 2007) have proposed three specific ‘teaching models’ in entrepreneurship (supply, demand and competence models), expressing the connection between the educator’s knowledge, conceptions and beliefs about teaching entrepreneurship and their teaching behaviour. The *supply model* focuses on behaviourist pedagogical methods, meaning the transmission of knowledge, skills and other abilities from the educator to the learner (Bechard and Gregoire, 2007:264). The *demand model* focuses on answering learning goals, motives and needs of the students, where teachers are conceived as “facilitators” and “tutors” while students are seen as active participants in the learning (Ibid). The *competence model* focuses on active problem solving in real-life situations and includes communicative activities (e.g. seminars, presentations, debates) and knowledge production (e.g. essays, modelling, portfolios) (Bechard and Gregoire, 2007:265). The use of the teaching model framework in the assessment of the influence of entrepreneurship education on student entrepreneurial intention makes it possible to identify empirical evidence of the link between pedagogical models and student entrepreneurial intention.

The study is based on the Theory of Planned Behaviour (Ajzen 1991), which is one of the most widely used models of intention until now. When assessing the efficacy of programmes, the aim to increase the awareness of understanding the values, attitudes and motivations toward entrepreneurship and entrepreneurial intention is seen as the first step toward entrepreneurial behaviour (Kolvereid, 1996; Krueger and Carsrud, 1993, Linan and Chen, 2006). In the theory of planned behaviour, intention means the cognitive representation of a person’s explicit will to adopt a given behaviour, and is considered an immediate antecedent of behaviour (Fayolle and Gailly, 2015). The Theory of Planned Behaviour (TPB) consists of three components that predict the formation of an intention, namely 1) the attitude toward the behaviour (ATE), 2) subjective norms (SN), and 3) the degree of perceived behavioural control (PBC) (self-efficacy). This means that any behaviour requires a certain amount of planning and can be predicted by the intention to adopt the behaviour. The attitude toward the act is the attractiveness of the behaviour or the degree to which the individual holds a positive or negative personal valuation about being an entrepreneur (Ajzen, 1991; Linan and Chen, 2009). Subjective norms measure the perceived social pressure from family, friends or significant others (Ajzen, 1991), referring to people’s perceptions of a particular behaviour. Perceived behavioural control refers to the perception of situational competence and reflects the perceived ability to become self-employed (Linan and Chen, 2009), which according to Bandura (1997), is called self-efficacy.

Numerous studies have empirically tested the model in various settings and received conflicting results (e.g. Krueger, Reilly and Carsrud, 2000; Kolvereid and Isaksen, 2006). At the same time, previous research has stated that the exogenous factors such as entrepreneurship education influencing the formation of entrepreneurial intentions have not been comprehensively investigated (e.g. Fayolle and Gailly, 2015). Also, additional investigation is needed for a better understanding the role of the context of different institutions (e.g. universities) and countries influencing the entrepreneurial intentions of students (e.g. Raij et al., 2016). Moreover, there is a gap in knowledge about the use of TPB in countries with developing market economies; for example, Central and Eastern European countries. According to Iakovleva and Solesvik (2014), TPB may be particularly suitable for studying entrepreneurial intentions in post-Soviet countries. The findings of previous research have indicated stronger entrepreneurial intentions in respondents from developing countries than those from developed countries (Iakovleva, Kolvereid and Stephan, 2011). Moreover, the

respondents from developing countries also score higher on the antecedents of entrepreneurial intentions than respondents from developed countries (Ibid). However, there is a lack of research that links entrepreneurial intentions to different teaching programmes.

Several empirical research papers have shown that the availability of entrepreneurship education (EE) courses in universities has a positive effect on changing values, attitudes and norms (Thachev and Kolvereid, 1999) as well as on entrepreneurial intentions and the perceptions of self-efficacy (Chen, Greene and Crick, 1998; Noel, 2001). Other research has identified the supportive effect of the creative atmosphere of university (Lüthje and Franke, 2003). Nevertheless, there is also evidence from some studies that have shown a negative effect of entrepreneurship education on student's entrepreneurial intentions (e.g. Lima et al., 2015; Oosterbeek et al., 2010). Various factors may have contributed to that, including the teaching and learning conceptions and process organisation, quality requirements, learning environment and other factors. In some cases, the findings have referred to a need for a more practical approach and the need for larger and more diversified educational offerings of universities (e.g. Lima et al., 2015). Considering the types of different EE courses, previous research has shown that in some cases entrepreneurship education programmes aiming to increase student awareness of entrepreneurship could be useless or even counterproductive for some of the students with prior experience in entrepreneurship (Fayolle and Gailly, 2015).

Considering the above-mentioned gaps in investigating the factors that shape the entrepreneurial intentions of students, the current paper contributes in highlighting the impact of entrepreneurship education teaching models of different content and pedagogy on the entrepreneurial intentions of students (who have participated or not participated in entrepreneurship education programmes). The personal characteristics of students (e.g. age, gender, family experience in entrepreneurship), study level, specialist field, institution, and country are also considered. Based on the theoretical framework, we propose the following hypotheses:

**Hypothesis 1:** The *supply model* (i.e. traditional teaching methods) is most positively related to entrepreneurial attitudes and intentions compared with other teaching models in the selected countries.

**Hypothesis 2:** The effect of entrepreneurship education on student entrepreneurial intentions is stronger when students are involved in both the *supply* and *demand model* (i.e. business planning and business idea contests).

**Hypothesis 3:** The impact of entrepreneurship education is stronger on the student attitudes towards entrepreneurship compared with other antecedents of entrepreneurial intention (i.e. subjective norms and perceived behavioural control)

### 3. Data and Methodology

#### 3.1. Study design

According to the aim of the study to investigate the link between teaching models and the components of student entrepreneurial intentions, a teaching model framework proposed by Bechard and Gregoire (2005, 2007) is used. This makes it possible to divide a variety of entrepreneurship education programmes (courses) into groups based on supply, demand, competence and university support teaching models. This classification of teaching models

is for the most part in line with the proposal by Bechard and Gregoire (2007), but is adjusted according to the classification of the empirical survey carried out (GUESSS). In the opinion of the authors, it also suits the actual situation of the content and pedagogy used in entrepreneurship education in the selected countries.

In the current research the *supply model* is understood according to the proposal by Bechard and Gregoire (2005, 2007) consisting of traditional lectures, reading and watching/listening methods of learning, except in courses on business planning (Table 1). The latter consists of the *demand model* together with business idea contests, because nowadays in most cases business planning courses include a personalized approach to learning and students participate in exploration, discussion and experimentation, culminating in business idea contests. The *competence model* according to Bechard and Gregoire (2005, 2007), focuses on active problem solving in real-life situations supported by communications and discussions with mentors, investors and other stakeholders in a business support network. The fourth model includes different university support resources and is called the *context support model*. This classification of entrepreneurship education programmes (courses) serves as the basis of the logistic regression.

**Table 1.** Teaching model framework and models for analysis

Teaching model	Entrepreneurship courses	Models for logistic regression
<i>Supply model</i>	Entrepreneurship in general; family firms; financing entrepreneurial ventures; technology entrepreneurship; social entrepreneurship; entrepreneurial marketing; innovation and idea generation	II, VII, IX,
<i>Demand model</i>	Business planning; business plan contests	V, XII
<i>Competence model</i>	Workshops/networking with experienced; contact platforms with potential investors; mentoring and coaching programmes for entrepreneurs; contact point for entrepreneurial issues	III, X
<i>Context support model</i>	Technology and research resources (library, web); Seed funding/financial support from university	IV, XI

*Note:* Model I, VI and VIII include all teaching models expressing all four teaching models

*Source:* Authors' calculation

In this study, it is assumed that students have attended at least one of each of the entrepreneurship education programmes (courses). The division of programmes into four models makes it possible to analyse the most effective methods of entrepreneurship teaching in terms of student entrepreneurial intention and its antecedents.

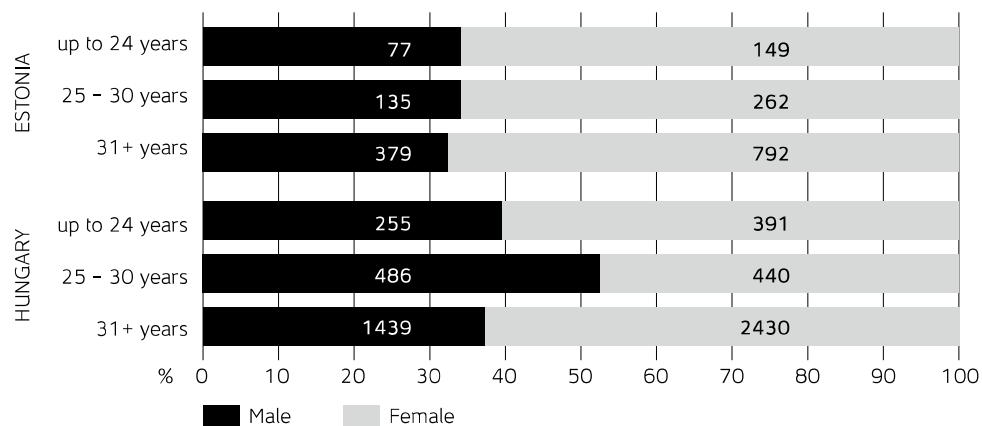
### 3.2. Sample characteristics

The secondary data were obtained from the Global University Entrepreneurial Spirit Student Survey (GUESSS). This is a research project about student entrepreneurial intentions and the activities of students in different countries around the world as well as about university offerings related to the entrepreneurship education of their students. The survey wave took place in 2011 and 26 countries participated. It is difficult to generate a comparable sample across the countries. We focused on the sample from Estonia and Hungary. Similar features of both countries were taken into account to improve the external validity. There are some

specific features: both countries are small, both had been developing a market economy for a short period and both countries are undergoing a transition from an efficiency-driven to an innovation-driven economy. The Bologna process has been introduced and there are similar benefits for Estonian and Hungarian students. In both countries, the need for skilled workforce has increased and quality management has become important because universities are interested in maintaining high standards of higher education. The sample for this study consists of 1,794 Estonian students and 5,441 Hungarian students. Respondents from international institutions of education and those who are already entrepreneurs and were in the past have been excluded from the sample.

As shown in Figure 1, the majority of the students are in the under-25 age category due to the fact that the level of studies is either undergraduate or graduate. Recent decades have been marked by greater growth in the participation of women compared to men in higher education. There is a high participation rate among females in the sample (60 per cent in Hungary and 68 per cent in Estonia). This has the advantage of providing respondents of similar age and gender making the sample more homogeneous.

Figure 1. Age distribution in the sample by gender

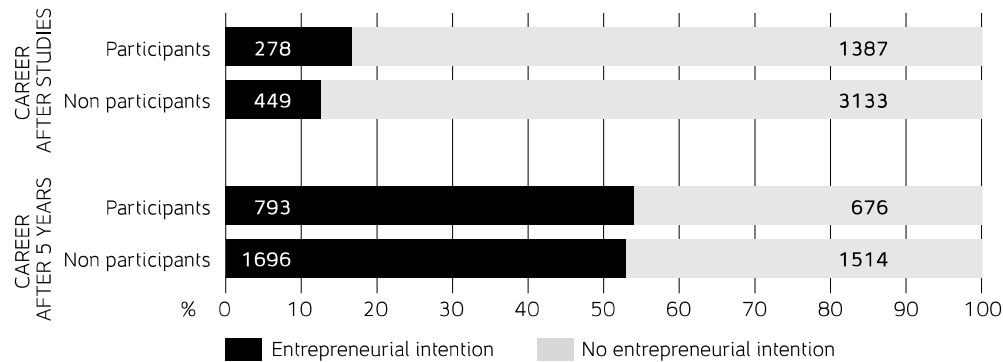


Source: Authors' calculation

Moreover, almost 40 per cent of the students have one or both of their parents currently self-employed or grew up in a family business. Regarding academic background, an average of 80 per cent of the respondents are undergraduate (bachelor students) and 20 per cent graduate (master, PhD or postdoc) students. In the sample, 42 per cent of the respondents study business and economics fields, 58 per cent natural and social sciences.

In terms of the entrepreneurial intentions of the students right after studies, around 23 per cent and 15 per cent of the entrepreneurship programme students respectively in Estonia and Hungary intend to found their own business. At the same time, only 14 per cent and 12 per cent of the respondents respectively who did not participate in the entrepreneurship programme intend to be a founder. It is interesting to note that five years after completing their studies there is no clear difference between the entrepreneurial intentions of students according to their participation in the entrepreneurship education programme. As shown in Figure 2, about 54 per cent of the students who participated in the entrepreneurship programme intend to found their own business and 53 per cent of non-participants.

**Figure 2.** Percentage of participants in an entrepreneurship programme and non-participants who intend to found their own business



Source: Authors' calculation

### 3.3. Variables

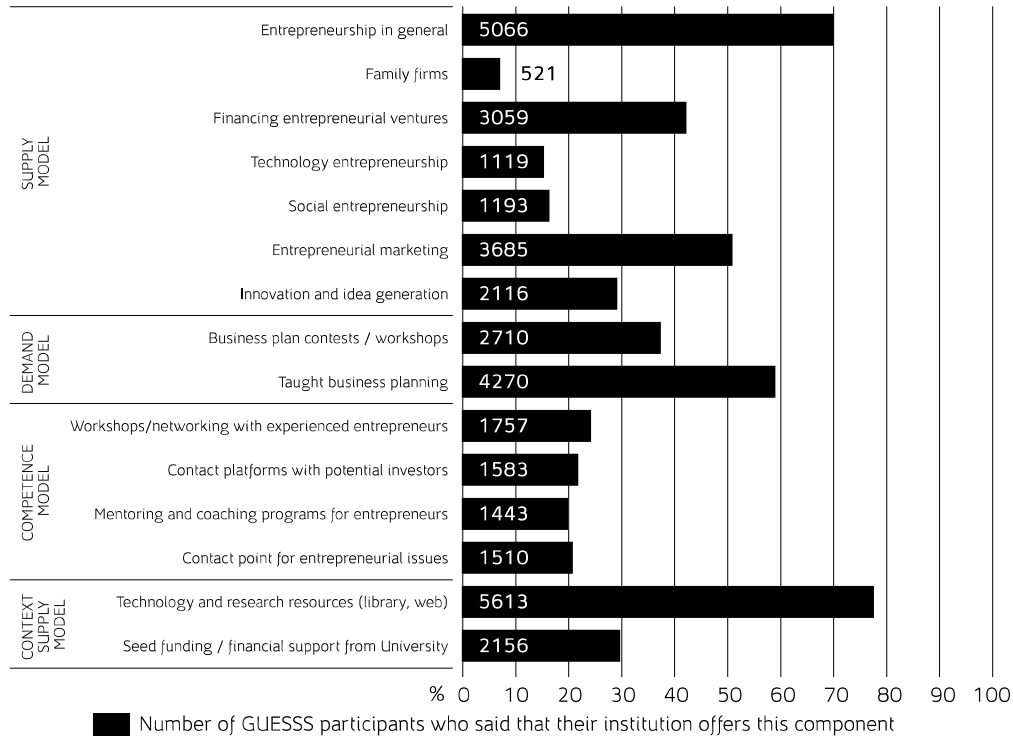
#### Dependent variable

Answers to the question “Which career path do you intend to pursue right after studies and 5 years after completing your studies?” were used to construct the dependent variables. In the questionnaire, an intention was based on 4-item measures: employee, founder, successor and others. In this study, the independent variable is a dummy and indicates only whether the student has an intention to be a founder instead of an employee (the variable's value is 0 if the respondent intends to be an employee and 1 if the respondent intends to be a founder). Meanwhile, there are two dependent variables: entrepreneurial intention right after studies and five years after completion of studies.

#### Independent variables

Regarding the first component as *supply model* (i.e. traditional lectures and seminars), almost 70 per cent of the students have underlined that their university offers the course as Entrepreneurship in general (Figure 3). This can be explained by the fact that this was probably a compulsory course in most fields dedicated to increasing student awareness about entrepreneurship and to highlight the entrepreneurial path as a viable career option (Fayolle and Gailly, 2015). This is also supported by two aspects. First, the structure of the sample has a large proportion of bachelor students, where general courses are in demand. Second, the context of the sample countries with their recent transition to a market economy, where increasing the general awareness of entrepreneurship is justified. With regard to the *demand model* (business planning courses and business idea contests), 59 per cent of the respondents believe that their university offers business planning contests/workshops. It is interesting to note that only 20 per cent of the students find that interaction with the *competence model* (workshops/networking with experienced entrepreneurs or coaching programmes) is offered by their institution. Finally, around 80 per cent of the students state that their university offers the creative atmosphere: technology and research resources such as library or web, and 30 per cent of them find that their university provides financial support to student teams. These two items form the context for the support model.

**Figure 3.** University entrepreneurship education courses and teaching models in higher education in Estonia and Hungary according to the awareness of survey participants



Source: Authors' calculation

In this study, the independent variable is participation in entrepreneurship education programmes (EEP). This variable is a dummy with value one if students have attended at least one of the offered components. Otherwise, the value is zero if the respondent did not participate in any entrepreneurship university offerings. In addition, according to the four categories, the influence of different teaching models (supply, demand, competence and context support model) are examined.

### Control variables

We control for variables that are related to entrepreneurship education as social and demographic variables. One of the control variables is age. This variable is continuous. We include also gender; this takes one for female and zero for male. We include dummies for country (one: Estonia; zero: Hungary), field of study (one: Business and Economics (management/business administration, economics; zero: social sciences/natural sciences (medicine/health sciences, mathematics/natural sciences, engineering, architecture, computer science etc.), educational level (one: bachelor; zero: master, PhD, or other), type of university (one: university; zero: university of applied science), family business (zero: no family business background; one: raised in a family business). Having self-employed parents can influence the intention or the actual decision to become an entrepreneur (Parker and van Praag, 2012, Verheul et al., 2012).

## Mediators

According to the Theory of Planned Behaviour, the following three predictors together shape an individual's behavioural intention: attitude towards behaviour, subjective norms and perceived behavioural control (Table 2). In this paper, all three mediators are applied to the field of entrepreneurship. All mediators have been calculated as an average of several sub-questions.

**Table 2.** Mediators: average score, standard deviation and Cronbach's alpha

	No of items	Average score	SD	Cronbach's alpha
Attitude towards entrepreneurship (ATE)	4	4.61	0.14	0.93
Subjective norms (SN)	3	5.62	0.05	0.89
Perceived behavioural control (PBC)	12	4.62	0.57	0.89

Source: Authors' calculation

The attitude towards entrepreneurship (ATE) corresponds to the degree to which the student has positively or negatively valued the option to become an entrepreneur compared to other occupational options. The ATE measure is in line with Linan and Chen (2006). In this study, four different statements about being an entrepreneur are included (e.g. advantages of and satisfaction from being an entrepreneur, attractiveness of this career). The answers to the questions are registered using a seven-point Likert scale (one=strongly disagree to seven=strongly agree).

Subjective norms (SN) indicate a respondent's perception about being an entrepreneur, which is influenced by the judgment of important people. Three statements are used to show how much the student cares about the opinion of parents, friends/fellow students and other important people. The answers to the questions have also been registered using a seven-point Likert scale (one=very negatively to seven=very positively).

Perceived behavioural control (PBC) refers to the perceived ease or difficulty of becoming an entrepreneur and successfully managing a business. The respondents were asked to indicate their level of competence with twelve different tasks (developing new products and services, making decisions under uncertainty and risk, managing time by setting goals, etc.). The answers to the questions have also been registered using a seven-point Likert scale (one=very low competence to seven=very high competence).

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## 3.4. Analysis

A reliability analysis, and correlation, univariate and multivariate analyses are applied using the statistical package for the social sciences (SPSS). Binomial logistic regression analysis in the case of categorical dichotomous variables was selected as a multivariate technique for the analysis. Odds ratio must be interpreted as how more or less likely it is for the event of interest expressed in the dependent variable to occur by the fact of having the characteristic that contains the independent variable (one) versus not having it (zero), whichever is greater or less than one, respectively. If it is exactly equal to one, the independent variable in question does not exert any influence on the dependent variable. In addition, the Variance Inflation Factor (VIF) is calculated, which is between 1 and 2.3. This value is below the critical cut-off 10 (Hair et al., 2006), suggesting that multicollinearity is not a cause for concern. In all

models the Hosmer-Lemeshow test was conducted and its significance  $> 0.05$  implies good calibration of the model. Cronbach's alpha values are above 0.80, indicating that the measures are reliable and acceptable. In order to investigate the difference between variables the appropriate tests were performed. The Chi-square test was applied in the case of two categorical variables from the sample. It is used to determine whether there is a significant association between the two categorical variables. An independent samples t-test analysis is appropriate for comparing the means of the two groups.

## 4. Results

Before estimating a binary logistic model, we assessed how entrepreneurship education programmes in universities influence entrepreneurial intentions immediately after and five years after graduation. This analysis of courses and services provided by institutions of higher education can be useful in understanding the start-up decisions of students. Table 3 reports the Pearson Chi-Square statistics for the two post-transition countries and gender subgroups.

**Table 3.** Association of participation in different courses of an entrepreneurship education programme and entrepreneurial intention immediately after and five years after studies

Entrepreneurship Education programmes (courses)	Right after studies			Five years after studies		
	Sample	Male	Female	Sample	Male	Female
Entrepreneurship in general	8.26***	14.92***	0.1	28.62***	20.52***	10.65***
Family firms	0.00	0.11	0.12	0.03	0.25	0.04
Financing entrepreneurial ventures	0.52	1.85	0.11	8.5***	4.49*	3.89*
Technology entrepreneurship	3.01*	5.47*	0.01	1.37	0.11	1.82
Social entrepreneurship	2.45	1.06	1.35	4.97**	0.08	6.88***
Entrepreneurial marketing	19.54***	18.46***	3.78*	17.5***	14.39***	5.49**
Innovation and idea generation	8.72***	7.33***	1.85	9.99***	6.54**	3.66*
Business planning	17.00***	18.48***	2.95*	18.16	12.77***	7.35***
Workshops/networking with experienced entrepreneurs	3.41*	1.19	1.86	6.71**	4.76**	1.95
Contact platforms with potential investors	1.07	3.71*	0.49	0.24	1.94	0.42
Business plan contests / workshops	18.84***	15.87***	3.38*	10.29***	2.09	7.62***
Mentoring and coaching programs for entrepreneurs	11.36***	6.03**	5.31*	0.98	0.03	1.33
Contact point for entrepreneurial issues	10.28***	4.79**	5.46*	5.21**	1.42	2.52
Technology and research resources (library, web)	0.86	3.16*	0.06	3.24*	7.26***	0.03
Seed funding / financial support from University	0.03	2.28	2.03	1.81	0.73	1.07

Notes: the Pearson Chi-Square is presented in the columns; \*\*\*: p-value less than 0.01; \*\*: p-value less than 0.05; \*: p-value less than 0.10.

Source: Authors' calculation

In particular, the results from the whole sample suggest that there is a significant difference between participation in traditional general courses (Entrepreneurship in general, Entrepreneurial marketing, Innovation and idea generation) and entrepreneurial intention immediately after and five years after studies. This shows that traditional lectures with professors at the head of the class still dominate (proved by the highest ratio of awareness of students in the sample). This can also be explained by the context of these countries and that a considerable proportion of the participants in the survey are bachelor students. It may be that a considerable proportion of the students may not have participated in entrepreneurship courses at lower levels of education and at the bachelor level they are obtaining their first knowledge about entrepreneurship through traditional lectures and seminars. Since the p-value is less than the significance level (0.1), we also conclude that there is a relationship between the new practice of workshops and an entrepreneurial career in the selected countries immediately after and five years after studies. It may be clearly seen from Table 3 that there is also a significant contribution from new learning methods to entrepreneurial intention (e.g. mentoring and coaching programmes for entrepreneurs) immediately after their studies. No significant differences could be detected in terms of university support (technology and research resources, seed funding/financial support from university) between higher education institutions in post-transition countries, which is in line with the previous research by Morris et al. (2017).

It is also noteworthy that there is a clear gender difference in terms of intentions. Gender differences in intentions were detected in terms of social entrepreneurship five years after studies. Women tend to pursue this role in a more social setting; for example, by becoming a social entrepreneur or by making an entrepreneurial contribution in the public sector (Bosma et al., 2016). These findings indicate that in general, females may be more interested in making positive changes in their world through social entrepreneurship.

In order to investigate the difference between participants and non-participants in entrepreneurship education programmes (EEP) and entrepreneurial intentions (attitude towards entrepreneurship, subjective norms and perceived behavioural control) the independent samples t-test was performed. The results show a significant difference between subjective norms and participation in EEP for females ( $t=2.95$ ,  $p\text{-value}=0.007$ ). The social pressure from family, friends or significant others for female participants ( $M=5.75$ ,  $SD=1.08$ ) is higher compared to non-participants ( $M=5.63$ ,  $SD=1.09$ ). Women's perception about being an entrepreneur, which is influenced by their judgment of important people, is significantly higher than among men ( $M=5.64$ ,  $SD=1.08$ ). Depending on the social environment, these pressures can become a barrier to the development of an entrepreneurial career for female students.

Next, a binary logistic regression analysis was conducted to test the relationship between dependent variables (the students' entrepreneurial intention immediately after and five years after graduation) and the selected independent and control variables and mediators. More specifically, we entered the variables in two blocks, starting with the independent variable and the controls, and finally entering the mediators. As a set of variables is added to the model, their contribution to the improvement of the model is reflected in a significant increase in model fit (reduction in the -2 Log-Likelihood Chi-square tests). The regressions show the odds ratios associated with the estimated coefficients, as well as the significance for each coefficient, and the standard error, which are presented in Table 4. Control variables are included in the models but the results are not presented in Table 4. Overall, the effects of the

control variables related to entrepreneurship education and demographic variables are in line with previous research.

As depicted in Table 4, entrepreneurship education through participation in an entrepreneurship education programme had a positive effect on entrepreneurial intention immediately after studies (model I:  $B=0.258$ ,  $p<0.05$ ). Participants in the entrepreneurship education programme (EEP) are more likely to intend to start their own business directly after studies compared to non-participants ( $r=0.056$ ,  $p<0.05$ ). The 1.29 odds ratio for EEP indicates that the odds for participating in the entrepreneurship education programme are 1.29 times higher than for non-participants. Table 4 also shows that attitudes towards entrepreneurship (ATE) has a positive and significant effect on entrepreneurial intentions immediately after and five years after studies. A more favourable attitude towards entrepreneurship increases the probability of becoming an entrepreneur by two times (Model I: odds ratio=1.78; Model VIII: odds ratio=2.15). The effect of subjective norm (SN) is in the opposite direction. As can be seen from Table 4, subjective norm indicates a negative and significant effect on the probability of being a founder immediately after and five years after studies. The subjective norm indicates much lower support in their immediate environment (i.e. the opinion of parents, friends/fellow students and other important people). The last mediator, perceived behavioural control (PBC), is positive and significant only for an entrepreneurial intention directly after studies. We conclude that the attractiveness of being a founder is the most important predictor of entrepreneurial intention immediately after and five years after completing studies.

The results provide empirical support for the arguments that students who grew up in a family business and have a bachelor degree with a strong positive attitude towards entrepreneurship are likely to be more interested in becoming a founder, and being female decreases the probability of having entrepreneurial intentions. According to the GUESSS report (Sieger et al., 2011), business and economics students (from a sample of 26 countries) can be classified as the most entrepreneurial students. Contrary to expectations, students from natural and social sciences are more likely to intend to start their own business directly after their studies compared to non-participants in the selected transition countries. Note that there is a clear difference between student entrepreneurial intentions right after studies.

In order to compare the influence of different teaching models on student entrepreneurial intentions and its components (ATE, SN, PBC), we test each teaching model in the entrepreneurship education programme entering the variables separately into the models – the results are shown in Table 4 (description of the models in Table 1). The statistics clearly show the positive and significant effect on entrepreneurial intention immediately after and five years after studies only for the *supply model* (traditional lectures and seminars) (Model II: odds ratio= 1.24; Model IX odds ratio=1.288). The main explanation for this could be the actual situation in universities, where the supply model prevails among university offerings, and the high awareness of students in all fields of general entrepreneurship courses (around 70 per cent) in this survey. This mainly characterises the situation at the bachelor level of studies (i.e. 80% of respondents in the survey). The survey results establish that there is a strong link between entrepreneurial intention right after studies, and the *demand model* including business planning workshops, generating a business idea and participating in business idea contests. The odds ratio is 55 per cent higher for participants in the *demand model*. At the same time, the estimated interaction between the *supply* and *demand models* was significant and positive (Model VII:  $B=0.5$ ,  $p<0.001$ , Odds ratio=1.649). Therefore, if

students participated in a business planning course, this increased the positive impact that student involvement in general courses had on entrepreneurial intention. Assessing the validity of the hypotheses, the results of the analysis confirmed all three hypotheses, so the most influential teaching models are *supply model* and *demand model* and attitudes towards entrepreneurship were most affected by entrepreneurship education compared with other antecedents of entrepreneurial intention. We can summarize that the combination of a business planning course (incl. active learning, learning by doing) and traditional lectures and seminars can be classified as the most influential method (i.e. *supply* and *demand model*) of learning in the conditions of the survey sample and selected country context. At the same time, the influence of the *competence model* and the *context support model* is not visible probably because of their quite moderate representation in the teaching model framework. This shows the state of entrepreneurship education mostly at the bachelor level of education in Estonia and Hungary (because 80% of the sample are bachelor students).

Regarding the predictors of entrepreneurial intentions and their link between different teaching models it can be concluded that entrepreneurial intention is influenced mostly through the *supply* and *demand models* of entrepreneurship education right after studies and five years after studies. While attitudes towards entrepreneurship have the strongest and most positive effect from the *supply* and *demand models*, by contrast, subjective norms show a negative and significant effect on the probability of being a founder immediately after and five years after studies. Perceived behavioural control is only positive and significant for entrepreneurial intentions directly after studies. The impact of entrepreneurship education on the mentioned components of entrepreneurial intention is quite moderate but seems similar in all teaching models.

As a robustness check, we investigate whether the results are the same for male and female students. The smaller sample size may account for the lower presence of significant variables. The results are confirmed using different robustness tests and are in line with the abovementioned results but are not significant for females. However, some differences do exist. In the female sample, master or PhD students are more likely to have entrepreneurial intentions than students from the male sample. In particular, males who participated in traditional courses, business planning workshops and studied other fields than business and economics are more likely to have higher entrepreneurship intentions right after studies than non-participants. There was a positive significant effect in terms of age, family business, ATE and PBC for males and females. Older students who grew up in a family business with strong positive attitude towards entrepreneurship and high self-efficacy are more likely to choose to be a founder. The subjective norm has a negative effect showing much lower support in their immediate environment. Finally, as the country dummy had significant contributions that explain intentions, we have also reproduced the analysis for each country. However, the smaller sample size for Estonia accounts for the lower presence of significant variables.

**Table 4** Logistic regression: Effect of participation in different components of an entrepreneurship education programme on entrepreneurial intentions immediately after and five years after studies

	Right after studies							Five years after studies				
Components	Model I B (SE)	Model II B (SE)	Model III B (SE)	Model IV B (SE)	Model V B (SE)	Model VI B (SE)	Model VII B (SE)	Model VIII B (SE)	Model IX B (SE)	Model X B (SE)	Model XI B (SE)	Model XII B (SE)
EEP	0.258** (0.102)							1.07 (0.059)				
Odds ratio	1.29							1.06				
Supply model		0.217* (0.13)				0.094 (0.22)	0.07 (0.172)		0.253*** (0.094)			
Odds ratio		1.24				1.09	1.07		1.288			
Compe- tence model			0.12 (0.145)			-0.015 (0.186)				0.092 (0.118)		
Odds ratio			1.128			0.99				1.096		
Context support model				0.068 (0.138)		-0.181 (0.232)					-0.044 (0.1)	
Odds ratio				1.07		0.83					0.96	
Demand model					0.438*** (0.116)	0.416** (0.179)						0.12 (0.093)
Odds ratio					1.55	1.52						1.127
Supply x Demand							0.5*** (0.133)					
Odds ratio							1.649					
<b>Mediators</b>												
ATE	0.578*** (0.052)	0.585*** (0.057)	0.599*** (0.078)	0.543*** (0.057)	0.605*** (0.064)	0.583*** (0.096)	0.605*** (0.066)	0.76*** (0.04)	0.777*** (0.041)	0.748** (0.056)	0.77*** (0.041)	0.839*** (0.046)
SN	-0.178*** (0.057)	-0.172*** (0.061)	-0.23*** (0.085)	-0.162*** (0.063)	-0.155** (0.069)	-0.204* (0.103)	-0.14* (0.071)	-0.08* (0.04)	-0.087* (0.046)	-0.104* (0.063)	-0.073 (0.046)	-0.168*** (0.051)
PBC	0.275*** (0.061)	0.299*** (0.067)	0.339*** (0.091)	0.307*** (0.069)	0.319*** (0.075)	0.348** (0.11)	0.29*** (0.076)	0.00 (0.05)	0.024 (0.051)	0.105 (0.071)	0.006 (0.052)	0.039 (0.057)
<b>Control variables</b>												
N	4241	3708	2077	3621	3136	1598	2979	3783	3298	1832	3214	2778
Log- likeli- hood	2807.75	2463.35	2463.35	2354.09	2041.35	1026.18	1936.2	4290	3732.54	2092.09	3670.35	3100.01
Pseudo R2	0.19	0.191	0.191	0.171	0.203	0.19	0.2	0.29	0.295	0.285	0.287	0.31
<b>Hosmer-Lemeshow goodness fit of test</b>												
Chi- square	4.5	4.23	3.83	7.08	7.61	16.72	10.67	17.19	18.16	6.31	12.00	17.22
Sig	0.8	0.84	0.87	0.53	0.47	0.03	0.2	0.028	0.02	0.61	0.15	0.03

Notes: \*\*\*: p-value less than 0.01; \*\*: p-value less than 0.05; \*: p-value less than 0.10. SE: standard errors.  
EEP: entrepreneurship education programme

Source: Authors' calculation

## 5. Discussion and conclusions

According to the aim of the study, the impact of entrepreneurship education programmes on student entrepreneurial intentions are evaluated in countries with a relatively short history of transition towards a market economy. To fill the research gap, a teaching model framework was compiled based on the concept presented by Bechard and Gregoire (2005, 2007) and adjusted according to the country context. Four teaching models are identified (*supply*, *demand*, *competence* and *context support models*). This framework differs from the initial model of Bechard and Gregoire in the content of the *demand model* (including business planning courses and business idea contests) and the *context support model* (including technology, research and financial support). In the opinion of the authors, the established structure of the teaching model framework in the current study is better aligned with the context of the selected countries.

The conclusion from the current survey is that the teaching model framework proposed by Bechard and Gregoire (2005, 2007) is valuable for the analysis of a variety of entrepreneurship education programmes, but the framework does need to be adjusted according to the real-life situations in the relevant context. The current research proposes an adjusted teaching model framework for countries with a short history along the path towards a market economy. In this context, business planning courses together with business idea contests fit the requirements of the *demand model*, where teachers are conceived as “facilitators” and “tutors” and students are active participants in their learning. The *context support model* (including technology, research and financial support) – instead of hybrid models in the initial literature source (Bechard and Gregoire, 2005, 2007) – is proposed because of the author’s interest in finding out how students assess the importance of university support in terms of technology and research resources and seed funding/financial support. However, in other cases these components of entrepreneurship education may also be included in the *competence model*.

The current research also showed that the importance of using different teaching models differs depending on the students’ study level and country context regarding the content of study needs. Relying on the sample of respondents in the current research, we suggest that as not all bachelor students starting their studies in university have learned entrepreneurship at lower levels of education (this is the case in the selected countries) need first introduction knowledge about entrepreneurship and interested more in traditional courses. The other issue is that very often universities offer traditional courses based on passive learning methods. However, it is still possible to make these courses more attractive and include active learning methods. Nowadays, the situation is changing, and according to the authors’ experience, more universities are starting to use active learning approaches in entrepreneurship education. Unfortunately, often in large surveys, where many countries are involved, information about the content of the courses and pedagogical activities are missing in the database. Therefore, in any case the assessment and classification of programmes may to a certain extent be approximate. The differences of the countries in the current research is explained by the fact that the change in the entrepreneurial mindset of a population is a long-term task and this is a challenge for countries in the transition to a market economy, where the contribution of the education system is of high importance.

The current research is among the few focusing on the identification of a link between entrepreneurship education teaching models and student entrepreneurial intentions and its

antecedents. The fact that the most influential teaching models are the *supply model* and the *demand model* means that the combination of business planning courses (including active learning, learning by doing) and traditional lectures and seminars can be classified as the most influential method in the conditions of the survey sample and context of the selected countries. Therefore, the survey results characterise to a large extent the impact of entrepreneurship teaching models on student entrepreneurial intentions in the selected countries, Estonia and Hungary. It shows the state of entrepreneurship education mostly at the bachelor level of education. It is expected that similar trends may also be applied in other countries with a similar history and sample structure, but future research is needed to confirm that proposition.

The most important result from this research is that attitudes towards entrepreneurship (ATE) were most affected by entrepreneurship education compared with other antecedents of entrepreneurial intentions in the short and long term. The attitude towards entrepreneurship is supported most by the *supply* and *demand models* of teaching. This result was anticipated considering the characteristics of the survey respondents and the country context. At the same time, the influence of the *competence model* and the *context support model* is not visible probably because of their quite moderate representation in the teaching model framework and because of the influence of the country context. Considering the other components of entrepreneurial intention, the study showed a negative and significant effect on subjective norms. It can be concluded that according to the results of the current study, the wide variability of entrepreneurship education programmes had no power to affect the subjective norms (SN) of students, and the perceived social pressure from family, friends and significant others have a strong and stable influence on student entrepreneurial intentions. According to the self-assessment of students, perceived behavioural control (PBC) is only positive and significant for entrepreneurial intentions right after studies. Here, the impact of entrepreneurship education is quite moderate on components of entrepreneurial intention such as subjective norms and perceived behavioural control, and seems similar for all teaching models. These results suggest the need for a deeper analysis of the reasons for the different impact of entrepreneurship education models on student entrepreneurial intention components in different contexts.

The conclusion to be drawn is that the offerings of higher education institutions play a significant role in student entrepreneurial intentions and their antecedents. The research contributes to theory and practice in relation to the impact of entrepreneurship education on student entrepreneurial intentions. The contribution to the literature includes a proposal to adjust the teaching model framework to suit the country context, as well as the impact assessment of teaching models to different components of student entrepreneurial intentions in the short and long term. The practical contribution is directed to policy makers and entrepreneurship education programme leaders. First, the result that entrepreneurship education plays a significant role in entrepreneurial intentions rather in the short-term than in the long-term perspective suggests a re-evaluation of teaching models, and greater use of the *competence model* of teaching could result with an increase in the extent of the impact on the longer term. The study results also support paying more attention to offering entrepreneurship courses to students with different characteristics (e.g. study field, gender, prior experience etc.). Considering the importance of entrepreneurship in the development of the economy, the current survey contributes to a better understanding of the impact of entrepreneurship education on student entrepreneurial intentions, which is valuable for educational institutions wanting to know how to develop entrepreneurship education in the future.

### Limitations and future research

The study has some limitations. The first limitation is its reliance on self-reported data. Previous TPB applications show that the intention-behaviour link is stronger in studies using self-reported data (Kautonen et al., 2015). Secondly, we studied university students, which limits the applicability of our results to other groups. Then, the survey data did not track the respondents' entrepreneurial behaviour before and after entrepreneurship education programmes. Lastly, we studied students only in two Central and Eastern European countries, which participated in the GUESSS survey. In the structure of the sample, most of the respondents had studied at the bachelor level, and the results of the survey characterise bachelor students to a considerable extent. This situation did not make it possible to study all groups of students with similar reliance. Hence, the conclusions cannot be generalized and should be interpreted in the Estonian and Hungarian context, and can at most be stretched to the Central and Eastern European context. In the future, we recommend studies based on larger datasets from more countries, as well as studying the impact of entrepreneurship education programmes on student entrepreneurial intentions before and after the programme and considering different factors of influence. Other groups could also be studied (e.g. students in other educational levels, age groups).

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